

ENGINEERING PLANNING SURVEYING CERTIFICATION ABN 26 134 067 842

Our Ref:CC200001

16 June 2021

General Manager Northern Beaches Council PO Box 82 MANLY NSW 1655

Attention: Rod Piggott and Adam Mitchell

Dear Sir / Madam,

#### Development Application DA2021/0359 – Additional information for Mona Vale Public School

I reference the abovementioned development application, correspondence dated 19 May 2021 signed by Rod Piggott and discussions with Staff and members of NSW School Infrastructure on Monday 31 May 2021.

Following these discussions and review of the internal Council referrals, the following information has been provided to assist with the assessment of the application.

- Updated plant schedule by Arcadia (Drawing No L-400 Issue F) dated June 2021,
- Proposed Tree Canopies by Arcadia (Issue E) dated June 2021,
- Arcadia Cover letter detailing the proposal details, dated 15 June 2021, and
- Flora and Fauna Assessment Report by Narla (Dated June 2021).

In terms of the justification of the proposal and its location on the school site, a number of options were investigated in relation to location and position of new buildings on the site. The discussions in relation to building location considered the following:

- Overland flow paths,
- Provision of active and passive play spaces,
- Access to the school and in particular the administration sections,
- School security,
- Trees and vegetation,
- Equitable access for all abilities for students, parents, staff and teachers,
- Parking and accessibility,
- School operations, and
- Condition of existing buildings.

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The proposed location of the building that requires the tree removal was considered the most appropriate for the following reasons:

- It provides a secure access, compliant with NSW Department of Education design guidelines, security standards and passive design principles from the main gate through to new administration. This is essential for school design and safety moving forward.
- It maintains the main cleared area of the playground for active play space. This is currently the only open flat space on the main school grounds.
- Building G, which is proposed to be demolished to make way for the new building does not meet current EFSG standards and is needing to be replaced.
- The school is currently over a number of levels and there is not equitable access for all abilities to a number of areas of the school. The proposed building permits this access for all abilities without creating specialised ramps and significant level changes in the landscape. These changes if required could also require the removal of vegetation to achieve appropriate accessibility.
- The site is quite heavily vegetated and it is difficult to find a site for a new building where no trees would be required to be removed or impacted.

Further the tree canopy was considered by the landscape architects, Arcadia for the site. The canopy cover of the proposed tree removal is 2,047m<sup>2</sup>. However as shown on the plan, tree planting as part of early works and the proposal will increase the canopy to 2,560m<sup>2</sup>, which is about an additional 513m<sup>2</sup> of tree canopy. This will include a number of mature trees which are shown on the Tree canopy plan included with this letter.

Further to support the application a flora and fauna assessment was undertaken by Narla and is included with this letter. It concludes as follows:

This assessment indicates that the relevant biodiversity conservation provisions of the Environmental Planning and Assessment Act 1979 and the relevant provisions of the PLEP and the PDCP have been fulfilled.

No threatened ecological communities, fauna or flora species or populations are expected to be significantly impacted as a result of the proposed development.

In summary, the proposed development will require the removal of twenty-six (26) trees of which three (3) are listed as an 'Exempt Tree Species' within the Northern Beaches LGA (Northern Beaches Council 2015). The revegetation of the Subject Property will involve the planting of forty-two (42) native tree species resulting in a net gain of native tree species abundance. Revegetation works will also include the planting of numerous shrub and groundcover species (Appendix C), vastly improving the biodiversity of the Subject Property. The proposed planting schedule will also result in a net gain of food resources for the Grey-headed Flying Fox within the Subject Property.

If the appropriate recommendations in this report are followed, the proposed development will have minimal ecological impacts.

Following from the above, the proposed tree removal is supportable and will provide an overall public and ecological benefit following from the additional planting and new school buildings.

Should you have any questions or require further information, please contact me on email <u>lisa@brs.com.au</u> or phone 0409 681669.

Yours faithfully,

Lisa Wrightson | Planning Manager Barker Ryan Stewart Pty Ltd

# 20-716 MONA VALE PUBLIC SCHOOL PLANT SCHEDULE

\_\_\_\_\_

	CODE	BOTANIC NAME	COMMON NAME	MATURE SIZE (h x w) (m)	PROPOSED POT SIZE	QUANTITY
$\wedge$		TREES & PALMS	1			
	Bi	Banksia integrifolia	Coastal Banksia	15 x6	200L	10
	Cg	Corymbia gummifera	Red Bloodwood	20 x10	400L	19
	Eh	Eucalyptus haemastoma	Scribbly Gum	15 x 10	400L	7
	TI	Tristaniopsis laurina	Water Gum	7 x 5	400L	6
		ADDITIONAL TREES				
	Up	Ulmus parvifolia	Chinese Elm	13 x 10		1
	Ара	Acer palmatum	Japanese Maple	4x4		2
	Cav	Callistemon viminalis	Bottlebrush	4 x 2	200L	5
			$ \land \land$	$\land$	$\land \land$	$\land$
		SHRUBS & ACCENTS	· · · · · · · · · · · · · · · · · · ·			
	Be	Banksia ericifolia	Heath Banksia	1.5 x 1.5	300mm	20
	Br	Bauera rubioides	River Roses	1 x 1	300mm	176
	Cs	Crowea saligna	Pink Crowea	1 x 0.8	300mm	13
	GI	Grevillea linearifolia	White Spider Flower	2 x 2	300mm	94
	Pm	Philotheca myoporoides	Long-leafed Wax Flower	2 x 1	300mm	19
	Rs	Rhagodia spinescens	Aussie Flat Bush	0.3 x 1	300mm	440
	Wf	Westringia fruticosa	Coastal Rosemary	1 x 1	300mm	62
	Zs	Zieria smithii	Sandfly Bush	2 x 1.5	300mm	12
		GRASSES & RUSHES	•			
	Dc	Dianella caerulea	Blue Flax Lilly	1 x 1.5	150mm	646
	Fn	Ficinia nodosa	Knobby Club Rush	1 x 0.8	150mm	142
	Ju	Juncus usitatus	Sedge	1.2 x 0.5	150mm	320
	Lla	Lepidosperma laterale	Sword-sedge	1 x 0.35	150mm	145
	Llo	Lomandra longifolia	Mat Rush	0.6 x 1	150mm	667
	Pa	Poa affinis	Tussock Grass	0.8 x 0.8	150mm	1061
	PI	Poa labillardieri 'Eskdale'	Tussock Grass	0.5 x 0.5	150mm	506
	Та	Themeda australis	Kangaroo Grass	1 x 0.3	150mm	585
		FERNS & CYCADS				
	Aa	Adiantum aethiopicum	Maidenhair Fern	0.8 x 0.9	300mm	189
	Cd	Calochlaena dubia	Soft Bracken Fern	0.6-2m x 0.9-1.5	300mm	728
	Hi	Histiopteris incisa	Bat's Wing Fern	1 x 2	300mm	217
	Pe	Pteridium esculentum	Bracken Fern	0.6-1.5 x 1	300mm	172
		GROUNDCOVERS & CLIMBERS	·	•		
	Ah	Actinotus helianthi	Flannel Flower	0.3 x 0.4	150mm	294
	Bs	Billardiera scandens	Apple Berry	1.5 x 3	150mm	269
	Cas	Centella asiatica	Centella	0.2 x 1	150mm	428
	Car	Clematis aristata	Old Mans Beard/Travellers Joy	0.2 x 2	150mm	483
	Dr	Dichondra repens	Kidney Weed	0.3 x 5	150mm	367
	Ηv	Hardenbergia violacea	False Sarsaparilla	0.2 x 3	150mm	563
	Рр	Pratia purpurascens	White Root	0.2 x 1	150mm	409
	Pa	Pelargonium australe	Native Geranium	0.5 x 0.3	150mm	300
	Wfm	Westringia fruticosa 'Mundi'	Coastal Rosemary	0.5 x 1	150mm	150
	Vh	Viola hederacea	Native Violet	0.2 x 1	150mm	716

Copyright remains the property of Arcadia Design Group Pty Ltd. Use only figured dimensions. Any other required dimensions are to be referred to and supplied by the landscape architect. All discrepancies to be referred to the project manager and Arcadia Design Group Pty Ltd prior to construction. Ensure compliance with the Building Code of Australia and all relevant Australian Standards and Authority requirements.

# F Schematic Design GA AL 15.06.21 ESchematic DesignGAAL10.00.21DSchematic DesignGAAL08.02.21DSchematic DesignGAAL19.01.21ADraft Schematic DesignJFAL11.12.20IssueRevision DescriptionDrawnCheckDate

Not for Construction



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# **Design** Proposed Tree Canopies



Existing trees to be removed. Tree canopy cover = 2,047m2

# ARCADIA

Mona Vale Public School Schematic Design Report



15.06.2021

PROJECT NAME: Mona Vale Public School

Re. Proposed Trees

The Landscape Drawings for the scope of works at Mona Vale Public School show a variety of proposed trees across the site. The design intent was to plant appropriate species to help replace the existing trees lost through the Building works.

The plans show the removal of 7 existing trees along the Waratah Street frontage. Arborist advice states that the construction of the new carpark as well as the movement of supplies and equipment throughout the construction process will be detrimental to the health of these trees. Excavation for the carpark will disrupt the TPZ and structural root zones of these trees, which cannot be minimised due to the strict compliance with DDA accessibility and constraints of the existing RL's along the street frontage. As a result, the cluster will be removed. Replacement trees along this frontage are included in the proposed design to continue the existing language along Waratah Street. Similarly, canopy cover lost in this process will be replaced with proposed trees, in more suitable locations across the Site.

Proposed tree species include: Banksia integrifolia, Corymbia gummifera, Eucalyptus haemastoma and Tristaniopsis laurina. These species are all native and all found in the local area which make them suitable choices.

The proposed species are suitable for a School environment and have been placed at a safe offset from all existing and proposed Buildings. Trees are in areas where they can establish in an unrestricted and healthy manner. Since the species are native, they will require a lower level of maintenance during establishment, however it is assumed that maintenance from a qualified Arborist will be required to monitor the health of trees as they mature, especially for trees in high pedestrian areas.



## Flora and Fauna Assessment Report

Mona Vale Public School Waratah St, Mona Vale NSW 2103

Report prepared by Narla Environmental for

Colliers International on behalf of Schools Infrastructure NSW

June 2021



environmental

Report:	Flora and Fauna Assessment Report – Mona Vale Public School Waratah St, Mona Vale NSW 2103
Prepared for:	Colliers International on behalf of Schools Infrastructure NSW
Prepared by:	Narla Environmental Pty Ltd
Project no:	Coll3
Date:	June 2021
Version:	Final v2.0

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report

Any survey of flora and fauna will be unavoidably constrained in a number of respects. In an effort to mitigate those constraints, we applied the precautionary principle described in the methodology section of this report to develop our conclusions. Our conclusions are not therefore based solely upon conditions encountered at the site at the time of the survey. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. Narla Environmental has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report. For the reasons outlined above, however, no ther warranty or guarantee, whether expressed or implied, is made as to the data, costervations and findings expressed in this report. For the reasons outlined above, however, no ther warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report. For the reasons outlined above, however, no ther warranty or guarantee, whether expressed or implied, is made as to the data, one scepted by Narla Environmental for this project does not constitute an interpretation of the law or provision of legal advice. This report has been developed by a legal professional and the relevant legislation should be consulted and/or legal advice sought, where appropriate, before applying the information in particular circumstances. This report has been prepared on behalf of, and for the exclusive use of, the client who commissioned this report. Narla Environmental expres

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# **Report Certification**

Works for this report were undertaken by:

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### **Document Control**

Revision	Document Name	Issue Date	Internal Document Review
Draft v1.0	Flora and Fauna Assessment Report – Mona Vale Public School Waratah St, Mona Vale NSW 2103	June 2021	Chris Moore
Final v1.0	Flora and Fauna Assessment Report – Mona Vale Public School Waratah St, Mona Vale NSW 2103	June 2021	Chris Moore
Final v2.0	Flora and Fauna Assessment Report – Mona Vale Public School Waratah St, Mona Vale NSW 2103	June 2021	Chris Moore



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# Glossary

Acronym/ Term	Definition		
BAM	Biodiversity Assessment Methodology		
BC Act	New South Wales Biodiversity Conservation Act 2016		
BDAR	Biodiversity Development Assessment Report		
DA	Development Application		
DAWE	Department of Agriculture, Water and the Environment		
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)		
DPI	Department of Primary Industries		
DPIE	Department of Planning, Industry and Environment		
EP&A Act	Environmental Planning & Assessment Act 1979		
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999		
FFA	Flora and Fauna Assessment		
ha	Hectares		
km	Kilometre		
LGA	Local Government Area		
Locality	The area within a 10 km radius of the Subject Property		
m	metres		
mm	millimetres		
NSW	New South Wales		
OEH	Office of Environment and Heritage (now known as the DPIE)		
PLEP	Pittwater Local Environmental Plan 2014		
PDCP	Pittwater 21 Development Control Plan		
SEPP	State Environmental Planning Policy		
SRZ	Structural Root Zone		
Subject Property	Mona Vale Public School Waratah St, Mona Vale NSW 2103		
Subject Site	The development footprint of the proposed development involving, the clearing of 26 and pruning of 4 trees, the construction of two (2) new buildings (Building R and PAC), the demolition of Building I and associated landscaping works.		
Threatened species, populations and ecological communities	Species, populations and ecological communities specified in Schedules 1 and 2 of the BC Act 2016		
ТРΖ	Tree Protection Zone		



## 1. Introduction

#### 1.1 Project Background

Narla Environmental Pty Ltd (Narla) were engaged by Collier International (The Principal Contractor) on behalf of Schools Infrastructure NSW to undertake a Flora and Fauna Assessment (FFA) for the proposed development at Mona Vale Public School 15 Waratah St, Mona Vale NSW 2103 (Lot1 DP 1271246), hereafter referred to as the 'Subject Property' (**Figure 1**). The proposed development involves the removal of 26 and pruning of 4 trees to facilitate the construction of two (2) new buildings (Buildings R and PAC), the demolition of Building I and associated landscaping works, hereafter referred to as the Subject Site (**Figure 1**, **Figure 2**, **Figure 3**).

Narla have produced this report in order to assess any potential impacts associated with the proposed development on terrestrial ecology (biodiversity), particularly threatened species, populations, and ecological communities listed under the Biodiversity Conservation Act 2016 (BC Act) and the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). The report will also recommend appropriate measures to mitigate any potential impacts in line with all relevant State Environmental Planning Policies (SEPP) and local government plans, namely the Pittwater Local Environmental Plan 2014 (PLEP) and the Pittwater 21 Development Control Plan (PDCP).

#### 1.2 Site Description and Location

The Subject Property is approximately 3.59ha and is located within the suburb of Mona Vale which is part of the Northern Beaches Local Government Area (LGA). The Subject Property is a public primary school and as such has a number of buildings, tennis courts, carparks, playgrounds, playing fields, areas of hardstand and assembly halls. The Subject Property has areas of planted canopy generally lacking any mid-storey with an exotic grassy ground layer along with other areas containing landscape plants. The surrounding residential area is dominated by dwellings in an urban landscape.

#### 1.3 Topography, Geology and Soil

The Subject Property has a south-east facing slope with elevations ranging from approximately 16m to 37m above sea level (Google Earth 2021).

The Subject Property is situated over two (2) soil landscapes (Chapman et al. 2009):

- Erina:
  - o Undulating to rolling rises and low hills on fine-grained sandstones and clay stones of the Narrabeen Group. Terrigal Formation of the Narrabeen Group consisting of lithic and quartz sandstone and siltstone, minor sedimentary breccia, claystone and conglomerate.
- Warriewood:
  - Level to gently undulating swales, depressions and infilled lagoons on Quaternary sands.
     Holocene silty to peaty quartz sand. Medium to fine marine sand with podzols.

#### 1.4 Hydrology

No watercourses are present within or adjacent to the Subject Property.





Figure 1. Components of the Subject Property





Figure 2. Site Plan- Proposed (PMDL Architecture and Design 2020).



Figure 3 Tree Location and Management Schedule (Paul Sheering Consulting 2020).



#### 1.5 Relevant Legislation and Policy

The legislation and policy that are addressed in this report are listed in Table 1.

Legislation/Policy	Relevant Ecological Feature on Site	Triggered	Action Required
Environmental Planning and Assessment Act 1979 (EP&A Act)	All threatened species, populations, and ecological communities and their habitat that occur or are likely to occur on the Subject Site during a part of their lifecycle.	Yes	This Flora and Fauna Assessment and all subsequent recommendations relevant to the planning process under 'Part 4 Development assessment and consent'.
Biodiversity Conservation Act (BC Act) (New South Wales)	There were no BC Act listed Threatened Ecological Communities, fauna species or populations identified within the Subject Site during the site assessment. One (1) BC Act listed threatened flora species was identified ( <i>Eucalyptus</i> <i>scoparia</i> ), however, due this species being significantly out of its natural range and its common use in cultivation and landscaping it was excluded from this assessment. This tree is also listed as a 'Exempt Tree Species' within the Northern Beaches LGA (Northern Beaches Council 2015), as such can be removed without consent. It was deemed the proposed development may impact on the foraging habitat of one (1) BC Act listed threatened species (Grey-headed flying fox), as such a '5-Part Test Assessment of Significance' was required for this species.	Yes	This FFA, particularly the likelihood tables for threatened fauna and flora species occurring or potentially occurring within the Subject Site, as well as severity of potential impacts and 5-Part Test of Significance <b>Appendix D</b> .
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (Commonwealth)	No EPBC Act listed threatened fauna species or ecological communities were observed within the Subject Site during the site assessment. One (1) EPBC Act listed threatened flora species was identified ( <i>Eucalyptus</i> <i>scoparia</i> ), however, due this species being significantly out of its natural range and its common use in cultivation and landscaping it was excluded from this assessment. This tree is also listed as a 'Exempt Tree Species' within the Northern Beaches LGA (Northern Beaches Council 2015), as such can be removed without consent. It was deemed the proposed development may impact on the	Yes	This FFA, particularly the likelihood tables for threatened fauna and flora species occurring or potentially occurring within the Subject Site, as well as severity of potential impacts and Assessment of Significant Impact Criteria ( <b>Appendix E</b> ).



Legislation/Policy	Relevant Ecological Feature on Site	Triggered	Action Required
	foraging habitat of one (1) EPBC Act listed threatened species (Grey-headed flying fox), as such a 'Assessment of Significant Impact Criteria' was required for this species.		
Biosecurity Act 2015 (Bio Act)	No priority weeds were identified during site assessment.	No	None
State Environmental Planning Policy (Coastal Management) 2018	The Subject Site does not contain areas mapped within the 'Land Application Map' of this SEPP.	No	None
State Environmental Planning Policy (Koala Habitat Protection) 2021	This SEPP applies to LGA's listed in 'Schedule 1' of the SEPP, where no approved Koala Plan of Management for the land exists and has an area greater than 1ha (including adjoining land within the same ownership). The Northern Beaches LGA is listed in 'Schedule 1' of the SEPP and has a land area greater than 1ha.	Yes	Information prepared for this report. Northern Beaches Council to decide if a Koala Assessment report is required.
State Environmental Planning Policy No 19— Bushland in Urban Areas	The Subject Site does not contain, nor is adjoining, any land zoned or reserved for public open spaces; therefore, SEPP 19 does not apply.	No	None.
Water Management Act 2000	The Subject Site does not occur on waterfront land, therefore the Water Management Act 2000 does not apply.	No	None.

#### 1.6 Biodiversity Assessment Pathway

The requirements of the BC Act 2016 and Biodiversity Conservation Regulation 2017 are mandatory for all Development Applications (DA) assessed pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) submitted in the Northern Beaches LGA.

The BC Act and its regulations stipulate clearing 'area threshold' values (**Table 2**) that determine whether a development is required to be assessed in accordance with the 'Biodiversity Offset Scheme' (BOS). Minimum entry thresholds for vegetation clearing depend on the minimum lot size (shown in the Lot Size Maps made under the relevant Local Environmental Plan [LEP]), or actual lot size (where there is no minimum lot size provided for the relevant land under the LEP).

As no lot size has been prescribed by the PLEP the actual lot size is approximately 3.59ha. To avoid triggering the Biodiversity Offset Scheme, the proponent must avoid the clearing/management of native vegetation in excess of 0.50ha. This proposes development proposes the clearing of approximately 0.22ha of native vegetation.



Table 2. Biodiversity offset scheme entry thresholds. Bold indicates the threshold relevant to this report.

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

The Subject Site does not contain land mapped as 'Biodiversity Values' within the Biodiversity Values Map (DPIE 2021a), and the threshold for clearing is greater than the proposed clearing area, therefore:

- The BOS is not triggered;
- The Biodiversity Assessment Method (BAM) does not apply;
- An Accredited Assessor is not required to prepare a Biodiversity Development Assessment Report (BDAR); and
- No offset credit calculations are required.

As such, a standard Flora and Fauna Assessment Report (this report) has been produced to assess the impact of the proposed DA.

#### 1.7 State Environmental Planning Policy (Koala Habitat Protection) 2021

The State Environmental Planning Policy (koala Habitat Protection) 2021 (the SEPP) aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range, and reverse the current trend of koala population decline by:

- requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat; and
- encouraging the identification of areas of core koala habitat; and
- encouraging the inclusion of areas of core koala habitat in environment protection zones.

The SEPP applies to land, if:

- The lands local government area is listed in Schedule 1 of the SEPP:
  - 0 The Northern Beaches LGA is listed in Schedule 1 of the SEPP.
- The land is not:
  - land dedicated or reserved under the National Parks and Wildlife Act 1974, or acquired under Part 11 of that Act;
  - o land dedicated under the Forestry Act 2012 as a State forest or a flora reserve;
  - o land on which biodiversity certification has been conferred, and is in force, under Part 8 of the Biodiversity Conservation Act 2016; or
  - o land in the following land use zones, or an equivalent land use zone, unless the zone is in a local government area marked with '\*' Schedule 1 of the SEPP:
    - Zone RU1;
    - Zone RU2; or
    - Zone RU3.



Part 2 clause 11 (Development assessment process—no approved koala plan of management for land) of the SEPP applies to land that:

- has an area of at least 1 hectare (including adjoining land within the same ownership), and
   the Subject Property has an area greater than 1ha.
  - does not have an approved koala plan of management applying to the land.
    - o There is no approved koala plan of management for the Subject Property.

#### 1.7.1 Koala Habitat Assessment

Before a council may grant consent to a development application for consent to carry out development on the land, the council must assess whether the development is likely to have any impact on koalas or koala habitat.

# 1.7.1.1 Does the Subject Site Include any trees belonging to the koala use tree species listed in Schedule 2 for the relevant koala management area?

Yes, Schedule 2- Central Coast Koala Management Area includes five (5) koala use tree species which were identified within the Subject Site:

Eucalyptus haemastoma;

Eucalyptus scias; and

Eucalyptus resinifera;

Eucalyptus tereticornis.

Eucalyptus robusta;

#### 1.7.1.2 Does the Subject Site Contain Core Koala Habitat?

Core Koala Habitat is defined as:

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

The Subject Site is not core Koala habitat. During the site assessment no koalas or signs of koala occupancy (scats, scratch marks) were observed within the Subject Site and no recent records (Last 18 years) are present within 2.5km of the Subject Site (DPIE 2021b). Therefore, no further assessment is required under this SEPP.

#### 1.8 Pittwater Local Environmental Plan 2014 (PLEP)

#### 1.8.1 Zoning

The Subject Property is zoned under two (2) land use zones, 'SP2- Infrastructure' and 'R2- Low Density Residential'.

The SP2 zone objectives are:

- To provide for infrastructure and related uses; and
- To prevent development that is not compatible with or that may detract from the provision of infrastructure.

The objectives of the R2 zone are:

- To provide for the housing needs of the community within a low-density residential environment;
- To enable other land uses that provide facilities or services to meet the day to day needs of residents; and



• To provide for a limited range of other land uses of a low intensity and scale, compatible with surrounding land uses.

The proposed development aligns with the objectives of both SP2 and R2 as:

- The proposal involves the construction of buildings for the use of public residents; and
- The proposed will provide facilities for day to day use by the community.

#### 1.8.2 Clause 7.6- Biodiversity

The objective of this clause is to maintain terrestrial, riparian and aquatic biodiversity by:

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

This clause applied to land mapped on the 'Biodiversity Map'. No lands within the Subject Site are mapped on the 'Biodiversity Map', therefore this clause does not apply to the Subject Site.

#### 1.9 Pittwater 21 Development Control Plan (PDCP)

#### 1.9.1 B4.5 Landscape and Flora and Fauna Enhancement Category 3 Land

The Northern Beaches Property Search identified the 'Land within Area 3 of the Landscaped Area Map' overlaying the Subject Site. The controls are:

- Development shall retain and enhance habitat for threatened species, endangered populations, endangered ecological communities and locally native species;
- Development shall provide flora and fauna habitat by active restoration, regeneration, and / or creation;
- Development shall result in no significant onsite loss of canopy cover or a net loss in native canopy trees; and
- Landscaping is not to include environmental weeds.

The development is sited and designed to retain habitat for threatened species where possible. The proposed development proposes the planting of forty-two (42) native trees (Arcadia 2021b), resulting in a net gain of native tree species. Proposed planting will see numerous shrubs and groundcover species planted with all planting/ landscaping works to be of locally indigenous species (**Figure 4**, **Appendix C**). As the proposal will disturb more than 500m<sup>2</sup> of vegetation this report includes the finding of the ecological site assessment and biodiversity impact assessment.

#### 1.9.2 B4.6 Wildlife Corridors

This control applies to land mapped as 'Wildlife Corridor'; the Northern Beaches Council Property Search did not identify 'Wildlife Corridor' as overlaying the Subject Site. As such, the controls of this clause do not apply.

#### 1.9.3 B4.22 Preservation of Trees and Bushland Vegetation

This control applies to all land covered within the Pittwater Local Environmental Plan 2014, as the Subject Site is covered by the PLEP the controls apply. However, the proposed development seeks development consent under Part 4 of the EP&A Act, as such a vegetation clearing permit is not required.





#### Figure 4 Proposed Tree Canopies (Arcadia 2021a).

#### 1.10 Scope of Assessment

The objectives of this FFA were to:

- Establish the likelihood of occurrence of migratory species, threatened species, endangered populations, and threatened ecological communities as listed under the BC Act and/or the EPBC Act;
- Assess any potential impacts to species and/or communities listed under the BC Act and EPBC Act;
- Identify and map the distribution of vegetation communities within the Subject Site;
- Record presence and the extent of any known or potential fauna habitat features such as nests, dreys, caves, crevices, culverts, pools, soaks, flowering trees, fruiting trees, or hollow-bearing trees and provide recommendations for on-going management of these habitat features and any fauna present;
- Record presence and the extent of any priority weeds or weed infestations and provide recommendations for on-going management; and
- Recommend any controls or additional actions to be taken to protect or improve environmental outcomes of the proposed development.

#### 1.11 Study Limitations

This study was not intended to provide a complete inventory of all flora and fauna species with potential to occur on the Subject Site. The species list provided for the Subject Site in this report was restricted to what was observed during the site assessment by the Narla Ecologist. The timing of the survey may not have coincided with emergence times of some species of flora and fauna, such as seasonally flowering herbs, seasonal migratory fauna, or nocturnal fauna. To account for those species that could not be identified during the field survey, detailed habitat assessments were combined with desktop research and local ecological knowledge to establish an accurate prediction of the potential for such species to occur on or adjacent the Subject Site.



# 2. Methodology

#### 2.1 Desktop Assessment and Literature Review

A thorough literature review of local information relevant to the Northern Beaches Council area was undertaken. Searches using NSW Wildlife Atlas (BioNet; DPIE 2021b) and the Commonwealth Protected Matters Search Tool (DAWE 2021) were conducted to identify all current threatened flora and fauna, as well as migratory fauna records within a 10km x 10km cell search area centred on the Subject Site. These data were used to assist in establishing the presence or likelihood of any ecological values as occurring on or adjacent the Subject Site, and helped inform our Ecologist on what to look for during the site assessment.

Soil landscape and geological mapping was examined to gain an understanding of the environment on the Subject Site and assist in determining whether any threatened flora or ecological communities may occur there (Chapman et al. 2009).

#### 2.2 Ecological Site Assessment

#### 2.2.1 General Survey

A site assessment was undertaken by experienced Narla Ecologist, Angus McClelland, on Tuesday the 1<sup>st</sup> of March 2021. During the site assessment, the following activities were undertaken:

- Identifying and recording the vegetation communities present within the Subject Site, with focus on identifying any threatened ecological communities (TEC);
- Recording a detailed list of flora species encountered within the Subject Site, with a focus on threatened species, species diagnostic of threatened ecological communities, and priority weeds;
- Recording opportunistic sightings of any fauna species seen or heard on or within the immediate surrounds of the Subject Site;
- Targeted surveys for threatened flora;
- Identifying and recording the locations of notable fauna habitat such as important nesting, roosting, or foraging microhabitats;
- Assessing the connectivity and quality of the vegetation within the Subject Site and surrounding area; and
- Targeting the habitat of any threatened and regionally significant fauna including:
  - Tree hollows (habitat for threatened large forest owls, parrots, and arboreal mammals);
  - 。 Caves and crevices (habitat for threatened reptiles, small mammals, and microbats);
  - Termite mounds (habitat for threatened reptiles);
  - Soaks (habitat for threatened frogs);
  - Wetlands (habitat for threatened fish, frogs, and water birds);
  - Drainage lines (habitat for threatened fish and frogs);
  - Fruiting trees (food for threatened frugivorous birds and mammals);
  - Flowering trees (food for threatened nectarivorous birds and mammals);
  - Trees and shrubs supporting nest structures (habitat for threatened birds and arboreal mammals); and
  - Any other habitat features that may support fauna (particularly threatened) species.



#### 2.2.2 Weather Conditions

Weather conditions recorded at the nearest weather station (Terrey Hills AWS 066059) prior to and during the site assessment are provided in **Table 3** (BOM 2021a, BOM 2021b). The data revealed normal climatic conditions for this time of year with medium temperatures and rainfall. These conditions may have been conducive to the emergence and flowering of threatened species.

Survey date	Minimum Temp. (°C)	Maximum Temp. (°C)	Rainfall (mm)
23/02/2021	17.7	19.6	2.2
24/02/2021	15.1	21.1	3.2
25/02/2021	16.4	24	0.4
26/02/2021	16.7	26.4	1
27/02/2021	18.5	21.6	0.2
28/02/2021	17.9	26.1	0.4
1/03/2021	18.4	30.2	0

Table 3. Weather conditions recorded at Terrey Hills AWS (station 066059) preceding and during the site assessment (site assessment date in bold)

#### 2.2.3 Mapping and Analysis of Vegetation Communities

Narla examined local satellite imagery, geological mapping, soil landscape mapping, and topographic mapping, in addition to existing vegetation mapping (OEH 2016b) in order to stratify the Subject Site and guide the site assessment survey efforts. The following documents were also consulted during the site assessment to assist with the identification of vegetation communities present within the Subject Site:

- Chapman G.A., Murphy C.L., Tille P.J., Atkinson G. and Morse R.J (2009) Soil Landscapes of the Sydney 1:100,000 Sheet map, Ed. 4, Department of Environment, Climate Change and Water, Sydney.;
- Department of Planning, Industry and Environment (DPIE) (2021d) eSPADE v2.1 https://www.environment.nsw.gov.au/eSpade2Webapp#
- Office of Environment and Heritage (OEH) (2016a) The Native Vegetation of the Sydney Metropolitan Area. Version 3.1
- Office of Environment and Heritage (OEH) (2016b) The Native Vegetation of the Sydney Metropolitan Area. Volume 2: Vegetation Community Profiles. Version 3.0

#### 2.2.4 Impact Assessment

An assessment of likely occurrence was carried out for locally occurring threatened species (**Table 5** and **Table 7**) and threatened migratory species (**Table 8**). It was then determined whether a further impact assessment (5-part Test) was required for any locally occurring threatened species or communities.



### 3. Native Vegetation

#### 3.1 Vegetation Community

#### 3.1.1 Historically Mapped Vegetation Communities

Historic vegetation mapping (OEH 2016b) identified the vegetation within the broader Subject Property and surrounds as containing two (2) vegetation communities (**Figure 5**):

- S\_WSF34: Central Coast Escarpment Dry Forest; and
- Urban exotic/native vegetation

#### 3.1.2 Field-validated Vegetation Communities

The field survey conducted by Narla Ecologists identified the vegetation within the Subject Site as one (1) vegetation community, Planted Natives and Exotics. The vegetation within this community is detailed within **Table 4**. Vegetation mapping of the Subject Site is presented in **Figure 6**.



Table 4. Description of Planted Natives and Exotics identified within the Subject Site.





Figure 5. Historically mapped vegetation communities within and surrounding the Subject Property (OEH 2016b).



Figure 6. Narla field-validated vegetation communities within the Subject Site.

## 4. Threatened Species

#### 4.1 Threatened Flora

Desktop analysis revealed a range of threatened flora as occurring or having the potential to occur on or within a 10km x 10km cell centred on the Subject Site. Targeted surveys were undertaken throughout the Subject Site for potentially occurring threatened flora.

One (1) BC Act listed threatened flora species was identified (*Eucalyptus scoparia*), however, due this species being significantly out of its natural range and it common use in cultivation and landscaping it was excluded from this assessment. This tree is also listed as a 'Exempt Tree Species' within the Northern Beaches LGA (Northern Beaches Council 2015), as such can be removed without consent.

A list of flora species identified during the site assessment is presented in Appendix A.

The following locally occurring species were assessed for their potential to occur within the Subject Site (**Table 5**). It was deemed that the proposed development will have no significant impact on these species. Therefore, no further assessment of impacts pursuant the BC Act (e.g., Biodiversity Development Assessment Report [BDAR]) and/or EPBC Act Referral to Commonwealth will be required.

Species	BC Act	EPBC Act	Likelihood of occurrence within the Subject Site	Further Impact Assessment Required?
<i>Callistemon linearifolius</i> (Netted Bottle Brush)	Vulnerable	-	Low. Grows in dry sclerophyll forest on the coast and adjacent ranges. Although correct landscape positioning is present within the Subject Site, a targeted survey was undertaken and no individuals were identified.	No
Chamaesyce psammogeton (Sand Spurge)	Endangered	-	Very low. Grows on fore-dunes, pebbly strandlines and exposed headlands. Such habitat is not present within the Subject Site, a targeted survey was undertaken and no individuals were identified.	No
Epacris purpurascens var. purpurascens	Vulnerable	-	Low. This species is found in a range of habitat types, most of which have a strong shale soil influence. Such soil was not identified within the Subject Site, a targeted survey was undertaken and no individuals were identified.	No

Table 5. Assessment of likely occurrence of threatened flora species within the Subject Site



Species	BC Act	EPBC Act	Likelihood of occurrence within the Subject Site	Further Impact Assessment Required?
Eucalyptus camfieldii (Camfield's Stringybark)	Vulnerable	Vulnerable	Low. This species is found in poor coastal country in shallow sandy soils overlying Hawkesbury sandstone, in coastal heath mostly on exposed sandy ridges. Occurs mostly in small scattered stands near the boundary of tall coastal heaths and low open woodland of the slightly more fertile inland areas. No such soil exists within the Subject Site. A targeted survey was undertaken and no individuals were identified.	No
<i>Genoplesium baueri</i> (Bauer's Midge Orchid)	Endangered	Endangered	Low. Site assessment was carried out during the optimal survey period for this species. A targeted survey was undertaken and no individuals were identified.	No.
<i>Grammitis stenophylla</i> (Narrow-leaf Finger Fern)	Endangered	-	Low. Occurs in moist places, usually near streams, on rocks or in trees, in rainforest and moist eucalypt forest. Such habitat does occur within the Subject Site. A targeted survey was undertaken and no individuals were identified.	No
<i>Grevillea caleyi</i> (Caley's Grevillea)	Critically Endangered	Critically Endangered	Low. This species is restricted to an 8km square area around Terrey Hills. All sites occur on the ridgetop between elevations of 170 to 240m above sea level, in association with laterite soils and a vegetation community of open forest, generally dominated by <i>Eucalyptus sieberi</i> and <i>E. gummifera</i> . No such habitat occurs within the Subject Site. A targeted survey was undertaken and no individuals were identified.	No
Kunzea rupestris	Vulnerable	Vulnerable	Low. The species is associated with shallow depressions on large sandstone rock outcrops. No such habitat exists within the Subject Site. A targeted survey was undertaken and no individuals were identified.	No
Lasiopetalum joyceae	Vulnerable	Vulnerable	Low. The species is associated with heath on sandstone. No such habitat exists within the Subject Site. A targeted survey was undertaken and no individuals were identified.	No.



Species	BC Act	EPBC Act	Likelihood of occurrence within the Subject Site	Further Impact Assessment Required?
<i>Microtis angusii</i> (Angus's Onion Orchid)	Endangered	Endangered	Low. No proximal records exist from within the Subject Site, or immediately adjacent areas. The optimal survey period for this orchid is October. Although the site assessment was conducted outside of the optimal survey period, the Subject Site does not occur on the restricted ridgetop lateritic soils required by this species. It is considered unlikely that this threatened orchid would occur within the Subject Site.	No
<i>Persoonia hirsuta</i> (Hairy Geebung)	Endangered	Endangered	Endangered Low. The Hairy Geebung is found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone. It is usually present as isolated individuals or very small populations. Although potential habitat may exist within the Subject Site, a targeted survey was undertaken and no individuals were identified.	
Pimelea curviflora var. curviflora	Vulnerable	Vulnerable	Low. Occurs on shale/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes amongst woodlands. A targeted survey was undertaken and no individuals were identified.	No
<i>Prostanthera densa</i> (Villous Mint-bush))	Vulnerable	Vulnerable	Low. Occurs in sclerophyll forests and shrublands on coastal headlands and near coastal ranges, chiefly on sandstone, and rocky slopes near the sea. Although appropriate habitat may exist within the Subject Site, a targeted survey was undertaken and no individuals were identified.	No
<i>Rhodamnia rubescens</i> (Scrub Turpentine)	Critically Endangered	-	Low. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils. No such habitat was identified within the Subject Site. A targeted survey was undertaken and no individuals were identified.	No
Syzygium paniculatum (Magenta Lilly Pilly)	Endangered	Vulnerable	Low. This species is restricted mainly to remnant stands of Littoral Rainforest. No such habitat occurs within the Subject Site.	No
Tetratheca glandulosa	Vulnerable	-	Low. This species is associated with shale- sandstone transition habitat. No such soil is present within the Subject Site, a targeted survey was undertaken and no individuals were identified.	No



#### 4.2 Threatened Fauna

Details of the fauna habitat recorded within the Subject Site are included in **Table 6**. The likelihood of occurrence of threatened fauna species within the Subject Site is presented in **Table 7**.

It was deemed that the proposed works has potentially to impact upon the foraging habitat of the Grey-headed Flying-fox (*Pteropus poliocephalus*). Therefore, pursuant to the BC Act and EPBC Act a '5-Part Test Assessment of Significance' (**Appendix D**) and a 'Assessment of Significant Impact Criteria' was conducted (**Appendix E**)

It was deemed that the proposed works will have no potential for significant impact upon any other potentially occurring BC Act or EPBC Act listed threatened species. Therefore, no further assessments under the '5-Part Test Assessment of Significance' or 'Assessment of Significant Impact Criteria' was required.

It was also deemed that the proposed works will not have a significant impact such that a local viable population or occurrence of any of the threatened species will be placed at risk of extinction. Therefore, no BDAR or EPBC Act Referral to the Commonwealth is required for the proposed development.

A small suite of native, common avian fauna species were identified within and surrounding the Subject Site during the site assessment. All native fauna species encountered were listed as 'protected' under the BC Act. The list of fauna recorded during the site visit was produced opportunistically (**Appendix B**).

Habitat component	Site values
Coarse woody debris	Absent.
Rock outcrops and bush rock	Absent.
Caves, crevices and overhangs	Absent.
Culverts, bridges, mine shafts, or abandoned structures	Absent.
Nectar/lerp-bearing Trees	Nectar/ lerp bearing trees were recorded within the Subject Site, including Eucalyptus tereticornis, Lophostemon confertus, Eucalyptus scoparia, Eucalyptus robusta, Eucalyptus resinifera, Eucalyptus haemastoma, Angophora costata, Eucalyptus scias and Corymbia gummifera. These trees may provide intermittent nectar sources for nomadic nectivores such as the Grey-headed Flying-fox.
Nectar-bearing shrubs	Absent.
Large stick nests	Absent.
Sap and gum sources	A host of sap/ gum sources were available within the Subject Site with various <i>Eucalyptus, Angophora</i> and <i>Corymbia</i> species present.
She-oak fruit (Glossy Black Cockatoo feed)	Absent.
Seed-bearing trees and shrubs	A host of seed-bearing trees were available within the Subject Site with various <i>Eucalyptus, Angophora</i> and <i>Corymbia</i> species present.
Soft-fruit-bearing trees	A <i>Syzygium species</i> was identified within the Subject Site and may provide foraging habitat for fructivores such as the Grey-headed Flying-fox.

#### Table 6. Fauna habitat values



Habitat component	Site values
Dense shrubbery and leaf litter	Absent.
Tree hollows	Absent.
Decorticating bark	Absent.
Wetlands, soaks, and streams	Absent.
Open water bodies	Absent.
Estuarine, beach, mudflats, and rocky foreshores	Absent.
Nests and Possums Dreys	Absent.



#### Table 7. Assessment of likely occurrence of threatened fauna species within the Subject Site

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Anthochaera phrygia</i> (Regent Honeyeater)	Critically Endangered	Critically Endangered	Low	This species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River She-oak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. No such habitat was identified within the Subject Site.	There are only two (2) known key breeding regions remaining in NSW: Capertee Valley and the Bundarra- Barraba region.	Negligible, no anticipated net loss of foraging or breeding habitat.	No
Artamus cyanopterus (Dusky Wood swallow)	Vulnerable	-	Potential	Present. The species feeds on invertebrates and flowering plants. Nectar bearing trees and shrubs were present within the Subject Site.	Present. This species nests in shrubs and low trees, creating an open cup shaped nest. Most breeding occurs on the western slopes of the Great Dividing Range. No nests were identified within the Subject Site.	Negligible impacts to foraging habitat due to the mobility of the species. Negligible impacts to breeding habitat. Most breeding for this species occurs on the western slopes of the Great Dividing Range, the Subject Site does not occur within this area.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Botaurus poiciloptilus</i> (Australasian Bittern)	Endangered	Endangered	Low	Not present. This species favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes and spikerushes. Hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails. No such habitat was identified within the Subject Site.	Not present. This species nests in densely vegetated wetlands. No such habitat was identified within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat.	No
<i>Burhinus grallarius</i> (Bush Stone- curlew)	Endangered	-	Potential	Present. This species inhabits open forests and woodlands with a sparse grassy ground layer and fallen timber. Sub optimal- habitat was identified within the Subject Site.	Not present. This species nests on the ground in a scrape or small bare patch. No nests were identified within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat.	No
Callocephalon fimbriatum (Gang-gang Cockatoo)	Vulnerable	-	Low	Present. The species feeds on the seeds of native flora including eucalyptus and acacia seed. The species favours box-gum and box- ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. Potential feed trees present within the Subject Site.	Not present. Dependent on large hollow-bearing eucalypts for nest sites. No hollows were identified within the Subject Site.	Negligible, impacts to foraging habitat due to the mobility of the species and vast suite of feed trees existing elsewhere in the Subject Property and greater area. No anticipated impacts to breeding habitat.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Calyptorhynchus lathami</i> (Glossy Black- Cockatoo)	Vulnerable	_	Low	Not present. This species feeds almost exclusively on the seeds of several species of she-oak ( <i>Casuarina</i> and <i>Allocasuarina</i> species). Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of she-oak occur. No she-oaks species were identified within the Subject Site.	Not present. Dependent on large hollow-bearing eucalypts for nest sites. No hollows were identified within the Subject Site.	Negligible, no anticipated loss of foraging or breeding habitat.	No
<i>Cercartetus nanus</i> (Eastern Pygmy- possum)	Vulnerable	-	Low	Present. This species is found in a broad range of habitats from rainforest through sclerophyll (including Box- Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes, as well as insects. Eucalyptus species present within the Subject Site.	Not present. Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum dreys or thickets of vegetation, although hollows are preferred. No such habitat was present within the Subject Site	Negligible impact to foraging habitat given the mobility of the species and vast suite of feed trees existing elsewhere in the Subject Property and greater area. No anticipated impact to breeding habitat.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Chalinolobus dwyeri</i> (Large-eared Pied Bat)	Vulnerable	Vulnerable	Low	Present. This species forages for small, flying insects in well- timbered areas. Potential foraging habitat is present within the Subject Site.	Not present. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle- shaped mud nests of the Fairy Martin ( <i>Petrochelidon ariel</i> ). No such habitat was identified within the Subject Site.	Negligible impact to foraging habitat given the mobility of the species and vast area of similar habitat existing elsewhere in the Subject Property and surrounds. No anticipated loss of breeding habitat.	No
<i>Daphoenositta chrysoptera</i> (Varied Sittella)	Vulnerable	-	Low	Present. Species feeds on arthropods from crevices in rough or decorticating bark. Such habitat was present within the Subject Site.	Not present. This species nests in shrubs and low trees, creating an open cup shaped nest. No proximal records exist within the Subject Site and no nests were identified within the Subject Site.	Negligible impact to foraging habitat given the mobility of the species and vast area of similar habitat existing elsewhere in the Subject Property and surrounds. No anticipated loss of breeding habitat.	No
<i>Dasyurus maculatus</i> (Spotted-tailed Quoll)	Vulnerable	Endangered	Low	Present. Consumes a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits, reptiles and insects. Also eats carrion and takes domestic fowl. Potential prey items may exist within the Subject Site.	Not present. This species uses hollow- bearing trees, fallen logs, small caves, rock outcrops and rocky- cliff faces as den sites. No such habitat exists within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Falsistrellus tasmaniensis</i> (Eastern False Pipistrelle)	Vulnerable	_	Low	Present. This species forages for small, flying insects just below the tree canopy. Such foraging habitat exists within the Subject Site.	Not present. The species roosts in eucalypt hollows. No such habitat was detected within the Subject Site.	Negligible impact to foraging habitat given the mobility of the species and vast area of similar habitat existing elsewhere in the Subject Property and surrounds. No anticipated loss of breeding habitat.	No
<i>Glossopsitta pusilla</i> (Little Lorikeet)	Vulnerable	_	Low	Present. This species forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in <i>Angophora</i> , <i>Melaleuca</i> , and other tree species. Mostly feeds on nectar and pollen of flowers in the open canopy of woodland trees. Both <i>Eucalyptus</i> and <i>Angophora</i> species are present within the Subject Site.	Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth- barked Eucalypts. Entrance is small (3cm) and usually high above the ground (2–15m). No hollows were identified within the Subject Site.	Negligible, no anticipated loss of foraging habitat considering the mobility of the species and vast area of potential foraging habitat elsewhere in the Subject Property and surrounds. No anticipated loss of breeding habitat.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)	Vulnerable	_	Potential	Present. Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Occurs at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries, and mangroves. Feed mainly on fish and freshwater turtles, but also waterbirds, reptiles, mammals and carrion. Potential prey items may occur within the Subject Site.	Not present. Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nests are large structures built from sticks and lined with leaves or grass. No nests were identified during the site assessment.	Negligible, no anticipated loss of foraging or breeding habitat.	No
Heleioporus australiacus (Giant Burrowing Frog)	Vulnerable	Vulnerable	Low	Present. Species occurs in heath, woodland and dry sclerophyll forest. It forages on invertebrates. Although invertebrates occur within the Subject Site the form of vegetation is suboptimal for this species.	Not present, the species breeds in soaks and second order streams. No such habitat was present within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat.	No
Hieraaetus morphnoides (Little Eagle)	Vulnerable	-	Low	Present. This species occupies open eucalypt forest, woodland or open woodland. Preys on birds, reptiles and mammals, occasionally adding large insects and carrion. Potential prey items may occur within the Subject Site.	Not present. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter. No nests were identified during the site assessment.	Negligible, no anticipated net loss of foraging or breeding habitat as no trees are proposed for removal.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Isoodon obesulus obesulus</i> (Southern Brown Bandicoot [eastern])	Endangered	Endangered	Potential	Present. Typically found in heath or open forest with a heathy understorey on sandy or friable soils. They feed on a variety of ground-dwelling invertebrates and the fruit- bodies of hypogeous (underground-fruiting) fungi. Their searches for food often create distinctive conical holes in the soil. The Subject Site may provide suboptimal foraging habitat for this species, no distinctive scratching's were observed within the Subject Site.	Not present. Nest during the day in a shallow depression in the ground covered by leaf litter, grass or other plant material. Nests may be located under Grass trees <i>Xanthorrhoea</i> spp., blackberry bushes, and other shrubs, or in rabbit burrows. No such habitat is present within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat.	No
<i>lxobrychus flavicollis</i> (Black Bittern)	Vulnerable	_	Low	Not present. Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves. Feeds on frogs, reptiles, fish and invertebrates, including snails, dragonflies, shrimps. and crayfish, with most feeding done at dusk and at night. No such habitat was identified within the Subject Site.	Not present. Nests, built in spring, are located on a branch overhanging water and consist of a bed of sticks and reeds on a base of larger sticks. No such habitat is present within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Lathamus discolor</i> (Swift Parrot)	Endangered	Critically Endangered	Low	Present. On the mainland, this species occurs in areas where eucalypts are flowering profusely or where there are abundant lerp infestations (from sap-sucking bugs). Favoured feed trees include winter flowering species such as Eucalyptus robusta, Corymbia maculata, C. gummifera, E. tereticornis, E. sideroxylon, E. pilularis, and E. albens. Known feed trees for this species were present within the Subject Site	This species breeds in Tasmania.	Negligible, no anticipated loss of foraging habitat given the mobility of the species and suite of feed trees that occur elsewhere in the Subject Property and surrounds. No loss of breeding habitat.	No
<i>Litoria aurea</i> (Green and Golden Bell Frog)	Endangered	Vulnerable	Low	Not present. Species forages on insects and inhabits marshes, dams and stream sides, particularly those containing bullrushes ( <i>Typha</i> spp.) or spikerushes ( <i>Eleocharis</i> spp.) No such habitat was identified within the Subject Site.	The species breeds within aquatic habitats. No such habitat was identified within the Subject Site.	Negligible, no anticipated loss of foraging or breeding habitat.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Lophoictinia isura</i> (Square-tailed Kite)	Vulnerable	_	Potential	Present. Found in a variety of timbered habitats including dry woodlands and open forests. The species is a Is a specialist hunter of passerines, especially honeyeaters, and most particularly nestlings, and insects in the tree canopy. Prey species may occur within the Subject Site.	Not present. Species nests along or near watercourses, in a fork or a larger horizontal limb. No such habitat was identified within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat.	No
<i>Melithreptus gularis gularis</i> (Black-chinned Honeyeater (eastern subspecies)	Vulnerable	_	Low	Present. Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts. Sub-optimal habitat within the Subject Site.	Not present. Nest is placed high in the crown of a tree, in the uppermost lateral branches, hidden by foliage. It is a compact, suspended, cup-shaped nest.	Negligible impact to foraging habitat given the mobility of the species and vast area of similar habitat existing elsewhere in the Subject Property and surrounds.	No
<i>Micronomus norfolkensis</i> (Eastern Coastal Free-tailed Bat)	Vulnerable	_	Potential	Present. Species insectivorous and occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Potential prey items may exist within the Subject Site.	Not present. Roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges, and sometimes buildings during the day. No such habitat was identified within the Subject Site.	Negligible impact to foraging habitat given the mobility of the species and the suite of similar habitat that exists elsewhere within the Subject Property and Surrounds. Negligible, no anticipated net loss of breeding habitat.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Miniopterus australis</i> (Little Bent- winged Bat)	Vulnerable	_	Potential	Present. Found in moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. At night, this species forages for small insects beneath the canopy of densely vegetated habitats. Potential foraging habitat within the Subject Site.	Not present. Only five (5) nursery sites/maternity colonies are known in Australia. They require large colonies roosting together to provide the high temperatures needed to rear their young. No suitable breeding habitat was identified within the Subject Site.	Negligible impact to foraging habitat given the mobility of the species and the suite of similar habitat that exists elsewhere within the Subject Property and Surrounds. No loss of breeding habitat.	No
Miniopterus orianae oceanensis (Large Bent- winged Bat)	Vulnerable	-	Potential	Present. Hunt in forested areas, catching moths and other flying insects above the tree tops. Potential foraging habitat may present within the Subject Site.	Not present. This species only breeds in caves. No suitable breeding habitat was identified within the Subject Site.	Negligible impact to foraging habitat given the mobility of the species and the suite of similar habitat that exists elsewhere within the Subject Property and Surrounds. No loss of breeding habitat.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Myotis macropus</i> (Southern Myotis)	Vulnerable	_	Low	Not present. This species forages over streams and pools catching insects and small fish by raking their feet across the water surface. No such habitat is present within the Subject Site.	Not present. Generally, roosts in groups of 10-15 close to water in caves, mine shafts, hollow- bearing trees, storm water channels, buildings, under bridges, and in dense foliage. No such habitat was identified within the Subject Site.	Negligible, no anticipated impact to foraging or breeding habitat as no trees are proposed for removal.	No
Neophema pulchella (Turquoise Parrot)	Vulnerable	_	Potential	Present. Species lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. It forges on seeds or grasses and herbaceous plants. Potential foraging habitat present on the Subject Site.	Not present. Species nests in tree hollows, logs or posts. No such habitat was identified within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Ninox connivens</i> (Barking Owl)	Vulnerable	-	Potential	Present. Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Preferentially hunts small arboreal mammals such as Squirrel Gliders and Common Ringtail Possums, but when loss of tree hollows decreases these prey populations the owl becomes more reliant on birds, invertebrates, and terrestrial mammals such as rodents and rabbits. Can catch bats and moths on the wing, but typically hunts by sallying from a tall perch. Potential prey items may occur within the Subject Site.	This species nests in large hollows. No hollows were identified within the Subject Site.	Negligible, no anticipated impact to foraging or breeding habitat as no trees are proposed for removal.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Ninox strenua</i> (Powerful Owl)	Vulnerable	_	Potential	Present. The species breeds and hunts in open or closed sclerophyll forest or woodlands and hunts small mammals. It roosts by day in dense vegetation comprising species such as Syncarpia glomulifera, Allocasuarina littoralis, Acacia melanoxylon, Angophora floribunda, Exocarpus cupressiformis and a number of eucalypt species. Potential foraging habitat is present on the Subject Site.	This species favours hollows >20cm in diameter. No hollows were identified within the Subject Site.	Negligible, no anticipated impact to foraging or breeding habitat as no trees are proposed for removal.	No
<i>Pandion cristatus</i> (Eastern Osprey)	Vulnerable	-	Potential	Not present. Favour coastal areas, especially the mouths of large rivers, lagoons, and lakes. Feed on fish over clear, open water. No such habitat is present with the Subject Site.	Not present. Nests are made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea. No nests were identified within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Petaurus norfolcensis</i> (Squirrel Glider)	Vulnerable	_	Low	Present. The species Inhabits Blackbutt-Bloodwood Forest with heath understorey in coastal areas. The species diet consists of Acacia gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein. Potential feed trees are present within the Subject Site.	Not present. The species requires abundant tree hollows for refuge and nest sites. No such habitat was present within the Subject Site.	Negligible, no anticipated net loss of foraging habitat given the mobility of the species and vast suite of feed trees existing in the Subject Property and greater locality or breeding habitat.	No
<i>Petroica boodang</i> (Scarlet Robin)	Vulnerable	_	Low	Present. The species live in dry eucalypt forests and woodlands, habitat usually contains abundant logs and fallen timber. Birds forage from low perches, fence-posts or on the ground, from where they pounce on small insects and other invertebrates which are taken from the ground. Sub-optimal foraging habitat exists within the Subject Site.	Not present. This species' nest is an open cup made of plant fibres and cobwebs and is built in the fork of tree usually more than 2 metres above the ground. No nests were identified within the Subject Site.	Negligible impact to foraging habitat given the mobility of the species and vast area of similar habitat existing elsewhere in the Subject Property and surrounds.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
Phascolarctos cinereus (Koala)	Vulnerable	_	Low	Present. Potential feed trees were identified within the Subject Site however, no recent proximal records (DPIE 2021b) have been recorded near the Subject Site. The highly urbanised and fragmented nature of the Subject Site suggests the potential for Koala presence is extremely low.	No potential breeding habitat exists within the Subject Site. The urbanised and fragmented nature of the Subject Site makes the potential for Koala presence extremely low.	Negligible, no anticipated net loss of foraging or breeding habitat.	No
Pseudomys novaehollandiae (New Holland Mouse)	-	Vulnerable	Low	Not present. Species is known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes. The Subject Site lacks the mid- storey necessary for this species to be present.	Not present. This species breeds in burrows. No such habitat was identified within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat.	No
<i>Pseudophryne australis</i> (Red-crowned Toadlet)	Vulnerable	-	Low	Not present. Occurs in open forests, mostly on Hawkesbury and Narrabeen Sandstones. Inhabits periodically wet drainage lines below sandstone ridges that often have shale lenses or cappings. No such habitat was identified within the Subject Site.	Not present. Breeding congregations occur in dense vegetation and debris beside ephemeral creeks and gutters. No such habitat was identified within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Pteropus poliocephalus</i> (Grey-headed Flying-fox)	Vulnerable	Vulnerable	Potential	Present. Feed on the nectar and pollen of native trees, in particular <i>Eucalyptus</i> , <i>Melaleuca</i> , and <i>Banksia</i> , and fruits of rainforest trees and vines. Numerous feed trees present within the Subject Site.	No breeding camps were identified within the Subject Site; however, a breeding camp is located approximately 1km from the Subject Site	Some anticipated loss of foraging habitat with the removal of numerous potential feed trees. The proximal location of a breeding camp may make the importance of these feed trees within the Subject Site greater. No loss of breeding habitat.	Yes Appendix D Appendix E
<i>Ptilinopus magnificus</i> (Wompoo Fruit- dove)	Vulnerable	_	Low	Not present. Occurs in, or near rainforest, low elevation moist eucalypt forest and brush box forests. Feeds on a diverse range of tree and vine fruits and is locally nomadic - following ripening fruit. Thought to be an effective medium to long- distance vector for seed dispersal. Although potential food items are present the vegetation formation is not conducive to use by this species.	Not present. The nest is a typical pigeon nest a flimsy platform of sticks on a thin branch or a palm frond, often over water. No nests were identified within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Ptilinopus regina</i> (Rose-crowned Fruit-Dove)	Vulnerable	_	Low.	Not present. Rose-crowned Fruit-doves occur mainly in sub-tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful. No such habitat exists within the Subject Site.	Not present. The species nest in rainforests with dense growth vines. The nest is a frail loosely woven cup of twigs and tendrils. No nests were detected within the Subject Site.	Negligible, no net loss of suboptimal foraging habitat. No anticipated net loss of breeding habitat.	No
<i>Ptilinopus superbus</i> (Superb Fruit- dove)	Vulnerable	_	Low	Not present. Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees. No such habitat was identified within the Subject Site.	Not present. The nest is a structure of fine interlocked forked twigs and is usually 5- 30m up in rainforest and rainforest edge tree and shrub species. No nests were identified in the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat.	No
<i>Saccolaimus flaviventris</i> (Yellow-bellied Sheathtail-bat)	Vulnerable	-	Low	Present. This species forages for small, flying insects. The species flies high and fast over the forest canopy, but lower in more open country. Foraging habitat may be present within the Subject Site	Not present. Species roosts in trees hollows and dilapidated buildings. No such habitat exists within the Subject Site	Negligible impact to foraging habitat. No anticipated net loss of breeding habitat.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Scoteanax rueppellii</i> (Greater Broad- nose bat)	Vulnerable	-	Low	Not present. Species Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m. No such habitat exists within the Subject Site.	Not present. Species roosts in trees hollows and dilapidated buildings. No such habitat exists within the Subject Site	Negligible, no anticipated net loss of foraging or breeding habitat.	No
Tyto novaehollandiae Masked Owl)	Vulnerable	-	Low	Present. Lives in dry eucalypt forests and woodlands from sea level to 1100m. The species often hunts along the edges of forests, including roadsides. Its diet consists of tree-dwelling and ground mammals, especially rats. Sub optimal foraging habitat present within the Subject Site.	Not present. This species nests in large hollows. No hollows were identified within the Subject Site.	Negligible impact to foraging habitat. No anticipated net loss of breeding habitat.	No
<i>Varanus rosenbergi</i> (Rosenburg's Goanna)	Vulnerable	_	Low	Present. Species is found in heath, open forest and woodland and associated with termites. The species feeds on carrion, birds, eggs, reptiles and small mammals. Potential prey items may occur within the Subject Site. However, the Subject Site is not conducive with the species habitat requirements, the Subject Site lacks termite mounds, bird nests and sheltering structures. The species is unlikely occur.	Not present. The species lays up to 14 eggs in a termite mound; the hatchlings dig themselves out of the mounds. No such habitat exists within the Subject Site.	Negligible, no anticipated impact to foraging or breeding habitat.	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Vespadelus troughtoni</i> (Eastern Cave Bat)	Vulnerable	-	Low.	Little is understood of its feeding or breeding requirements or behaviour. Species roosts in caves that is usually found in dry open forest and woodland, near cliffs or rocky overhangs; has been recorded roosting in disused mine workings, occasionally in colonies of up to 500 individuals. Some foraging habitat may occur within the Subject Site.	Not present, the species roosts in caves. No such habitat exists within the Subject Site.	Negligible impact to foraging habitat. No anticipated net loss of breeding habitat.	No



#### 4.2.1 Migratory Fauna Species

The likelihood of occurrence of threatened migratory fauna species within or around the Subject Site is presented in **Table 8**. It was deemed that the proposed works will have no significant impact on these species; therefore, a Referral to the Commonwealth pursuant to the EPBC Act is not required.

#### Table 8. Assessment of likely occurrence of threatened migratory fauna species within the Subject Site

Species	BC Act	EPBC Act	Likelihood of Occurrence	Required foraging habitat and presence within the Subject Site	Required breeding habitat and presence within the Subject Site	Further Impact Assessment Required?
<i>Cuculus optatus</i> (Oriental Cuckoo)	-	Migratory	Low	This species is found primarily in monsoon forest, rainforest edges, and leafy trees in paddocks. No such foraging habitat occurs within the Subject Site.	This species does not breed in Australia.	No
Hirundapus caudacutus (White-throated Needletail)	-	Migratory; Vulnerable	Low	This species is primarily aerial and are mostly recorded above wooded areas. The Subject Site contains tree species that this species may forage above.	This species does not breed in Australia.	No
<i>Monarcha</i> <i>melanopsis</i> (Black-faced Monarch)	-	Migratory	Low	This species is found primarily in rainforest ecosystems and wet sclerophyll forests. No such foraging habitat occurs within the Subject Site.	This species breeds in rainforest habitat. No such breeding habitat occurs within the Subject Site.	No
<i>Monarcha</i> <i>trivirgatus</i> (Spectacled Monarch)	-	Migratory	Low	The Spectacled Monarch feeds on insects, foraging mostly below the canopy in foliage and on tree trunks or vines. Potential foraging habitat does exist within the Subject Site.	The Spectacled Monarch builds a small cup nest of fine bark, plant fibres, moss and spider web in a tree fork or in hanging vines, 1 m - 6 m above the ground, often near water. No nests were identified during site assessment	No
<i>Motacilla flava</i> (Yellow Wagtail)	_	Migratory	Low	This species primarily occurs in open country near swamps, salt marshes, and sewage ponds. No such foraging habitat occurs within the Subject Site.	This species does not breed in Australia.	No
Myiagra cyanoleuca	-	Migratory	Low	This species primarily occurs in heavily vegetated gullies in eucalypt-dominated forest and tall	This species primarily inhabits heavily vegetated gullies in eucalypt-dominated	No



Species	BC Act	EPBC Act	Likelihood of Occurrence	Required foraging habitat and presence within the Subject Site	Required breeding habitat and presence within the Subject Site	Further Impact Assessment Required?
(Satin Flycatcher)				woodlands. No such foraging habitat occurs within the Subject Site.	forest and tall woodlands. Sub-optimal breeding habitat occurs within the Subject Site however, no nests were identified during site assessment.	
<i>Rhipidura rufifrons</i> (Rufous Fantail)	-	Migratory	Low	This species primarily occurs in wet sclerophyll forests and occasionally drier sclerophyll forests and woodlands. It feeds on insects, which it gleans from the middle and lower levels of the canopy. No such foraging habitat is present on the Subject Site.	This species breeds at elevations >600 m above sea level. No such breeding habitat occurs within the Subject Site.	No



### 5. Impact Summary

#### 5.1 Vegetation Removal

The proposed development is situated in an area mapped by Narla as 'Planted Natives and Exotics'. The proposed development will see the clearing of twenty-three native trees (23), including:

- 15x Eucalyptus tereticornis;
- 1x Glochidion ferdinandi;
- 1x Lophostemon confertus;
- 1x Eucalyptus robusta;
- 1x Eucalyptus resinifera;

- 1x Eucalyptus haemastoma;
- 1x Angophora costata;
- 1x Eucalyptus scias; and
- 1x Corymbia gummifera.

The proposed development will also see the removal of three (3) trees listed as an 'Exempt Tree Species' within the Northern Beaches LGA (Northern Beaches Council 2015):

- 2x Cinnamomum camphora; and
- 1x Eucalyptus scoparia.

The proposed development will see the additional pruning of four (4) native tree species including:

• 2x Eucalyptus tereticornis;

• 1x Eucalyptus scias.

• 1x Corymbia gummifera; and

#### 5.2 Revegetation

The proposal also involves revegetation works to result in a net gain of native trees species within the Subject Property. The proposed plantings comprise a diverse range of locally indigenous species and includes the planting of forty-two (42) native tree species including (Arcadia 2021b):

• 10x Banksia integrifolia;

• 6x Tristaniopsis laurina; and

7x Eucalyptus haemastoma;

• 19x Corymbia gummifera

Proposed revegetation works will also include a large assemblage of native shrub and ground cover species, a full list of species with planting quantities is presented in **Appendix C** (Arcadia 2021b).



### 6. Recommendations

#### 6.1 Impact Mitigation and Minimisation Recommendations

This section of the report details recommended efforts to avoid and minimise impacts on biodiversity values associated with the proposed development. Measures to be implemented before, during, and post construction are detailed in **Table 9**.

#### Table 9. Measures to be implemented before, during and after construction to avoid and minimise the impacts of the proposed development

Action	Outcome	Timing	Responsibility
Project Location, Design and Planning	The design of the proposed development will require the removal of twenty-four (24) native trees as well as two (2) exotic trees. To offset this impact the proponent has created a planting schedule (Arcadia 2021b; <b>Appendix C</b> ) that will see the planting of forty-two (42) native trees along with numerous other native shrubs and groundcovers. The position of the proposed development is deemed likely have minimal potential impacts on biodiversity values, provided the following mitigation measures are followed.	Pre- construction phase	Proponent
Assigning a project Ecologist	<ul> <li>Prior to the construction phase of the development, the proponent may be required to commission the services of a qualified and experienced Ecologist with a minimum tertiary degree in Science, Conservation, Biology, Ecology, Natural Resource Management, Environmental Science or Environmental Management.</li> <li>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.</li> <li>If required by Council, the Ecologist will be commissioned to: <ul> <li>Help the applicant undertake any threatened species habitat augmentation or translocation;</li> <li>Undertake any required targeted searches for threatened flora prior to vegetation clearing;</li> <li>Undertake an extensive pre-clearing survey; delineating habitat-bearing trees and shrubs to be retained/removed; and</li> </ul> </li> <li>Supervise the clearance of trees and shrubs (native and exotic) in order to capture, treat and/or relocate any displaced fauna.</li> </ul>	Pre- construction phase	Proponent



Action	Outcome	Timing	Responsibility
Tree Protections	<ul> <li>Australian Standard 4970 (2009) Protection of Trees on Development Sites (AS-4970) outlines that a Tree Protection Zone (TPZ) is the principal means of protecting trees on construction sites. It is an area isolated from construction disturbance so that the tree remains viable. Ideally, works should be avoided within the TPZ.</li> <li>A Minor Encroachment is less than 10% of the TPZ and is outside the structural root zone (SRZ). A Minor Encroachment is considered acceptable by AS-4970 when it is compensated for elsewhere and contiguous within the TPZ.</li> <li>A Major Encroachment is greater than 10% of the TPZ or inside the SRZ. Major Encroachments generally require root investigations undertaken by non-destructive methods or the use of tree sensitive construction methods.</li> </ul>	Pre- construction phase	Proponent Arborist
Erosion and Sedimentation	Appropriate erosion and sediment control must be erected and maintained at all times during construction in order to avoid the potential of incurring indirect impacts on biodiversity values. As a minimum, such measures should comply with the relevant industry guidelines such as 'the Blue Book' (Landcom 2004).	Construction phase	Proponent Construction Contractor
Landscaping	All landscaping works should be in accordance with the Proposed Tree Canopies Plan (Arcadia 2021a) and 'Plant Schedule (Arcadia 2021b).	Construction phase	Proponent
Storage and Stockpiling (Soil and Materials)	Allocate all storage, stockpile, and laydown sites away from any vegetation that is planned to be retained. Avoid importing any soil from outside the site as this can introduce weeds and pathogens to the site in order to avoid the potential of incurring indirect impacts on biodiversity values.	Construction phase	Construction Contractors
Stormwater	The proposed development is unlikely to result in significant changes to local storm-water runoff so it is expected there will be no exacerbated impact on native species of flora and fauna.	Post- construction phase	Proponent Construction Architect



Action	Outcome	Timing	Responsibility
Sewerage	All sewerage produced on site will be contained in an appropriate sewerage system. Containing all sewerage produced on site within a certified sewerage system will eliminate any adverse effects to the local ecology. The proposed sewer line is to avoid tree roots and tree protection zones.	Post- construction phase	Proponent



# 7. Conclusion

This assessment indicates that the relevant biodiversity conservation provisions of the Environmental Planning and Assessment Act 1979 and the relevant provisions of the PLEP and the PDCP have been fulfilled.

No threatened ecological communities, fauna or flora species or populations are expected to be significantly impacted as a result of the proposed development.

In summary, the proposed development will require the removal of twenty-six (26) trees of which three (3) are listed as an 'Exempt Tree Species' within the Northern Beaches LGA (Northern Beaches Council 2015). The revegetation of the Subject Property will involve the planting of forty-two (42) native tree species resulting in a net gain of native tree species abundance. Revegetation works will also include the planting of numerous shrub and groundcover species (**Appendix C**), vastly improving the biodiversity of the Subject Property. The proposed planting schedule will also result in a net gain of food resources for the Grey-headed Flying Fox within the Subject Property.

If the appropriate recommendations in this report are followed, the proposed development will have minimal ecological impacts.



### 8. References

Australian Standard 4970 (2009) Protection of Trees on Development Sites (AS-4970)

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### 9. Appendices

Appendix A. Flora species identified within the Subject Site.

Appendix B. Fauna species identified within and surrounding the Subject Site.

Appendix C Planting Schedule for Mona Vale Public School (Arcadia 2021b).

Appendix D Biodiversity Conservation Act 2016- Assessment of Significance (5-Part Test).

Appendix E Commonwealth Environment Protection and Biodiversity Conservation Act 1999 Assessment of Significant Impact Criteria.



Appendix A.	Flora sp	ecies ide	entified w	vithin th	e Subject Site.
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Scientific Name	Canopy	Mid-Story	Ground	Status
Angophora costata	x			
Cinnamomum camphora*	x			
Corymbia gummifera	x			
Ehrharta erecta*			x	
Eucalyptus haemastoma	x			
Eucalyptus resinifera	x			
Eucalyptus robusta	x			
Eucalyptus scias	x			
Eucalyptus scoparia	x			BC Act Endangered EPBC Act Vulnerable
Eucalyptus tereticornis	x			
Glochidion ferdinandi	x			
Lagerstroemia spp.*		x		
Lomandra longifolia			x	
Lophostemon confertus	x			
Cenchrus clandestinus*			x	
Sida rhombifolia*			x	
Sonchus oleraceus*			x	
Sporobolus africanus*			x	
Stenotaphrum secundatum*			Х	
Syzygium spp.		x		
Taraxacum officinale*			Х	

\* Denotes exotic species



#### Appendix B. Fauna species identified within and surrounding the Subject Site.

Class	Scientific Name	Common Name	Status
Aves	Corvus coronoides	Australian raven	
	Cracticus tibicen	Australian magpie	
	Dacelo novaeguineae	Laughing Kookaburra	Protected
	Manorina melanocephala	Noisy miner	-
	Trichoglossus moluccanus	Rainbow lorikeet	



#### 20-716 MONA VALE PUBLIC SCHOOL PLANT SCHEDULE

CODE	BOTANIC NAME	COMMON NAME	MATURE SIZE (hxw)(m)	PROPOSED POT SIZE	QUANTITY
-		$\overline{}$		$ \sim $	
	TREES & PALMS		15.0	0001	40
BI	Banksia integrifolia	Coastal Banksia	15 x6	200L	10
Cg	Corymbia gummifera	Red Bloodwood	20 x10	400L	19
Eh	Eucalyptus haemastoma	Scribbly Gum	15 x 10	400L	7
	Tristaniopsis laurina	Water Gum	7x5	400L	6
	ADDITIONAL TREES		10 10		
Up	Ulmus parvifolia	Chinese Elm	13 x 10		1
Apa	Acerpalmatum	Japanese Maple	4x4		2
Cav	Callistemon viminalis	Bottlebrush	4 x 2	200L	5
			$\wedge$	$\land$	
-	SHRUBS & ACCENTS				
Be	Banksia ericifolia	Heath Banksia	1.5 x 1.5	300mm	20
Br	Bauera rubioides	River Roses	1 x 1	300mm	176
Cs	Crowea saligna	Pink Crowea	1 x 0.8	300mm	13
GI	Grevillea linearifolia	White Spider Flower	2 x 2	300mm	94
Pm	Philotheca myoporoides	Long-leafed Wax Flower	2 x 1	300mm	19
Rs	Rhagodia spinescens	Aussie Flat Bush	0.3 x 1	300mm	440
Wf	Westringia fruticosa	Coastal Rosemary	1 x 1	300mm	62
Zs	Zieria smithii	Sandfly Bush	2 x 1.5	300mm	12
	GRASSES & RUSHES				
Dc	Dianella caerulea	Blue Flax Lilly	1 x 1.5	150mm	646
Fn	Ficinia nodosa	Knobby Club Rush	1 x 0.8	150mm	142
Ju	Juncus usitatus	Sedge	1.2 x 0.5	150mm	320
Lla	Lepidosperma laterale	Sword-sedge	1 x 0.35	150mm	145
Llo	Lomandra longifolia	Mat Rush	0.6 x 1	150mm	667
Pa	Poa affinis	Tussock Grass	0.8 x 0.8	150mm	1061
PI	Poa labillardieri 'Eskdale'	Tussock Grass	0.5 x 0.5	150mm	506
Та	Themeda australis	Kangaroo Grass	1 x 0.3	150mm	585
	FERNS & CYCADS				
Aa	Adiantum aethiopicum	Maidenhair Fern	0.8 x 0.9	300mm	189
Cd	Calochlaena dubia	Soft Bracken Fern	0.6-2m x 0.9-1.5	300mm	728
Hi	Histiopteris incisa	Bat's Wing Fern	1 x 2	300mm	217
Pe	Pteridium esculentum	Bracken Fern	0.6-1.5 x 1	300mm	172
	GROUNDCOVERS & CLIMBERS				
Ah	Actinotus helianthi	Flannel Flower	0.3 x 0.4	150mm	294
Bs	Billardiera scandens	Apple Berry	1.5 x 3	150mm	269
Cas	Centella asiatica	Centella	0.2 x 1	150mm	428
Car	Clematis aristata	Old Mans Beard/Travellers Joy	0.2 x 2	150mm	483
Dr	Dichondra repens	Kidney Weed	0.3 x 5	150mm	367
Hv	Hardenbergia violacea	False Sarsaparilla	0.2 x 3	150mm	563
Pp	Pratia purpurascens	White Boot	0.2 x 1	150mm	409
Pa	Pelaroonium australe	Native Geranium	0.5 x 0.3	150mm	300
Wfm	Westringia fruticosa 'Mundi'	Coastal Rosemary	0.5 x 1	150mm	150
Vh	Viola hederacea	Native Violet	0.2 x 1	150mm	716
			Sie A I		710



Biodiversity Conservation	Act 2016– Assessment of Significance (5-part Test) for Grey-headed Flying-Fox ( <i>Pteropus poliocephalus</i> )				
BC Act Status: Vulnerable					
Species Ecology	Grey-headed Flying-fox forage opportunistically, often at distances up to 30 km from camps, and occasionally up to 60-70 km per night, in response to patchy food resources. This species is a canopy-feeding frugivore, blossom-eater and nectarivore of rainforests, open forests, woodlands, Melaleuca swamps and Banksia woodlands. As such, the species contributes important ecosystem function by providing a means of seed dispersal and pollination for many indigenous tree species. Grey-headed Flying-fox feed on introduced trees including commercial fruit crops. Grey-headed Flying-foxes congregate in large numbers at roosting sites (camps) that may be found in rainforest patches, Melaleuca stands, mangroves, riparian woodland or modified vegetation in urban areas. Individuals generally exhibit a high fidelity to traditional camps and return annually to give birth and rear offspring. The Grey-headed Flying-fox show a regular pattern of seasonal movement. Much of the population concentrates in May and June in northern NSW and Queensland where animals exploit winter-flowering trees such as Swamp Mahogany Eucalyptus robusta, Forest Red Gum E. tereticornis and Paperbark Melaleuca quinquenervia.				
(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,	<ul> <li>The proposed development is unlikely to adversely effect upon the life cycle of the species.</li> <li>At the time of preparing this report there were no known roosts or camps of Grey-headed Flying-fox within the Subject Site, however, a known roosting camp occurs approximately 1km away from the Subject Site. The proximity of the roosting camp may increase the importance of the intermittent potential foraging habitat within the Subject.</li> <li>24 trees that may provide foraging habitat are to be removed for the proposed development. The vegetation has been historically planted. Extensive suitable potential habitat for the species will remain within the broader Subject Property and in the locality.</li> <li>The proposed development will not cause a significant loss in habitat resources and therefore will not have an adverse effect such that will be likely to reduce the viability of a local population, such that the species is likely to be placed at risk of extinction.</li> </ul>				

#### Appendix D Biodiversity Conservation Act 2016- Assessment of Significance (5-Part Test).



Biodiversity Conservation Act 2016– Assessment of Significance (5-part Test) for <b>Grey-headed Flying-Fox</b> ( <i>Pteropus poliocephalus</i> )				
BC Act Status: Vulnerable				
(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	<ul> <li>(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</li> </ul>	Not applicable – Grey-headed Flying Fox is not an ecological community.		
	<ul> <li>(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,</li> </ul>	Not applicable – Grey-headed Flying Fox is not an ecological community.		
(c) in relation to the habitat of a threatened species or ecological community:	<ul> <li>(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and</li> </ul>	i) 24 trees that may provide foraging habitat will require removal as a result of the proposed development.		
	(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and	<ul> <li>ii) The habitat available on the subject site for this species will not become fragmented from other areas as a result of the proposed development. As the species is highly mobile, minor loss of select trees within the subject site is not considered likely to</li> <li>significantly affect the species. Habitat connectivity will continue to occur across the greater landscape.</li> </ul>		
	(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,	iii) The proposed development will be situated predominantly historically altered landscape that would only provide intermittent foraging habitat for the species in comparison to the extensive potential foraging habitat provided by in the broader locality.		



Biodiversity Conservation Act 2016– Assessment of Significance (5-part Test) for <b>Grey-headed Flying-Fox</b> ( <i>Pteropus poliocephalus</i> )		
BC Act Status: Vulnerable		
<ul> <li>(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),</li> </ul>	The development is not likely to have an adverse effect on any declared area of outstanding biodiversity value, directly or indirectly.	
(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	The KTPs relevant to these species within the Subject Site are: Clearing of native vegetation	
Conclusion		
There will be no significant impact on the Grey-headed Flying Fox ( <i>Pteropus poliocephalus</i> ) therefore the proposed development should not warrant the producing of a Biodiversity Development Assessment Report.		
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Commonwealth Environment Protection and Biodiversity Conservation Act 1999				
Assessment of Significant Impact Criteria				
for the				
Grey-heade	ed Flying Fox			
(Pteropus p	oliocephalus)			
EPBC Act Status: Vulnerable				
Significant impact criteria An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:				
• lead to a long-term decrease in the size of an important population	The proposed development will not result in a long- term decrease in the size of an important population of Grey-headed Flying-foxes.			
	An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are: key source populations either for breeding or dispersal; populations that are necessary for maintaining genetic diversity, and/or; populations that are near the limit of the species range.			
	No important population were located within or surrounding the Subject Site.			
	The proposed development will involve the removal of 24 trees from within the Subject Site that may provide intermittent foraging habitat for this species.			
	It is not believed that this removal of potential intermittent foraging habitat will result in the long-term decrease in the size of an important population, when considering the extensive suitable foraging habitat that will remain within the locality.			
<ul> <li>reduce the area of occupancy of an important population</li> </ul>	The proposed development will not reduce the area of occupancy of an important population. No existing roosts exist within the Subject Site. The vegetation is only deemed likely to provide intermittent foraging habitat for these species. Extensive similar habitat will remain within the locality. Therefore, it is deemed unlikely that the proposed development would result in a reduced area of occupancy for the important population.			
<ul> <li>fragment an existing important population into two or more populations</li> </ul>	Whilst the proposed development might result in the removal of intermittent foraging habitat there is no risk of fragmentation of a population.			
• adversely affect habitat critical to the survival of a species	The development will not adversely affect habitat critical to the survival of this species. No existing roost camps exist within the Subject Site. As the subject site only provides limited and intermittent foraging			

Appendix E Commonwealth Environment Protection and Biodiversity Conservation Act 1999 Assessment of Significant Impact Criteria.



Commonwealth Environment Protection and Biodiversity Conservation Act 1999			
for the			
Grey-headed Flying Fox			
(Pteropus poliocephalus)			
	resources, it is not considered critical habitat for the survival of the species.		
• disrupt the breeding cycle of an important population	The proposed development will have no impact on the breeding cycle of a population.		
• modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed development will not modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that Grey-headed flying foxes are likely to decline.		
	The proposed development will involve the removal of 24 trees from within the Subject Site that may provide intermittent foraging habitat for the species. This is not expected to significantly impact the species when considering the extensive potential foraging habitat that will remain within the locality.		
<ul> <li>result in invasive species that are harmful to the vulnerable species becoming established in the vulnerable species' habitat</li> </ul>	Invasive predators including foxes or cats have some potential to access site currently. Proposed works are considered unlikely to exacerbate predation by exotic predators.		
• introduce disease that may cause the species to decline, or	The proposed development is deemed unlikely to introduce disease that will cause any of these species to decline.		
• interfere with the recovery of the species.	The proposed development will not interfere substantially with the recovery of the Grey-headed Flying Fox. The proposed development will involve the removal of 24 trees from within the Subject Site that may provide intermittent foraging habitat for the species. This is not expected to significantly impact the species when considering the extensive potential foraging habitat that will remain within the locality. In addition, all native trees proposed for removal will be replaced.		

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