Narrabeen Education Precinct - Ecological Assessment

North Narrabeen, NSW

Prepared for: School Infrastructure NSW

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Document Information

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For and on behalf of,
ADE Consulting Group Pty Ltd

Prepared and Issued by:

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1 Introduction

1.1 Background and General Information

ADE Consulting Group (ADE) was commissioned by School Infrastructure NSW (SINSW) to undertake an Ecological Assessment of the Narrabeen School Precinct located at 6 Namona Street (Narrabeen North Public School (NNPS)) and 10 Namona Street (Narrabeen Sports High School (NSHS)), North Narrabeen, New South Wales 2101 (the "Subject Site").

This report has been prepared to address the requirements of the NSW *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

A site inspection undertaken on 1st December 2021, followed by a floristic survey undertaken on the 6th July 2022. The location of the Subject Site is shown in **Figure 1** and the location where the proposed removal of three trees for proposed re-development of the Binidomes on the Narrabeen Public School site and three trees for the gymnasium construction on the Narrabeen Sports High School are shown in **Figure 2** and **Figure 3**.

Table 1 Summary of Site Information

Site Details	
Client Name:	School Infrastructure NSW
ADE Project Number:	A403021.1595.00
Site Address:	6 Namona Street, North Narrabeen, New South Wales 2101 10 Namona Street, North Narrabeen, New South Wales 2101
Date of Field Surveys:	1st December 2021 (Fauna) and 6 July 2022 Flora.
Date of Report:	16th September 2022
Study Area:	Area within 1.5 km of the Narrabeen North Primary School and Narrabeen Sports High School

1.2 Report Author

This report has been prepared by Mr Richard Floyd, Principal Ecologist with ADE Consulting. Richard has more than 28 years of ecological consulting throughout Australia, with a more recent focus in New South Wales and Queensland. Richard's CV is included as **Appendix A** to this report.

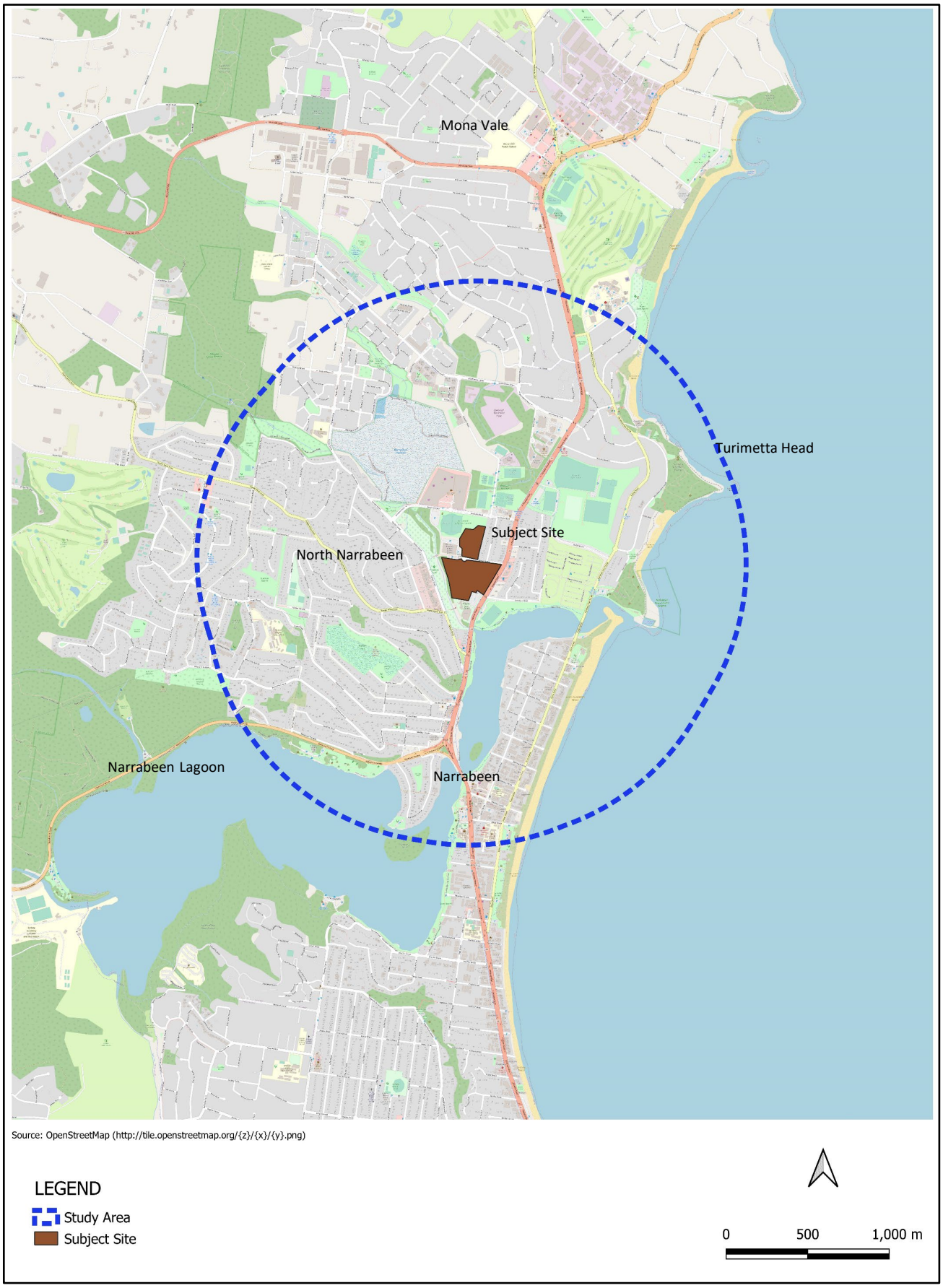

Figure 1 - Location of the Subject Site and Study Area

1.3 Proposed Development

1.3.1 Proposal

The proposed Narrabeen Education Precinct development includes redevelopment of Narrabeen North Public School (NNPS) and Narrabeen Sports High School (NSHS). The Public School and High School have been identified by the NSW Department of Education (DoE) as requiring upgrade works.

The works at NSHS upgrade the school including addition of a new two (2) storey extension to Building A, construction of new single storey amenities building and refurbishment of four (4) existing buildings (Buildings A, B, C and K).

The Development Application (DA) will seek consent for the following works at NNPS & NSHS:

- The works the subject of the Development Application (DA) at NNPS comprise:
    - Construction of a new two (2) storey building containing administration facilities, multi-purpose hall and out-of-school-hours care (OSHC) facility on the ground floor with staff facilities and amenities on the first floor; and
    - New Covered Outdoor Learning Area (COLA).
- The works the subject of the DA at NSHS comprise:
    - Alterations and additions to Building A (Gymnasium) to create new stage for gymnasium and new two (2) storey addition comprising canteen, boys and girls changing rooms and staff room on the ground floor; and movement studio and two (2) new General Learning Spaces (GLS) on the first floor.

Other development works are occurring on the site under separate planning pathways including:

- Development without consent (REF); and
- Exempt development

The proposed development does not seek to increase staff or student numbers.

This report has been prepared to address the ecological reporting requirements for the removal of three tress for the redevelopment of the Binidomes on the NNPS site (**Figure 2**) and for the removal of three trees for the gymnasium development (**Figure 3**) on the NSHS site.

Figure 2 **Proposed Narrabeen North Primary School Layout**

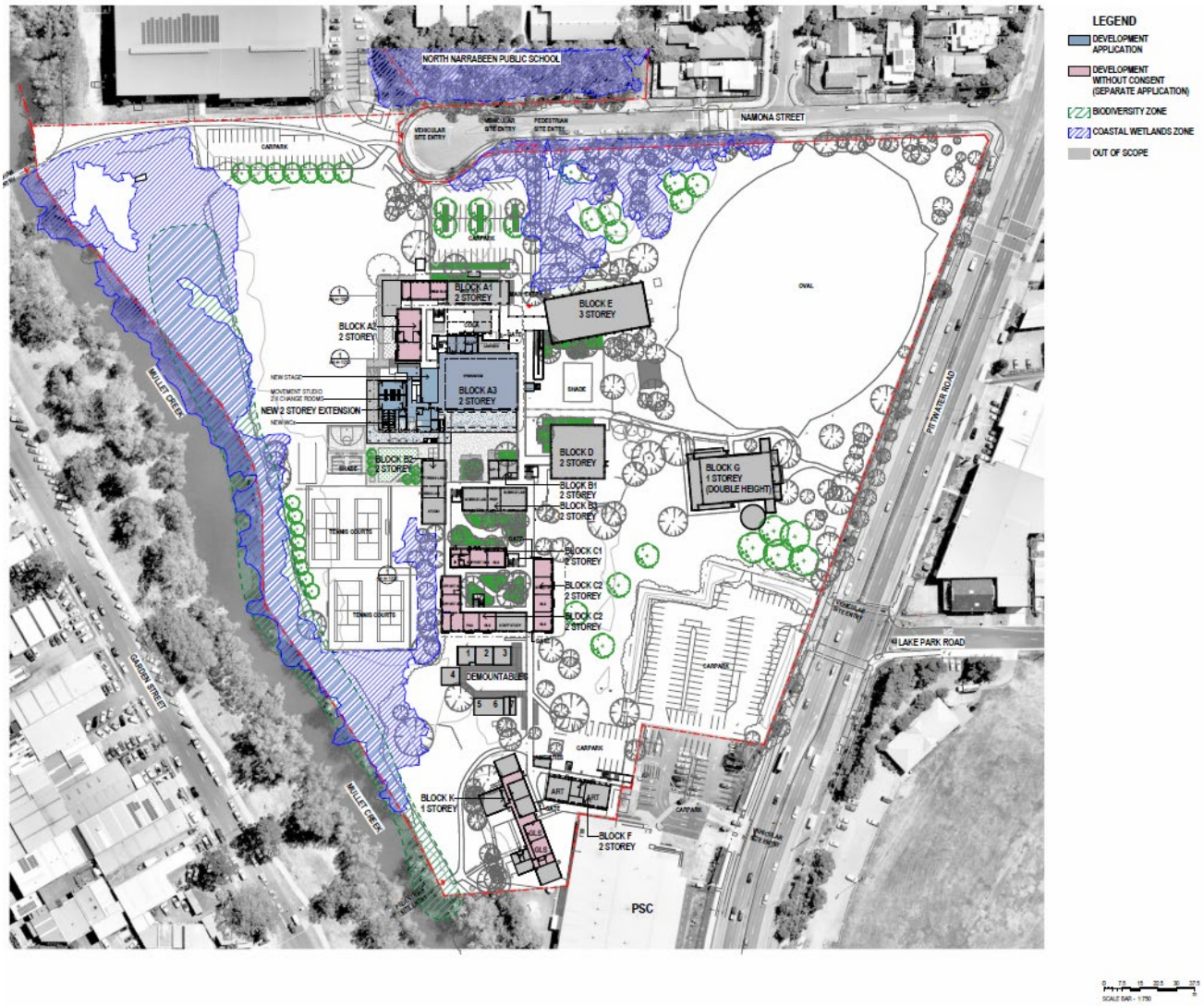

Figure 3 **Narrabeen Sports High School**

1.3.2 Site Description

The Subject Site is located at 6 and 10 Namona Street, North Narrabeen (referred to as the Narrabeen Education Precinct) and falls within the local government area of Northern Beaches Council. The Narrabeen Education Precinct has a total area of 9.84 hectares.

Narrabeen North Public School (NNPS) is located on the northern side of Namona Street, North Narrabeen and is legally described as Lot 3 Deposited Plan (DP) 1018621. NNPS is surrounded by residential dwellings to the east, grassed sporting fields (Warriewood Valley Sportsground) to the north and Northern Beaches Indoor Sports Centre to the west. NNPS contains two (2) Binishell domes (Block A and Block B) which are identified as a local heritage item under the Pittwater Local Environmental Plan 2014. The two (2) Binishell Domes are listed as State significant on DoE's Section 170 Heritage and Conservation Register. The Double Binishell Dome (Block B) is listed on the State Heritage Register (SHR). It is understood that three trees will be impacted by the proposed works associated with the Binishell Domes (Trees 55, 57 and and 58 on **Figure 4**).

Figure 4 Tree Plan of NNPS(from Independent Arborists Report (2022)

Narrabeen Sports High School (NSHS) is located on the southern side of Namona Street and is legally described as Lot 12 DP 1119562. NSHS is surrounded by Pittwater Road to the east, Pittwater Sports Centre to the south and Mullet Creek to the west. It is understood that tree's 65, 66 and 67 (on **Figure 5**) will require removal for construction of the proposed gymnasium.

In summary, in order to undertake the proposed works the subject of this Development Application, it is understood that 3 tree will be removed from the NNPS site and 3 trees will be removal from the NSHS site. These trees are shown within the Independent Arborist (2022) Reports and the ecological impacts of their loss are assessed within this report.

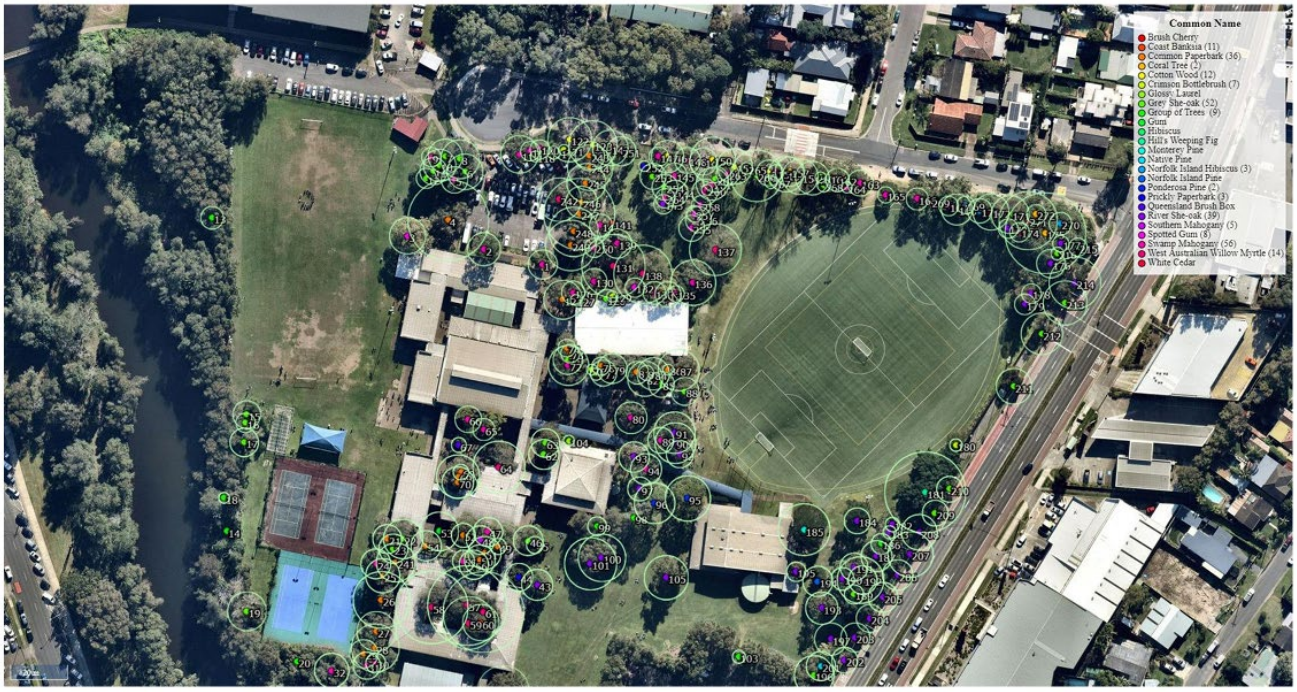

Figure 5 Trees present throughout the NNSH site (from Independent Arborists Report (2022)

1.4 Study Aims and Objectives

The aim of this assessment was to determine the presence of ecological values associated with the proposed tree removal within the Subject Site and determine a significant impact would result on these values as a consequence of the proposed development.

The study objectives included the following:

- describe the vegetation communities present on the property
- detail fauna habitat and its occurrence on the property
- assess the likelihood of occurrence of threatened species on the property; and
- assess potential impacts of the project on threatened species or communities and propose mitigation measures to eliminate, minimise or offset any residual impacts from the proposed development.

1.5 Survey Limitations

Vertebrate fauna and vascular flora of the locality are well known based upon a sizeable database of past records. The survey by ADE added to the existing database and helped to provide a clear indication of the likelihood that various species occur or are likely to occur within the Subject Site. The data obtained from database assessment and survey of the Subject Site furnished an appropriate level of information to support this assessment.

The weather conditions at the time of the initial field inspection and the later floristic survey were generally favourable for plant growth and production of features required for identification of most species. The secondary floristic survey while undertaken in winter, was able to identify to species level. Shrubs, grasses, herbs and creepers were readily identifiable in most instances. It is expected that not all flora species present would have been recorded during surveys. Despite this, it is considered that sufficient information has been collected to assess issues including conservation significance of the flora, condition and viability of vegetation and likely impact on native vegetation. An assessment of the likelihood of occurrence of threatened flora species recorded within the locality of the Subject Site in the database searches was undertaken to supplement the flora survey.

No targeted fauna surveys were undertaken for this assessment, which relied solely on a database analysis and fauna habitat assessment. The data produced by the survey is intended to be indicative of the types of species that could occur within the Subject Site. An assessment of the likelihood of occurrence of threatened and migratory fauna species listed for the locality in the database searches was undertaken to supplement the habitat assessment. The combination of these techniques is considered appropriate for assessing the habitat values for threatened fauna within the Study Area.

2 Regulatory Framework

2.1 Commonwealth

2.1.1 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth of Australia identifies threatened flora, fauna and ecological communities under the EPBC Act to provide protection to matters of national environment significance (MNES) including, but not limited to, threatened species, threatened ecological communities (TEC) and migratory species. Should a listed matter be significantly impacted, the Minister of the Environment must approve the activity causing the impact. Where there is the potential for significant impacts the action must be referred to the Department of Agriculture, Water and Environment for a decision as to whether the approval of the Minister is required.

2.1.2 International Treaties and Agreements

Australia is a signatory to the Japan–Australia (JAMBA), Republic of Korea–Australia (ROKAMBA), China – Australia (CAMBA) Migratory Bird Agreements and the Bonn Convention on the Conservation of Migratory Species of Wild Animals. JAMBA, ROKAMBA and CAMBA require the parties to protect migratory birds by:

- Limiting circumstances under which migratory birds are taken or traded
- Protecting and conserving important habitats
- Exchanging information; and
- Building cooperative relationships.

This assessment will identify those migratory species that may potentially be impacted by the proposed development. Marine mammals and avian pelagic (open sea) species have not been considered in this assessment.

2.2 New South Wales

2.2.1 Biodiversity Conservation Act 2016

The NSW *Biodiversity Conservation Act 2019* (BC Act) is the primary legislation that identifies and protects threatened species populations and ecological communities in NSW. The BC Act relaces the former *Threatened Species Conservation Act* 1995, the *Nature Conservation Trust Act* 2001 and the sections of the *National Parks and Wildlife Act* 1974.

Section 7.3 of the BC Act includes the test of significance to assess the likelihood of significant impacts upon listed species, populations or ecological communities listed under the act. The Test of Significance assesses the following:

- *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,*

- *in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity—*
    - *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*
    - *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,*
- *in relation to the habitat of a threatened species or ecological community--*
    - *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
    - *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*
    - *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,*
- *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),*
- *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.*

2.2.2 Biosecurity Act 2015

The NSW *Biosecurity Act 2015* (BS Act) details the obligations under this act to prevent, eliminate and minimise biosecurity risks posed by biosecurity matter. It also provides a framework for the timely and effective management of pests, diseases, contaminants and other biosecurity matters, threats to terrestrial and aquatic environments, and public health and safety risks arising from contaminants. The broad objectives for the BS Act are to manage biosecurity risks from animal and plant pests and diseases, weeds and contaminants by preventing their entry to NSW; quickly finding, containing and eradicating any new entries; and effectively minimising the impacts of those pests, diseases, weeds and contaminants that cannot be eradicated through robust management arrangements.

2.2.3 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act), provides the system of environmental planning and assessment for the state of New South Wales. The EP&A Act requires the relevant planning authority to take into consideration the impacts to the environment (natural and built) and also the community, of proposed development or land-use change. Relevant objects of the EP&A Act include promoting the social and economic welfare of the community and a better environment; facilitating ecologically sustainable development; promoting orderly and economic use and development of the land; and protecting the environment, including the conservation threatened and other species of native animals and plants, communities, and habitats.

2.2.4 State Environmental Planning Policy (Resilience and Hazards) 2021

The proposed development occurs within the Coastal Protection Zone and contains a mapped Wetland Area. This area is consistent with a mapped Biodiversity Value Area under the BC Act. The proposed development will not impact the Wetland Area.

2.2.5 State Environmental Planning Policy (Biodiversity and Conservation) 2021 – 'Chapter 2 – Vegetation in non-rural areas'

The aims of this Chapter of the SEPP are to:

(a) protect the biodiversity values of trees and other vegetation in non-rural areas of the State, and

(b) to preserve the amenity of non-rural areas of the State through the preservation of trees and other vegetation.

This Chapter requires that Council is required to issue a permit to allow for the removal of trees from the Subject Site.

This report has been prepared to outline that the vegetation to be removed is not consistent with a Plant Community Type and as such a clearing threshold is not available. Further to this, clearing will avoid the mapped wetland areas present within the Subject Site. An assessment has been undertaken in accordance with the Biodiversity Conservation Act to ensure that impacts from the clearing of vegetation from the site will not have any significant impacts upon any threatened flora, fauna or ecological community.

2.2.6 State Environmental Planning Policy (Biodiversity and Conservation) 2021 – 'Chapter 4 Koala habitat protection 2021'

The Subject Site is greater than 1 hectare in area, is zoned SP2 Infrastructure, and is located in the Northern Beaches Local Government Area, this SEPP therefore applies. The principles of the Chapter 4 of the SEPP are to help koalas thrive by ensuring koala habitat is properly considered during the development assessment process, and to provide a process for councils to strategically manage koala habitat through the development of koala plans of management. Section 5.4 of this report makes an assessment of this SEPP.

2.2.7 State Environmental Planning Policy (Biodiversity and Conservation) 2021 – 'Chapter 6 – Bushland in urban areas'

As the Subject Site occurs adjacent to Progress Park (and Mullet Creek) Zoned RE1, the provisions of Chapter 6 of the SEPP apply. As no riparian vegetation will be impacted by any proposed construction activities, and as sedimentation and erosion control measures will be implemented during construction to ensure no indirect impacts occur, the requirements of this SEPP are addressed.

2.3 Local Planning Provisions

2.3.1 Northern Beaches (Pittwater) Local Planning Scheme

The development site is zoned SP2 (Infrastructure) in accordance with the Pittwater LEP. The entire development site is also mapped under the biodiversity layer of the LEP.

In accordance with Clause 7.6(3) of the Pittwater LEP, the following must be considered when determining a DA:

a) whether the development is likely to have

   I. any adverse impact on the condition, ecological value and significance of the fauna and flora on the land, and

   II. any adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna, and

   III. any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land, and

   IV. any adverse impact on the habitat elements providing connectivity on the land, and

b) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development. The proposed development has been assessed in accordance with the BAM, following the principles of avoid minimise and mitigate which encompasses the above considerations.

This ecological assessment has been prepared to address these criteria.

Further to this, Northern Beach Council has identified a list of tree species that do not require consent for removal. This list was consulted during the preparation of this report.

2.3.2 Pittwater 21 Development Control Plan (DCP)

The Pittwater 21 DCP contains provisions relating to native vegetation. Section B4.2 Flora and Fauna Conservation Category 1 and Wildlife Corridor and Section B4.8 Freshwater Wetland Endangered Ecological Communities list the following controls:

- Development shall retain and enhance habitat for threatened species, endangered populations, endangered ecological communities and other locally native species.
- Development shall provide wildlife corridors via creation, restoration, and / or regeneration of habitat.
- Development shall result in no significant onsite loss of canopy cover and no net loss in native canopy trees.
- Development shall ensure that at least 80% of any new planting incorporates native vegetation (as per species listed in Native Plants for Your Garden available on the Pittwater Council website). Landscaping

is to be outside areas of existing bushland and should not include environmental weeds. Development shall provide an adequate buffer to wildlife corridors.

- Caretakers of domestic animals shall prevent them from entering wildlife habitat areas.
- Fencing, where permitted, shall be passable by native wildlife.

Section B4.6 Wildlife Corridors lists the following controls:

- Development shall not directly impact on / or significantly reduce / degrade habitat for locally native species, threatened species, endangered populations or endangered ecological communities.
- Development shall retain, and provide an adequate buffer to, wildlife corridors.
- Development shall provide wildlife corridors via creation, restoration, and / or regeneration of habitat.
- Development shall not result in a significant loss of canopy cover or a net loss in native canopy trees.
- Development shall ensure that at least 60% of any new planting incorporates native vegetation (as per species listed in Native Plants for Your Garden available on the Pittwater Council website). Landscaping is to be outside areas of existing bushland and not include environmental weeds.
- Planting is to maximise linkage within the wildlife corridor.
- Caretakers of domestic animals shall prevent them from entering areas of wildlife habitat.
- Fencing, where permitted, shall be passable by native wildlife.

Section B4.22 Preservation of Trees and Bushland Vegetation states the following:

> *"Authority to clear a tree or other vegetation is regulated in this plan in accordance with State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 i.e. 'Vegetation SEPP'. In particular, Part 2 of the Vegetation SEPP sets out the authority to clear vegetation and Part 3 provides for Council to declare under this DCP when a Vegetation Clearing Permit may be issued for clearing of vegetation… An authority to clear vegetation is not required under the Vegetation SEPP:*
>
> I. *if it is clearing authorised by development consent i.e. a 'DA' under Part 4 of the Environmental Planning and Assessment Act 1979. Note: However, this authority to clear vegetation without a permit does not extend to clearing merely because it is a part of or ancillary to the carrying out of exempt development (see clause 8(1) of Vegetation SEPP).*
>
> II. *if it is clearing of a kind that is an activity authorised by an approval or carried out by a determining authority within the meaning of Part 5 of the Environmental Planning & Assessment Act after compliance with that Part.*
>
> III. *if the clearing was an emergency firefighting act or emergency bush fire hazard reduction work within the meaning of the Rural Fires Act 1997 (the 'Act'), or bush fire hazard reduction work to which section 100C(4) of the Act applies or vegetation clearing work under section 100R of the Act."*

The proposed development has been assessed in accordance with the requirements under Part 4 of the EP&A Act which encompasses the above considerations. Where feasible flora, fauna and ecological communities have been avoided where practicable. While some trees will be cleared as a component of this development, every effort has been made to retain the larger more intact areas of vegetation as well as the vegetation along Mullet Creek.

3 Methodology

3.1 Literature Review

The desktop assessment for this report was undertaken on the 11 July 2022 and included a review of Commonwealth and State government databases as well as various interest groups as listed below:

- The Department of Environment (DoE) Protected Matters Search Tool which was used to identify MNES within a 10 km radius of a central point of the Subject Site (-33.699819 latitude, 151.297730 longitude)
- The NSW Office of Environment and Heritage (OEH) Atlas of NSW Wildlife was used to identify the occurrence of threatened flora and fauna species listed under the New South Wales (NSW) (BC Act) recorded previously within 10 km of the Subject Site
- NSW Government Biodiversity Values Map which identifies areas of high biodiversity values which are sensitive to development impacts.

3.2 Site Surveys

3.2.1 Field Inspection

An ecological field survey was undertaken by ADE Ecologist Duncan Meyer and Arborist Chantalle Brackenridge Hughes on the 1st December 2021.

3.2.2 Habitat Assessment

During the initial field inspection of the Subject Site, a fauna habitat assessment was undertaken by the ADE ecologist. This survey assessed all potential habitats present on the Subject Site. This included micro habitats such as tree hollows, fallen logs, rocks, dense lead litter, dense shrubs, possum dreys, and nests for the presence of fauna species or the potential occurrence of fauna species. The survey also included an assessment of the presence of habitat features with the potential to house threatened fauna species known from the locality.

3.2.3 Floristic Survey

A detailed floristic survey was undertaken on the 6 July 2022 by Mr Isaac Mammot in accordance with the Biodiversity Assessment Methodology. This involved the survey of three survey plots on and adjacent to the Subject Site to allow classification of the vegetation communities present.

3.2.4 Incidental Observations

All fauna species seen or heard were recorded whilst on site. Additionally, any scats or scratches found in the Subject Site were assessed, and the associated species added to the species observed in the Subject Site.

4 Results

4.1 Literature Review Results

The Subject Site is located in the suburb of North Narrabeen approximately 20km north of the Sydney city centre. The Subject Site occurs adjacent to Mullet Creek which is identified as Biodiversity Value area under the BC Act. Warriewood Wetlands occur approximately 300m to the north of the Subject Site. A large shopping centre (Warriewood Square) and sporting fields separate Warriewood Wetlands from the Subject Site with a narrow linkage remaining along Mullet Creek.

In addition to the vegetation along Mullet Creek, the Subject Site also contains 2 areas of mapped Biodiversity Value Area (**Figure 6**). These areas are identified as Coastal Wetlands under the *State Environmental Planning Policy (Resilience and Hazards) 2021*.

4.1.1 Assessment of Mapped Native Vegetation Area (Ecologically Significant Areas)

Review of the Biodiversity Values areas (**Figure 6** below) mapping indicates that Biodiversity Value Areas are located along Mullet Creek and are identified as Coastal wetlands. Coastal Wetland is also identified as occurring on the Subject Site but will not be impacted by the proposed development. As the proposed works will not impact on any of these areas, a formal Biodiversity Assessment Report (BDAR) prepared in accordance with the BC Act is not required. Instead, this ecological assessment has been carried out, and contains a '7 Part Test of Significance' to ensure any impacts are assessed and then measures undertaken to avoid, minimise or offset any residual impacts.

4.1.2 Threatened Species

One threatened flora, *Eucalyptus scoparia* (Wallangarra Gum) was recorded on the Subject Site during the field surveys. This species naturally occurs in far northern New South Wales and Southern Queensland. This species has been extensively planted for urban gardens. This species is an exempt species in the Northern Beaches Local Government Area and can be cleared within approval provided it is not a heritage item or occurs within a heritage area. No other threatened flora species have been recorded on or adjacent to the Subject Site.

No fauna species have previously been identified as occurring on or adjacent to the Subject Site. Based on recorded sightings of flora and fauna species collected throughout the locality, and the identified presence or absence of specific habitats. As detailed in **Appendix B**, the Grey-headed Flying Fox (*Pteropus poliocephalus*), Southern Myotis (*Myotis macropus*), Fork-tailed Swift (*Apus pacificus*), Eastern Freetail Bat (*Micronomus norfolkensis*), Eastern Long-eared Bat (*Nyctophilus bifax*); and Powerful Owl (*Ninox strenua*) may have potential to occur on the Subject Site.

4.1.2.1 Flora

In total, 1,741 species from 202 Genera of flora have been recorded within a 5km radius of the Subject Site. Of these species, 741 species are identified as weed species and 32 are identified as threatened species under the BC Act. Review of the Commonwealth Protected Matters Database identified a further eight threatened flora species that may occur on or in the vicinity of the Subject Site.

None of the threatened flora species identified within 5 km of the Subject Site were observed during the field survey. Further to this, the more cryptic species (orchids) are considered unlikely to occur due to the historic and ongoing use of this area as a school ground.

Figure 6 **Biodiversity Value Area/Wetland Areas of the Subject Site**

4.1.2.2 Fauna

Based upon the likelihood of occurrence assessment undertaken in **Appendix B**, the following threatened species are assessed.

Bats

- Southern myotis (*Myotis macropus*)
- Eastern Free-tail Bat (*Micronomus norfolkensis*)
- Eastern Long-eared Bat (*Nyctophilus bifax*)
- Grey-headed Flying Fox (*Pteropus poliocephalus*)

Birds

- Fork-tailed Swift (*Apus pacificus*)
- Powerful Owl (*Ninox strenua*)

Although the above species have potential to occur on the property, the vegetation on the property is unlikely to be sufficient to support the nesting and roosting requirements of these species. Based upon the field survey undertaken together with the assessment of aerial imagery, some of these species have potential to occur in the local landscape and may utilise the site as a foraging resource. The likelihood of occurrence on the property of each species is outlined in **Appendix B**.

The impacts of the proposed works on these species are discussed in **Section 5**.

4.1.3 Wetlands and Watercourses

The Subject Site occurs adjacent to Mullet Creek. This creek is identified as a third order stream and occurs along the western boundary of the Subject Site.

The development site contains mapped Plant Community Type (PCT) 4027 Swamp Oak Swamp Forest Fringing Estuaries, Sydney Basin and South East Corner Bioregion along the riparian buffer of Mullet Creek as well as two patches of vegetation adjacent to Namona Street. This community is classified as a wetland in accordance with the Resilience and Hazards SEPP and falls under the vegetation formation of a forested wetland. This vegetation community is not located within the proposed development footprint. To ensure no impacts result on this community, it will be important to outline its presence, the implications of any associated construction activities occurring within the boundaries of this area on all construction personnel. This information should be outlined to all personnel prior to works commencing or personnel commencing work on the site.

4.2 Field Survey Results

4.2.1 General Ecological Values

Narrabeen North Public School

Narrabeen North Public School contains a number of potential habitat areas. The vegetation on site consists of predominantly large trees with a mowed grassy understory. A number of the trees within the site contain either hollows of artificial nest boxes (**Picture 1**). The nest boxes on this part of the Subject Site were confirmed to be occupied by Common Brushtail Possums (*Trichosurus vulpecula*) (**Picture 2**). The property also contains a number of heavily scratched up trees, indicating use by Brushtail Possums (**Picture 3**).

Picture 1: Hollow Bearing Tree

Picture 2: Common Brushtail Possum in Nest Box

Picture 3: Brushtail Possums Scratches

Narrabeen Sports High school

Narrabeen Sports High School contains multiple areas of differing vegetation communities and available habitat, from the large hollow bearing trees with a grassy understory within the school and the garden beds with vegetated understories to the vegetated creek line.

Mullet creek occupies the western portion of the property. The vegetation surrounding Mullet creek consists predominantly of Swamp She-oak *Casuarina glauca* with a weedy outer barrier (**Picture 4**). The weeds bordering the creek are discussed in section **4.1.8. Weeds of Concern.** Mullet creek provides an essential resource for all species, water (**Picture 5**). The abundance of water that Mullet creek provides increases the likely density and diversity of species inhabiting the property. The fruiting She-oaks along the creek act as a feeding resource for Glossy Black Cockatoos *Calyptorhynchus lathami*, however no chewings (oarts) from Glossy Blacks were found during the property inspection (**Picture 6**).

Picture 4: Creek line vegetation

Picture 5: Mullet Creek

Picture 6: Swamp She-oak seeds

The dense weedy understory in addition to timber piles (**Picture 7**) on the property provide habitat for locally common reptiles, frogs and various mammals.

There were a number of tree species flowering during the property inspection, including a number of Eucalyptus species. These flowers provide a feeding resource for local bird species as well as Flying Fox Species.

Picture 7: Timber piles

The property also contains multiple hollow bearing trees which provide shelter habitat for a number of urban arboreal mammal species (**Picture 7**). Scratches on the trees throughout the property suggests occupation of the hollows by arboreal mammals (**Picture 8**).

Picture 7: Hollows in Camphor Laurel

Picture 8: Fauna Scratches on Some Trees

Narrabeen Sports High School contains few ecological values with the majority of vegetation on site confined to scattered trees and garden beds. The vegetated garden beds on site (**Picture 1)** have the potential to act as refuge habitat for locally common reptile, frog and mammal species. There were also a number of tree species flowering during the property inspection, including a number of Eucalypt species. These flowers provide a feeding resource for local bird species (**Picture 2 & 3**). Furthermore, a Camphor Laurel tree was found to contain multiple hollows (**Picture 4)**. This tree has the potential for provide refuge hollows for arboreal mammal and bird species.

4.3 Plant Community Types

The field survey was able to confirm that two native plant community type is present in the Subject Site. Further to this, scattered trees and shrubs associated with the landscaping present in Subject Site are shown in **Figure 7**.

Vegetation within the Subject Site has been assessed as aligning with the BioNet Vegetation Classification PCTs summarised in **Table 2** and their extent is shown in **Figure 7**. Detailed descriptions of each PCT are provided in the following subsections.

Table 2 PCTs identified within the Subject Site

PCT ID	PCT name	Notes	Subject Site area (ha)
4027	Estuarine Swamp Oak-Mangrove Forest	Vegetation along Mullet Creek. This community corresponds with the "*Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*" TEC under the BC Act. This community will not be impacted by the proposed development.	1.56
3638	South Coast Sands Bangalay Forest	Biodiversity Value Area north of Namona Street. Mixed native and planted native vegetation. This community appears consist with the "*Bangalay Sand Forest of the Sydney Basin and South East Corner bioregions* " TEC listed under the BC Act. This community will not be impacted by the proposed development.	1.2
-	Planted vegetation throughout the Subject Ste	Biodiversity Value Area north and south of Namona Street. Many planted exotic and native species present throughout.	3.1
-	Cleared Lands	Carparks, buildings and playgrounds without canopy cover.	3.94
	Total area		9.8

Figure 7 Plant Communities Present on the Subject Site

4.4 Flora Species

A total of 96 flora species were recorded from the Subject Site. Of these, 31 species are considered introduced or weed species. This indicates the high levels of historic and on-going disturbance present on the Subject Site. The species recorded from the Subject Site detailed in **Table 2**.

Table 3 Flora Species Recorded during Field Survey

Family	Scientific Name	Common Name
Aizoaceae	*Tetragonia tetragonoides*	New Zealand Spinach
Amaranthaceae	*Alternanthera denticulata**	Lesser Joyweed
Amaryllidaceae	*Agapanthus* sp.*	Agapanthus
Apiaceae	*Cyclospermum leptophyllum*	Slender Celery
Apiaceae	*Apium prostratum*	Sea Celery
Anacardiaceae	*Mangifera indica*	Mango
Anacardiaceae	*Harpephyllum caffrum*	Kaffir Plum
Araliaceae	*Hydrocotyle bonariensis*	Largeleaf Pennywort
Arecaceae	*Phoenix canariensis**	Canary Island Date Palm
Arecaceae	*Livistonia australis*	Cabbage Tree Palm
Arecaceae	*Archontophenix cunninghamiana*	Bangalow Palm
Arecaceae	*Phoenix canariensis*	Canary Island date palm
Asparagaceae	*Asparagus aethiopicus**	Ground Asparagus
Asparagaceae	*Lomandra longifolia*	Spiny-headed Mat-rush
Asparagaceae	*Yucca* sp.*	Yucca
Asparagaceae	*Asparagus plumosus**	Climbing Asparagus Fern
Aspleniaceae	*Asplenium australasicum*	Bird's Nest Fern
Asteraceae	*Salvia sessilis**	Salvia
Asteraceae	*Hypochaeris glabra*	Smooth Catsear
Asteraceae	*Gamochaeta* sp.*	Cudweed
Asteraceae	*Taraxacum officinale**	Dandelion
Asteraceae	*Hypochaeris radicata**	Catsear
Asteraceae	*Facelis refusa**	Annual Trampweed
Asteraceae	*Conyza* sp.*	Horseweed
Bignoniaceae	*Jacaranda mimosifolia*	Jacaranda
Caryophyllaceae	*Polyycarpa tetraphyllum*	Flour-leaved Allseed
Casuarinaceae	*Casuarina glauca*	Swamp Oak
Casuarinaceae	*Casuarina cunninghamiana* α	River Oak
Commelinaceae	*Commelina cyanea*	Commelina
Cyperaceae	*Carex inversa*	Carex
Cyperaceae	*Cyperus imbecillis*	
Dennstaedtiaceae	*Pteridium esculentum*	Bracken
Dilleniaceae	*Hibbertia scandens*	Climbing Guinea Flower
Elaeocarpaceae	*Elaeocarpus reticulatus*	Blueberry Ash
Ericaceae	*Monotoca elliptica*	Tree Broom-heath
Fabaceae	*Medicago* sp.	Burr-medic

Family	Scientific Name	Common Name
Fabaceae	*Senna pendula* var *glabrata*	Senna
Fabaceae	*Acacia longifolia*	Coastal Wattle
Fabaceae	*Senna pendula glabra*	Senna
Lauraceae	*Cinnamomum camphora**	Camphor Laurel
Lauraceae	*Persea americana*	Avocado
Malvaceae	*Modiola caroliniana**	Red-flowered Mallow
Malvaceae	*Brachychiton accifolius* α	Illawarra Flame Tree
Meliaceae	*Synoum glandulosum*	Scentless Rosewood
Menispermaceae	*Stephania japonica var discolor*	Snake Vine
Moraceae	*Ficus macrocarpa*	Hills Weeping Fig
Myrtaceae	*Eucalyptus robusta*	Swamp Mahogany
Myrtaceae	*Eucalyptus botryoides*	Bangalay
Myrtaceae	*Eucalyptus scoparia* α	Wallangarra Gum
Myrtaceae	*Eucalyptus saligna*	Sydney Blue Gum
Myrtaceae	*Eucalyptus sideroxylon*	Red Ironbark
Myrtaceae	*Eucalyptus botryoides*	Southern Mahogany
Myrtaceae	*Corymbia citriodora* subsp. *variegata*	Lemon-scented Gum
Myrtaceae	*Melaleuca styphelioides*	Prickly Paperbark
Myrtaceae	*Syzygium australe* α	Brush Cherry
Nephrolepidaceae	*Nephrolepis cordifolia*	Fishbone Fern
Ochnaceae	*Ochna serrulata**	Ochna
Oleaceae	*Ligustrum lucidum**	Large-leaved Privet
Oleaceae	*Notelaea longifolia*	Mock Olive
Oleaceae	*Ligustrum sinense**	Small-leaved Privet
Oleaceae	*Osmanthus fragrans*	Fragrant Olive
Oxalidaceae	*Oxalis* sp.	Oxalis
Passifloraceae	*Passiflora herbertiana*	Native Passionfruit
Phyllanthaceae	*Breynia oblongifolia*	Breynia
Phyllanthaceae	*Glochidion ferdinandi ferdinandi*	Cheese Tree
Pittosporaceae	*Pittosporum undulatum*	Sweet Pittosporum
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues
Poaceae	*Cynodon dactylon*	Couch
Poaceae	*Erharta erecta**	Panic Veldtgrass
Poaceae	*Oplismenus* sp.	Australian Basket Grass
Poaceae	*Cenchrus clandestina*	Buffel Grass
Poaceae	*Microleana stipoides*	Weeping Grass
Poaceae	*Sporobolous* sp.	
Poaceae	*Bromus* sp.*	Sand Brome
Poaceae	*Lolium perenne**	Perennial Ryegrass
Poaceae	*Dichondra repens*	Kidney Weed
Poaceae	*Stenotaphrum secundatum**	Buffalo Grass
Poaceae	*Phragmites australis*	Phragmites

Family	Scientific Name	Common Name
Polygonaceae	*Rumex brownii*	Swamp Dock
Polygonaceae	*Rumex sagittata**	Rambling Dock
Primulaceae	*Lysimachia arvensis**	Scarlet Pimpernel
Primulaceae	*Samolus repens*	Creeping Brookweed
Proteaceae	*Banksia ericifolia*	Heath-leaved Banksia
Proteaceae	*Banksia integrifolia*	Coastal Banksia
Proteaceae	*Banksia serrata*	Saw Leaf Banksia
Rubiaceae	*Galium* sp.*	Bedstraw
Salicaceae	*Populus deltoides*	Cotton Wood
Sapindaceae	*Cardiospermum halicacabum**	Balloon Vine
Sapindaceae	*Cupaniopsis anacardioides*	Tuckeroo
Smilacaceae	*Smilax glyciphylla*	Sweet Sarsaparilla
Solanaceae	*Solanum ptychanthum**	Nightshade
Solanaceae	*Cestrum parqui**	Green Cestrum
Solanaceae	*Solanum nigrum**	Black-berry Nightshade
Strelitziaceae	*Strelitzia* sp.*	Bird of Paradise
Verbenaceae	*Lantana camara**	Lantana
Violaceae	*Viola hederacea*	Ivy-leaved Violet

* - Introduced Weed Species, $^{\alpha}$ – Planted Species

4.5 Fauna Species

As shown in **Table 4** below, 13 fauna species were observed consisting of common avian species and mammalian species. No threatened avian, mammal, reptile or amphibian species were observed during the field inspection.

Table 4 Fauna Species Recorded During Field Survey

Scientific Name	Common Name	NSW Status	EPBC Status
Birds			
Manorina melanocephala	Noisy Miner	P	-
Corvus coronoides	Australian Raven	P	-
Rhipidura leucophrys	Willie Wagtail	P	-
Trichoglossus moluccanus	Rainbow Lorikeet	P	-
Vanellus miles	Masked Lapwing	P	-
Threskiornis molucca	Australian White Ibis	P	-
Oriolus sagittatus	Olive-backed Oriole	P	-
Sericornis frontalis	White-browed Scrubwren	P	-
Eurystomus orientalis	Dollarbird	P	-
Platycercus eximius	Eastern Rosella	P	-
Anas platyrhynchos	Domestic Duck (Swedish Blue Duck)	-	-
Mammals			
Trichosurus vulpecula	Common Brushtail Possum	P	-
Oryctolagus cuniculus	European Rabbit	-	-

P – Protected under the NSW *Biodiversity Conservation Act*

4.6 Weeds of Concern

Several high threat weed species were recorded during the surveys of the Subject Site. These species are detailed in **Table 5** below.

Table 5 Weeds of Significance

Scientific Name	Common Name
Acetosa sagittata	Green Cestrum, Green Poison Berry
Erharta erecta	Lantana
Ochna serrulata	Ochna, Bird's Eye Bush
Rumex sagittatus	Rambling Dock, Turkey Rhubarb
Cardiospermum halicacabum	Balloon Vine
Asparagus aethiopicus	Ground Asparagus
Asparagus plumosus	Climbing Asparagus
Ligustrum sinense	Broad-leaved Privett
Cenchrus clandestina	Buffel Grass

4.7 Conservation Significant Species

4.7.1 Flora

One threatened flora, *Eucalyptus scoparia* (Wallangarra Gum) was recorded on the Subject Site during the field surveys. This species naturally occurs in far northern New South Wales and in Southern Queensland. This species has been extensively planted for urban gardens. This species is an exempt species in the Northern Beaches Local Government Area and can be cleared with approval provided it is not a heritage item or occurs within a heritage area. No other threatened flora species have been recorded on or adjacent to the Subject Site. No other conservation significant flora species were identified on the Subject Site during the field survey.

4.7.2 Fauna

No conservation significant fauna were identified during the field inspection of the site. Review of available habitat present on the site consisting of a hollow bearing tree and a number of flowering tree and shrub species were assessed against the habitat requirements of threatened fauna species previously recorded within 1.5 km of the Subject Site.

This assessment of likely occurrence (**Appendix B**) found that Southern Myotis, Eastern Freetail Bat, Eastern Long-eared Bat, Grey-headed Flying Fox, Fork-tailed Swift, and Powerful Owl may have some potential to occur on the Subject Site. These species are assessed for potential impacts in **Section 5** of this report. Due to historic disturbance, and the ongoing use of this school site, no other threatened fauna species are considered likely to occur.

5 Potential Impacts

5.1 Vegetation Clearing

No Plant Community Types (PCTs) will be impacted by the proposed development. The vegetation along Mullet Creek and the patches of mapped Wetland will be avoided by the proposed development. For the purposes of this development application the arborist's reports prepared by Independent Arborists (2022) identified 3 trees on the NNPS site that will require removal and 3 trees on the NSHS site that are expected to be removed for the proposed Binishell redevelopment on the NNPS site and construction of the gymnasium on the NSHS site. These trees are identified in **Table 6** below and comments made with respect to the ecological value. The Independent Arborists Reports (2022) contain a full list of the tree species identified.

Table 6 Plants to be Removed to accommodate the proposed development

Tree Number	Scientific Name	Common Name	Comment
Narrabeen North Primary School			
55	*Eucalyptus botryoides*	Bangalay	This tree may provide a foraging resource for various fauna species. No evidence of fauna use was observed. No koala scats were detected underneath this tree species.
57	*Populus deltoides*	Cotton Wood	This tree may provide a foraging resource for various fauna species. No evidence of fauna use was observed. No koala scats were detected underneath this tree species.
58	*Eucalyptus botryoides*	Bangalay	This tree may provide a foraging resource for various fauna species. No evidence of fauna use was observed. No koala scats were detected underneath this tree species.
Narrabeen Sports High School			
65	*Eucalyptus robusta*	Swamp Mahogany	This tree may provide a foraging resource for various fauna species. No evidence of fauna use was observed. No hollows were identified within this tree.
66	*Eucalyptus robusta*	Swamp Mahogany	This tree may provide a foraging resource for various fauna species. No evidence of fauna use was observed. No hollows were identified within this tree.
67	*Lophostemon confertus*	Brushbox	This tree may provide a foraging resource for various fauna species. No evidence of fauna use was observed. No hollows were identified within this tree.

5.2 Threatened Flora

Two specimens of *Eucalyptus scoparia* (Wallangarra Gum) will be cleared as a consequence of the proposed development. This species is listed as Endangered under BC Act. This species natural range is from far northern NSW and southern Queensland. This species has been extensively planted as an urban landscaping tree. Under the Pittwater LEP/Pittwater 21 DCP, this species is identified as and "Exempt Tree" and can be cleared unless it's identified as a Heritage Item or occurs within a Heritage Area.

No other threatened flora was identified as known to occur or as having potential to occur on the Subject Site. This is primary due to the historic disturbance undertaken across this Subject Site and the ongoing disturbance associated with school maintenance activities and its use as a school ground.

Therefore, there are not expected to be any impacts on threatened flora species as a consequence of the proposed development.

5.3 Terrestrial Threatened Fauna

The likelihood of occurrence assessment contained in **Appendix B** identified that there is potential for the following six threatened fauna species to occur within the Subject Site:

- Southern Myotis (*Myotis macropus*)
- Fork-tailed Swift (*Apus pacificus*)
- Eastern Freetail Bat (*Micronomus norfolkensis*)
- Eastern Long-eared Bat (*Nyctophilus bifax*)
- Grey-headed Flying Fox (*Pteropus poliocephalis*); and
- Powerful Owl (*Ninox strenua*).

Assessment of the significance of potential impacts upon these species is discussed further in **Section 6** of this report.

5.4 Koala Habitat Assessment

The Northern Beaches Local Government Area does not have a Koala Plan of Management.

5.4.1 Protection of Core Koala Habitat

The aim of this assessment was to determine if Core Koala habitat is present on the Subject Site. Under the SEPP, Core Koala Habitat is defined as:

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

5.4.2 Koala Habitat Assessment

The subject site has been historically cleared of vegetation other than a small patch identified as Bangalay Forest. The Subject Site has been fenced in accordance with Department of Education requirements with a tall man-proof fence for the protection of staff and students.

Review of the Bionet database (2022), identified that Koala has not been recorded with on or within 1.5km of the Subject Site. This highly visible species, and the lack of recorded sightings in this area indicates Koala have not been present for in excess of 20 years.

The tree survey undertaken as a component of this assessment has identified various koala feed tree species as being present including *Eucalyptus botryoides* (Bangalay), *Eucalyptus robusta* (Swamp Mahogany), *Casuarina glauca* (Swamp Oak), *Eucalyptus saligna* (Sydney Blue Gum), *Eucalyptus siderophloia* (Grey Ironbark and *Melaleuca quinquenervia* (Broad-leaved Paperbark). Targeted survey of each of the trees present throughout the Subject Site, did not identify any koala or evidence of their occurrence such as Koala scats or indicative scratch marks on trees. The trees proposed for removal are therefore not considered important for the protection of koala.

5.4.3 Biodiversity and Conservation SEPP Conclusion

Due to historic disturbance of the Subject Site, together with on-going disturbance associated with the school fencing and management practices, as well as urbanisation of the locality, the Subject Site does not constitute Core Koala Habitat.

6 Assessments of Significance

6.1 Biodiversity Conservation Act

6.1.1 Terrestrial Fauna

This assessment of significance has been undertaken for the following threatened species that have been determined to have the potential to occur on the Site:

- Southern Myotis (*Myotis macropus*)
- Fork-tailed Swift (*Apus pacificus*)
- Eastern Freetail Bat (*Micronomus norfolkensis*)
- Eastern Long-eared Bat (*Nyctophilus bifax*);
- Grey-headed Flying Fox (*Pteropus poliocephalis*); and
- Powerful Owl (*Ninox strenua*).

(a) In the case of a threatened species, whether the action proposed 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,

It is understood that 3 trees from the NNPS site will require removal and a further 3 trees from the NSHS site will be impacted on as result of the proposed upgrade works. This vegetation exists as fragmented trees adjacent to existing school facilities that experience high levels of edge-effects and disturbance. Although the above threatened species may utilise the site periodically, the impacts on vegetation as a result of the proposed works will not place any of these species at risk of extinction. The habitats provided by the Subject Site are minimal when compared to those present throughout the Study Area.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No endangered populations were identified as using the Subject Site during the preparation of this assessment. No threatened populations of any threatened species will be impacted by the proposed clearing of 3 trees from the NNPS site or the 3 trees from the NSHS site to enable the school development.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

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
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.

No endangered ecological communities will be impacted on the Subject Site. Areas of TEC present along Mullet Creek and the Bangalay open forest (wetland areas) adjacent to Namona Street will be avoided during all construction activities. Not applicable.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

With respect to Southern Myotis, Eastern Freetail Bat and Eastern Long-eared Bat, and Grey-headed Flying Fox the proposed development will result in the removal 3 trees from the NNPS as well as 3 trees from the NSHS site. The removal of these trees is not expected to have a significant impact on these species. Extensive foraging areas occur to the north of the Subject Site within Warriewood Reserve and along Mullet Creek to the west of the Subject Site. The sub-optimal habitat on the Subject Site is considered unlikely to represent important habitat for these species. Further to this, the proposed replacement of trees to be cleared will ultimately eliminate any minor residual impacts on these species over time.

Fork-tailed Swift (*Apus pacificus*) is a predominantly aerial species. It is considered unlikely that the proposed school upgrade will result in impacts to the habitat of this species.

No native hollow bearing trees will be impacted by the proposed school upgrade, therefore breeding habitat of Southern Myotis, and Powerful Owl will not be impacted. The loss of 3 trees from the NNPS site and the 3 trees from the NSHS site, some of which may provide foraging or roosting habitat for these species will occur. However, given the large number of similar tree species both throughout the Subject Site and within the locality, no significant impact on foraging or roosting habitat of these species is expected to occur.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for these species has currently been identified by the Director-General of the OEH.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

An approved recovery plan for the Powerful Owl and the Grey-headed Flying Fox exists and the relevant objectives of each plan are outlined below.

Powerful Owl

A recovery plan has been prepared for large forest owls, including the Powerful Owl. The ultimate aim of the recovery plan is to ensure that the species it covers persist in the wild in NSW in each region where they presently occur (DEC (NSW), 2006).

The proposed development is not considered likely to threaten the objectives of this plan, as only a small area of potential roosting habitat that is not important to the long-term survival of these species will be impacted.

No threat abatement plans have been prepared for any of these species.

Grey-headed Flying Fox

The purpose of this plan is to set out the management and research actions necessary to stop the decline of, and support the recovery of the Grey-headed Flying-fox over the next ten years.

The overall objectives of the Grey-headed Flying-fox recovery plan are:

- to improve the Grey-headed Flying-foxes national population trend by reducing the impact of the threats outlined in this plan on Grey-headed Flying-foxes through habitat identification, protection, restoration and monitoring, and
- to assist communities and Grey-headed Flying-foxes to coexist through better education, stakeholder engagement, research, policy and continued support to fruit growers.

No camp sites occur within or adjacent to the Subject Site. The proposed development is not considered likely to threaten the objectives of this plan, as only a small area of potential roosting/foraging habitat that is not important to the long-term survival of these species will be impacted.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposal's actions would constitute the key threatening process of "Clearing of native vegetation". Although the proposed development will contribute to this key threatening processes, it is not seen to exacerbate it to the extent that it will impact on the survival of any threatened species or population within the locality.

6.2 Pittwater 21 Development Control Provisions

The Pittwater 21 DCP contains provisions relating to native vegetation. Section B4.2 Flora and Fauna Conservation Category 1 and Wildlife Corridor and Section B4.8 Freshwater Wetland Endangered Ecological Communities list the controls outlined in **Table 7** and **Table 8** and the proposed outcomes from this development respectively.

Table 7 Section B4.2 Flora and Fauna Conservation Category 1 Requirements

DCP Requirement	Comment
Development shall retain and enhance habitat for threatened species, endangered populations, endangered ecological communities, and other locally native species.	No threatened species have been recorded on the site. The locations of proposed new building have been selected to minimise impacts on native vegetation. Replacement tree planting will be undertaken as a component of the proposed development so there is no net loss of trees. Replacement plantings are detailed within the Landscape Plan for the site.
Development shall provide wildlife corridors via creation, restoration, and / or regeneration of habitat.	The vegetation along Mullet Creek has been avoided. This vegetation represents the only functional corridor which runs along the western boundary of the Subject Site.

DCP Requirement	Comment
Development shall result in no significant onsite loss of canopy cover and no net loss in native canopy trees.	Replacement tree planting will be undertaken as a component of the proposed development so there is no net loss of trees. Replacement plantings are detailed within the Landscape Plan for the site.
Caretakers of domestic animals shall prevent them from entering wildlife habitat areas.	Domestic pets are not permitted on the school grounds.
Fencing, where permitted, shall be passable by native wildlife.	The school site is currently fenced with man proof fencing so as to ensure the safety of students. No additional fencing is proposed as a result of this development.

Table 8 Section B4.6 Wildlife Corridors Requirements

Requirements	Proposed Outcome
Development shall not directly impact on / or significantly reduce / degrade habitat for locally native species, threatened species, endangered populations or endangered ecological communities	The proposed development will result in the removal of 3 trees from public school site and a further 3 trees from the high school site. The loss of this vegetation is not expected to significantly impact any threatened species. Replacement planting is proposed to offset the loss of the trees to be removed.
Development shall retain, and provide an adequate buffer to, wildlife corridors	Disturbance to the Mullet Creek vegetated corridor has been avoided by this proposed development.
Development shall provide wildlife corridors via creation, restoration, and / or regeneration of habitat	Replacement tree planting will be undertaken as a component of the proposed development so there is no net loss of trees. Replacement plantings are detailed within the Landscape Plan for the site.
Development shall ensure that at least 60% of any new planting incorporates native vegetation (as per species listed in Native Plants for Your Garden available on the Pittwater Council website). Landscaping is to be outside areas of existing bushland and not include environmental weeds.	A landscaping plan has been developed in compliance with this measure.

Requirements	Proposed Outcome
Planting is to maximise linkage within the wildlife corridor	A landscaping plan has been developed in compliance with this measure.
Caretakers of domestic animals shall prevent them from entering areas of wildlife habitat.	Domestic pets are not permitted on the school grounds.
Fencing, where permitted, shall be passable by native wildlife.	The school site is currently fenced with man proof fencing so as to ensure the safety of students. No additional fencing is proposed as a result of this development.

Table 9 Section B4.8 Freshwater Wetland Endangered Ecological Communities Requirements

Requirements	Proposed Outcome
Development shall not have an adverse impact on Sydney Freshwater Wetlands Endangered Ecological Community on Coastal Floodplains.	The area of wetland present on the Subject Site has been historically impacted by School development and management. The proposed development avoids this area and therefore will not further impact any existing wetland values this area may have.
Development shall restore and/or regeneration Sydney Freshwater Wetlands Endangered Ecological Community on Coastal Floodplains and provide links between remnants.	The wetland area present on the Subject Site will be avoided by all construction activities. A landscape management plan has been developed and includes tree planting to augment the existing tree plantings on the Subject Site. It is proposed to utilize suitable native species. This action will assist in some regeneration of the wetland values by providing important linkages to this area.
Development shall be in accordance with any Recovery Plan or priority action statement Recovery Plan.	No Recovery Plan has as yet been developed for this TEC. The wetland area present on the Subject Site will be avoided by all construction activities.
Compliance with Council's Water Management for Development Policy is required.	Sedimentation and erosion control measures will be implemented throughout construction activities. These measures will aim to eliminate potential impacts on quality of water discharged to the natural areas on the Subject Site. This measure will protect the ecological and recreational condition of beaches, waterways, riparian areas and bushland adjacent to the proposed construction areas.

Requirements	Proposed Outcome
	Sedimentation erosion control measures will be implemented throughout construction activities. These will be implemented to minimise the risk to public health and safety. The proposed development has considered the risks to life and property from any flooding and groundwater damage. The school has been designed to address flooding issues to ensure the safety of students and staff and to eliminate heightened risk of flooding on neighbors. The proposed school upgrade has included measures where practicable for water sensitive urban design. The proposed development avoids impacts to Mullet Creek. The proposed landscape plan for the site will result in the planting of native tree species which will benefit the ecological values of Mullet Creek. Sedimentation and erosion control measures will be employed throughout construction to protect Council stormwater drainage assets during works. These measures will ensure Council's drainage rights are not compromised by development activities.
Development shall not result in a significant onsite loss of canopy cover or a net loss in native canopy trees.	The wetland area present on the Subject Site will be avoided by the proposed development. There will not be any loss of wetland canopy cover as a result of this development.
Development shall ensure that at least 80% of any new planting incorporates native vegetation (as per species found on the site or those listed in wetland endangered ecological communities)	The proposed landscape plan developed for the Subject Site includes 100% native vegetation all of which will be endemic to the Subject Site.
Development shall ensure any landscaping works are outside areas of existing Sydney Freshwater Wetlands Endangered Ecological Community and do not include Environmental Weeds.	All works will be outside of the wetland area present on the Subject Site. To ensure compliance, all construction personnel will be inducted to the site, with the importance of avoidance of disturbance to this area highlighted. Signage will also be erected to ensure that wetland areas are avoided.

Requirements	Proposed Outcome
Fencing, where permitted, shall be passable by native wildlife.	The school site is currently fenced with man proof fencing to ensure the safety of students and staff. No additional fencing is proposed as a result of this development.

7 Conclusions and Recommendations

7.1 Direct Impacts

7.1.1 Threatened Ecological Communities

Two threatened ecological communities (TEC's) were identified as occurring on the Subject Site. The vegetation present along the banks of Mullet Creek corresponds to "Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions" TEC. Further to this, the vegetation community Bangalay Open Forest may also correspond to the "Bangalay Sand Forest of the Sydney Basin and South East Corner bioregion TEC. As no clearing will be undertaken within these TEC's, the proposed school upgrade is not expected to impact on these communities. As a consequence, regulations under the BC Act do not require the preparation of a Biodiversity Assessment Report (BDAR).

7.1.2 Wetland Areas

The development site contains mapped Plant Community Type (PCT) 4027 Swamp Oak Swamp Forest Fringing Estuaries, Sydney Basin and South East Corner Bioregion along the riparian buffer of Mullet Creek as well as two patches of vegetation adjacent to Namona Street. This community is classified as a wetland in accordance with the Coastal Resilience and Hazards SEPP and falls under the vegetation formation of a forested wetland. This vegetation community is not located within the proposed development footprint. To ensure no impacts result on this community, it will be important to outline its presence, the implications of any associated construction activities occurring within the boundaries of this area on all construction personnel. This information should be outlined to all personnel prior to works commencing or personnel commencing work on the site.

7.1.3 Threatened Flora

Two specimens of *Eucalyptus scoparia* (Wallangarra Gum) will be cleared as a consequence of the proposed development. This species is listed as Endangered under BC Act. This species natural range is from far northern NSW and southern Queensland. This species has been extensively planted as an urban landscaping tree. Under the Pittwater LEP, this species is identified as and "Exempt Tree" and can be cleared unless it's identified as a Heritage Item or occurs within a Heritage Area.

No other threatened flora species have previously been recorded on the Subject Site. Due to the historic disturbance to the Subject Site, and the ongoing use and maintenance of the site as a school ground, no threatened flora species are expected to occur. As a consequence, regulations under the BC Act do not require the preparation of a BDAR.

7.1.4 Threatened Fauna

The proposed works will impact 3 trees on the NNPS site and 3 trees on the NSHS site, which may provide highly limited potential foraging habitat for the above listed threatened species. This habitat is unlikely to be important to the survival of any of these species as the trees occur in patches, experiencing high levels of disturbance and edge effects. Additionally, within the locality, larger and more suitable patches of vegetation for these species occur within a number of reserves including Warriewood Reserve. Furthermore, all of these

species are highly mobile and the proposed works will not decrease the movement of individuals and gene flow between areas of potential habitat throughout the locality or within or between their local populations. For these reasons, the proposed development is considered unlikely to have a significant impact on any of these threatened species. As a consequence, regulations under the BC Act do not require the preparation of a BDAR.

7.2 Indirect Impacts

7.2.1 Erosion and Sedimentation Control

It is recommended that a site-specific sedimentation and erosion control plan be developed for the Subject Site. This will ensure that no downstream impacts will occur on any conservation significant species.

7.2.2 Weed Management

Given construction access will be over dedicated hardstand and aggregate, it is considered that there will be a low risk for the ingress or egress of weeds. As a consequence, no specific weed management recommendations are required.

8 References

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DoE (2015). "EPBC Protected Matters Search Tool." Retrieved July 2022, from http://www.environment.gov.au/arcgis-framework/apps/pmst/pmst-coordinate.jsf.

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Appendix A – Richard Floyd Curriculum Vitae

Richard Floyd

Principal Ecologist

I am the Principal Ecologist located in the Brisbane office of ADE Consulting. I have in excess of 24 years' experience undertaking and managing ecology studies throughout coastal and remote areas of Australia. I commenced my career in the preparing ecological assessments in the Sydney basin area of NSW. During this time, I was required to identify the flora species of this area and undertake vegetation mapping in support of development applications proposed in this area.

I gained further experience with approximately10 years working in local government as an Environmental Officer at Maclean Shire Council and then Greater Taree City Council. During this time I was one of the main authors of the "Vegetation of the Greater Taree City Council Local Government Area" which was developed for implementation of a local government area wide Vegetation Management Plan to guide future development in this area. I then co-authored the related "Greater Taree City Council Comprehensive Koala Management Plan" which drew on the vegetation mapping previously prepared but with additional targeted koala surveys to identify important koala habitat in the council area. These important Council initiatives highlight the experience I gained in the identification of conservation significant vegetation, and the importance that vegetation plays with conservation significant fauna species within the context of regulatory planning requirements. I also spent time during my career in local government undertaking regulatory compliance assessments for various forms of land development where I was required to prepare comprehensive Reviews of Environmental Effects in support of local government activities. Again this relied upon me identifying conservation significant flora species and communities as well as all other aspects involved in ecological assessment to satisfy the *Environmental Planning and Assessment Act (1979)* as well as the Commonwealth *Environment Protection and Biodiversity Conservation Act (1999)*.

In addition to the experience I gained in Victoria, I also led the Flora Assessment Team for a large ecological consultancy in Perth, Western Australia. This experience focused on the provision of detailed vegetation mapping and flora field surveys to identify conservation significant flora species and vegetation communities throughout Western Australia and the Northern Territory. I gained extensive experience specifically with the Wheatstone project based in the Pilbara, where I was responsible for field survey teams, and ultimately in the production of significant components of the EIS in support of this project.

My most recent major project experience was with various Coal Seam Gas projects in central Queensland including the QGC project as well as the APLNG project. I was ultimately the author of the Threatened Flora Species Management Plans, the Threatened Fauna Species Management Plans and the Threatened Ecological Communities Management Plans prepared for both the gas field operations and the transmission pipelines of the APLNG project. This work required a detailed understanding of the flora, vegetation and fauna values of a significant area of Queensland, combined with the statutory requirements that the APLNG project was required to meet during approval, construction, operational and decommissioning phases of this major project.

As demonstrated above, I have gained extensive experience in flora and fauna assessments, impact assessment, monitoring and rehabilitation works as well as offsetting environmental impacts. I have also gained experience in the preparation of Statements of Evidence for the NSW Land and Environment Court and I have appeared as an expert witness during court proceedings.

Qualifications: Bachelor of Science, Graduate Diploma of Natural Resource Management

Yrs in Industry: 24

Expertise:

- Ecological impact assessment
- Vegetation community classification and mapping (Aerial Photo Interpretation (historic and current))
- Threatened species conservation assessment and management plans
- Review of biodiversity policy, legislation, regulation and guidelines

Accreditations & Licences:

- NSW Class C manual drivers licence
- Flora Survey Permit for Western Australia
- Defence Baseline Security Clearance

Previous Experience:

- February 2020 to present - Prinicpal Ecologist ADE Consulting
- January 2017 to January 2020 – Principal Ecologist, Umwelt (Australia) Pty Limited –undertaking ecological assessments throughout Australia for diverse multi-disciplinary environmental projects
- June 2015 to January 2017 – Queensland Manager, Cumberland Ecology Pty Limited – managing and leading the QLD team of ecologists for diverse multi-disciplinary environmental consultancy as well as occasional preparation/review of Statements of Evidence for various proceedings in NSW
- July 2010 to June 2015 – Principal Ecologist/Field Survey Co-ordinator – AMEC Foster Wheeler – undertaking the vegetation survey and conservation assessment of coal seam gas projects throughout the Surat Basin of Queensland as well as various other projects throughout NSW, WA and Victoria
- July 2007 to July 2010 – Flora and Fauna Team Lead – Outback Ecology Perth, Western Australia – undertaking flora and fauna surveys throughout Western Australia for impact assessment reports.
- July 2005 to July 2007 – Principal Ecologist – AECOM Brisbane and Melbourne - undertaking flora and fauna impact assessments throughout Queensland and Victoria.
- June 2003 to July 2005 – Senior Ecologist at ERM – undertaking flora and fauna impact assessments throughout Queensland.
- March 1999 to June 2003 – Senior Environmental Officer Greater Taree City Council Review of flora and fauna assessments prepared for development applications for areas throughout the local government area. Preparation of Reviews of Environmental Effects for Council projects. Preparation of the vegetation mapping for the Local Government Area for the development of a shire wide Vegetation Management Plan. Preparation of the Greater Taree City Council Comprehensive Koala Management Plan.
- February 1996 to March 1999 – Environmental Officer Maclean Shire Council – Review of flora and fauna assessments prepared for development applications for areas throughout the local government area. Site investigations for illegal clearing/development, site contamination, and illegal waste dumping in contravention of Council regulations. Preparation of Reviews of Environmental Effects for Council projects, preparation of Council reports on environmental issues and associated correspondence to government authorities
- February 1994 to February 1996 – Ecologist at Integrated Site Planning and Assessment – Preparation of flora and fauna assessments primarily throughout the Sydney basin area and Gosford areas but also in various other areas of NSW.

Contact

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0437 378 420

Relevant Project Experience

Residual Void Project , Central Queensland Coal Mine (Confidential Project) 2018 Ecology Lead.
I was responsible for assessing the aquatic and terrestrial ecological assessment for 3 proposed options associated with the end use of residual voids associated with a Queensland mine site. Key issues in this assessment included vegetation, threatened flora, surface and ground water quality to identify and assess potential impacts on the environment.

Jerrys Plains, NSW Environmental Offsets Project | United Collieries | 2017 | Botanist. I undertook 3 weeks of intensive field survey of the proposed offset areas, determining distribution of vegetation communities across the project properties, and their associated condition. This survey was to address conditions of consent contained within Commonwealth and State regulatory approvals.

Mt Owen, NSW Environmental Offsets Project | Glencore Mines | 2017 | Botanist. I undertook the 3 weeks of field survey of the proposed offset areas, determining distribution of vegetation communities across the project properties, and their associated condition. This survey was to address conditions of consent contained within Commonwealth and State regulatory approvals.

Offset Area Assessment – Meteor Downs South | U&D Mining Pty Ltd | 2016 | Lead Ecologist. I led the flora and fauna surveys for this project. Richard was required to assess potential offset sites located on the existing mining lease. This involved detailed mapping of vegetation communities using aerial photo interpretation and targeted field surveys of the vegetation present on the lease areas, assessment of potential habitat values to threatened flora and fauna species and the subsequent value of the Offset areas.

Wind Farm Project – 2019 | Confidential Client) |Principal Ecologist. I undertook the flora the flora assessment for a 50 wind turbine wind farm near Gladstone, Queensland. This involved literature review of flora databases and report, aerial photo interpretation of vegetation communities present within the Project Area, and ground truthing of identified communities. Targeted surveys were also undertaken for threatened flora species within the Project Area.

Beechina Upgrade, Western Australia – 2018. Flora and Fauna mpact Assessment, Ecologist.
I was responsible for the flora assessment of three upgrade areas in the Beechina area. In addition to targeted threatened and priority flora survey and vegetation mapping, I also undertook a Black Cockatoo survey, looking for actual and potential habitat for threatened Black Cockatoo species.

Maules Creek Mine, NSW – 2017 Expansion Areas Preclearance Surveys and Fauna Spotter/Catcher Services | Whitehaven Coal | 2017 | Team Leader. I led the 6 week field survey of the proposed 2017 expansion areas, identifying the conservation significant flora and fauna species, and their translocation/relocation requirements. I also led the spotter/catcher teams responsible for the capture/rescue and relocation of fauna to the identified relocation area. This survey was to address conditions of consent contained within Commonwealth and State regulatory approvals.

Maules Creek Mine, NSW – 2017 Expansion Areas Radio-tracking of Impacted Species| Whitehaven Coal | 2017 | Project Manager. I led and participated in the field surveys of targeted species to determine their distributions following clearing activities. *Chalinolobus gouldii* (Gould's Wattled Bat) and *Saccolaimus flaviventris* (Yellow-bellied Sheath-tail Bat) were radio-tracked during clearing activities. This survey was designed to determine the distribution of captured bats once released and their subsequent survivability's.

Bauxite Hills Project, Weipa | MetroMines Limited 2015 | Lead Ecologist. I led the wet season flora and fauna assessments of the proposed mine site. Prior to survey, aerial photo interpretation was used to map vegetation. Field surveys were then conducted to verify the vegetation mapping, followed by targeted flora surveys in suitable habitats. Elliott trapping, harp trapping pitfall trapping, Anabat detection and general field observation of fauna habitat was undertaken to determine the actual and likely occurrence of conservation significant species.

Five Proposed Wind farms Sites - Desktop Flora and Fauna Assessments to Minimise Impacts and Prioritise Development | Lacour Energy | 2016 | Lead Ecologist. I was responsible for the assessment of terrestrial and aquatic threatened flora, fauna and ecological communities for 5 potential Wind farm sites throughout Queensland. This involved review of Commonwealth and state databases and mapping for threatened species or communities likely to occur in proximity of each proposed Wind farm site. Analysis was undertaken to assist in the development of a preliminary layout for each Wind farm so as to minimise regulatory controls and to eliminate or minimise impacts upon the habitats of threatened species and communities.

Flora and Fauna Assessment - Santa Isabel Nickel Project | Axiom Mining Pty Ltd | 2016 | Lead Ecologist. I led the flora and fauna surveys for this project. The development involves the mining of ridgeline nickel laterites on a mining tenement located on the island of Santa Isabel in the Solomon Island chain. Survey involved a vegetation map (using available aerial photo interpretation) of the tenement to determine habitat availability, as well as targeted aquatic and terrestrial fauna surveys on significant species known to occur in this area. Field surveys were done to satisfy World Bank standards and were done in accordance with industry best practice.

Terrestrial Threatened Flora and Fauna Monitoring and Rehabilitation Area Monitoring For Callide Mine Site | Batchfire Resources Pty Ltd | 2016| Team Leader. I was responsible for the production of the annual monitoring report for the threatened flora and fauna species and the rehabilitation for the Callide Mine site. This project involved floristic assessment of the mine site and associated offset areas, targeted threatened fauna survey in accordance with Commonwealth and State survey guidelines. An important aspect of this project was the development of completion criteria for the rehabilitation areas in accordance with current best practice and existing mine approvals.

Development of a Conservation Agreement for Australian Lungfish | SEQwater | 2017 | Principal Ecologist. I was responsible for detailing the requirements to achieve a Conservation Agreements between the Department of Environment and Energy and SEQwater with respect to the Australian Lungfish and the operation of 3 gated structures in south east Queensland. This involved providing strategic advice on the process for obtaining the agreements.

APLNG Gas Fields – Species Management Plans | Australia Pacific LNG | 2012 | Lead Author. I was responsible for developing the species management plans in accordance with the *Environment Protection and Biodiversity Conservation Act 1999* approval for this project. Project specific management plans were developed for 32 flora species and 26 threatened fauna species. Management Plans were formulated to ensure the long term protection of these species within the Surat gas fields.

Biannual Flora and Fauna Monitoring | Mt Isa Mine (Glencore) I 2015 | Team Leader. I led the fauna surveys throughout the Mt Isa Mining lease. Survey involved, targeted herpeto-fauna surveys, Elliot trapping for small and medium mammals, harp trapping, spotlighting and Anabat detection. Surveys were done to satisfy Commonwealth and State survey guidelines in accordance with industry best practice.

Wheatstone Project Phase 3 Team Lead for Pre-Clearance Survey Wheatstone Gas Hub | Chevron Australia Pty Ltd | 2010 | **Team Leader.** I led the team to undertake the pre-clearing surveys for conservation significant flora throughout the Phase 3 component of the Wheatstone project. Specifically I was responsible for four field botanists. I also developed a Mangrove Translocation Project for the mangroves identified in the Threatened Ecological Community "Tropical arid zone mangroves along the Pilbara coastline" and led the field teams during the translocation process.

Fraser Range South – Flora and Fauna Assessment and Conservation Management Plan Western Australia | RAM Resources | 2015 | Lead Ecologist. I was responsible for the field surveys and reporting associated with this project. The proposed mine site occurs within a Conservation Reserve, therefore all vegetation and fauna habitat assessments for the project had to be approved by the WA Department of Parks and Wildlife as well as the Environment Protection Authority.

Arcadia Valley Gas Field Preclearance Reporting | Santos Australia Pty Ltd | 2014 | Lead Ecologist. I was required to survey proposed well pads and flow lines for the potential presence of threatened flora, fauna species and endangered ecological communities. This assessment process involved aerial photo interpretation of vegetation communities on the Project Area followed by field validation of identified potential constraints. This process allowed finalisation of the design of the gas field on the Arcadia property.

Lake Maitland Uranium Project, Western Australia | Mega Uranium Pty Ltd | 2009 | Lead Ecologist. I was responsible for the flora and fauna assessment of the project in accordance with the WA Wildlife Conservation Act and the Commonwealth EPBC Act. This involved vegetation mapping of the lease, habitat assessment and assessment of potential impacts upon threatened species known or predicted to occur within the project area.

Expert Witness - Statement of Evidence (1997) NSW Land and Environment Court Proceeding Jacky-bulbin Quarry. Richard prepared a statement of evidence concerning concerning Ecology issues relevant to the proceedings (Proceedings) filed against Maclean Shire Council (the Respondent) by the quarry operator and the Jacky-bulbin Landowners Association.

Publications

McDonald, P., and Floyd, R. (2005). Vegetation of the Greater Taree City Council Area, Greater Taree City Council, NSW.

Callaghan, J., Curran, T., Thompson, J., and Floyd, R. (2002). Draft Comprehensive Koala Plan of Management for Greater Taree City Council. Australian Koala Foundation and Greater Taree City Council, NSW.

Appendix B– Likelihood of Occurrence Table

Scientific Name	Common Name	Status		Occurrences			Preferred Habitat	Likelihood of species or species habitat occurring
		BCA	EPBC	PMST	BioNet 10km	Bionet 1.5km		
PLANTS								
Tetrathreca glandulosa	Black-eyed Susan	V	-		✓		Associated with shale-sandstone transition habitat where shale-cappings occur over sandstone, with associated soil landscapes such as Lucas Heights, Gymea, Lambert and Faulconbridge. Topographically, the plant occupies ridgetops, upper-slopes and to a lesser extent mid-slope sandstone benches. Soils are generally shallow, consisting of a yellow, clayey/sandy loam. Stony lateritic fragments are also common in the soil profile on many of these ridgetops.	Species not observed during field surveys of the site. Species habitat not present on the site. Due to historic clearing and ongoing school management, considered **Unlikely to Occur**.
Epacris purpurascens var. *purpurascens*		V	-		✓		Found in a range of habitat types, most of which have a strong shale soil influence. Lifespan is recorded to be 5-20 years, requiring 2-4 years before seed is produced in the wild. Killed by fire and re-establishes from soil-stored seed.	Species not observed during field surveys of the site. Due to historic clearing and ongoing school management, considered **Unlikely to Occur**.
Chamaesyce psammogeton	Sand Spurge	E	-		✓		Grows on fore-dunes, pebbly strandlines and exposed headlands, often with Spinifex (*Spinifex sericeus*) and Prickly Couch (*Zoysia macrantha*). Flowering recorded in spring and summer. Sand Spurge seeds float, so some dispersal between beaches may occur. Longevity of the species is approximately 5 – 30 years with a primary juvenile period of less than 1 year. Plant growth occurs in spring and summer.	Species not observed during field surveys of the site. Species habitat not present on the site. Due to historic clearing and ongoing school management, considered **Unlikely to Occur**.
Acacia terminalis subsp. *Eastern Sydney*	Sunshine Wattle (Sydney)	E1	E	✔	✓		Sunshine Wattle is found in open coastal eucalypt woodland or forest, usually in sandy soil on creek banks, hillslopes or in shallow soil in rock crevices and sandstone platforms on cliffs (DOE SPRAT Profile 2021).	Species not observed during field surveys of the site. Due to historic clearing and ongoing school management, considered **Unlikely to Occur**.
Callistemon linearifolius	Netted Bottle Brush	V	-		✓		Grows in dry sclerophyll forest on the coast and adjacent ranges. Flowers spring through to summer.	Species not observed during field surveys of the site. Due to

Scientific Name	Common Name	Status		Occurrences			Preferred Habitat	Likelihood of species or species habitat occurring
		BCA	EPBC	PMST	BioNet 10km	Bionet 1.5km		
								historic clearing and ongoing school management, considered **Unlikely to Occur**.
Grammitis stenophylla	Narrow-leaf Finger Fern	E	-		✓		Moist places, usually near streams, on rocks or in trees, in rainforest and moist eucalypt forest.	Species not observed during field surveys of the site. Due to historic clearing and ongoing school management, considered **Unlikely to Occur**.
Prostanthera densa	Villous Mint-bush	V	V		✓		Generally grows in sclerophyll forest and shrubland on coastal headlands and near coastal ranges, chiefly on sandstone, and rocky slopes near the sea. Plants regenerate from rootstock after fire and flower within the first year or two.	Species not observed during field surveys of the site. Due to historic clearing and ongoing school management, considered **Unlikely to Occur**.
Microtis angusii	Angus's Onion Orchid	E1	E		✓		Currently known from only one site at Ingleside, north of Sydney. The Ingleside population occurs on soils that have been modified but were originally those of the restricted ridgetop lateritic soils in the Duffys Forest - Terrey Hills - Ingleside and Belrose areas. These soils support a specific and distinct vegetation type, the Duffys Forest Vegetation Community which is listed as an endangered ecological community under the TSC Act and ranges from open forest to low open forest and rarely woodland.	Species not observed during field surveys of the site. Species habitat not present on the site. Due to historic clearing and ongoing school management, considered **Unlikely to Occur**.
Eucalyptus camfieldii	Camfield's Stringybark	V	V	✔	✓		Occurs mostly in small, scattered stands in exposed situations on sandstone plateaus, ridges and slopes near the coast, often on the boundary of tall coastal heaths or low open woodland (DOE SPRAT Profile 2021).	Species not observed during field surveys of the site. Due to historic clearing and ongoing school management, considered **Unlikely to Occur**.
Eucalyptus nicholii	Narrow-leaved Black Peppermint	V	V				Typically grows in dry grassy woodland, on shallow soils of slopes and ridges. Found primarily on infertile soils derived from granite or metasedimentary rock. Seedling recruitment is common, even in disturbed	Species not observed during field surveys of the site. Due to historic clearing and ongoing

Scientific Name	Common Name	Status		Occurrences			Preferred Habitat	Likelihood of species or species habitat occurring
		BCA	EPBC	PMST	BioNet 10km	Bionet 1.5km		
							soils, if protected from grazing and fire. Tends to grow on lower slopes in the landscape.	school management, considered **Unlikely to Occur**.
Eucalyptus scoparia	Wallangarra White Gum	E1	V		✓	✓	Found in open eucalypt forest, woodland and heaths on well-drained granite/rhyolite hilltops, slopes and rocky outcrops, typically at high altitudes. At lower elevations can occur in less rocky soils in damp situations.	While species observed on site, these consist of planted individuals. **These trees are identified as "Exempt Trees" by Northern Beaches Council.**
Kunzea rupestris		V	V		✓		Grows in shallow depressions on large flat sandstone rock outcrops. Characteristically found in short to tall shrubland or heathland. Flowering occurs in spring. It has indehiscent fruits which resist soil entrapment and so may disperse many metres per week. Resprouts from the base after fire or mechanical damage. Seedlings have also been observed after fire.	Species not observed during field surveys of the site. Due to historic clearing and ongoing school management, considered **Unlikely to Occur**.
Genoplesium baueri	Bauer's Midge Orchid	E1	E	✔	✓		Grows in dry sclerophyll forest and moss gardens over sandstone (OEH Threatened Biodiversity Profile 2021).	Species not observed during field surveys of the site. Due to historic clearing and ongoing school management, considered **Unlikely to Occur**.
Lasiopetalum joycaeae		-	V	✔	✓		Occur in lowland sclerophyll forest and heathland habitats (Atlas of Living Australia).	Species not observed during field surveys of the site. Due to historic clearing and ongoing school management, considered **Unlikely to Occur**.
Grevillea caleyi	Caley's Grevillea	E4	CE		✓	✓	Occur on the ridgetop between elevations of 170 to 240m asl, in association with laterite soils and a vegetation community of open forest, generally dominated by *Eucalyptus sieberi* and *E. gummifera*. Commonly found in the endangered Duffys Forest ecological community.	Species not observed during field surveys of the site. Species habitat not present on the site. Due to historic clearing and ongoing school management, considered **Unlikely to Occur**.

Scientific Name	Common Name	Status		Occurrences			Preferred Habitat	Likelihood of species or species habitat occurring
		BCA	EPBC	PMST	BioNet 10km	Bionet 1.5km		
Macadamia tetraphylla	Rough-shelled Bush Nut	V	V	✓	✓		Found in subtropical rainforest, usually near the coast.	Species not observed during field surveys of the site. Species habitat not present on the site. Due to historic clearing and ongoing school management, considered **Unlikely to Occur**.
Persoonia hirsuta	Hairy Geebung	E1,P,3	E	✓			Dry sclerophyll forest and woodland with a shrubby understorey. It also favours disturbed heath, shrub thickets and sandstone scrubs. Sydney sandstone ridge-top Woodland and Sydney sandstone open forests (DOE SPRAT Profile 2021).	Species not observed during field surveys of the site. Due to historic clearing and ongoing school management, considered **Unlikely to Occur**.
Pimelea curviflora var. *curviflora*		V	V	✓	✓	✓	Occurs on ridge tops and upper slopes in open forest and woodland on sandy soil derived from sandstone, on shale/lateritic soils and shale/sandstone transition soils. It often grows among dense grasses and sedges making it difficult to detect (DOE SPRAT Profile 2021).	Species not observed during field surveys of the site. Due to historic clearing and ongoing school management, considered **Unlikely to Occur**.
Rhodamnia rubescens	Scrub Turpentine	E4A	-	✓	✓		Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils (OEH Threatened Biodiversity Profile 2021).	Species not observed during field surveys of the site. Due to historic clearing and ongoing school management, considered **Unlikely to Occur**.
Syzygium paniculatum	Magenta Lilly Pilly	E1	V	✓	✓		On the central coast Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities (OEH Threatened Biodiversity Profile 2021).	Species not observed during field surveys of the site. Due to historic clearing and ongoing school management, species considered **Unlikely to Occur**.
BIRDS								

Scientific Name	Common Name	Status		Occurrences			Preferred Habitat	Likelihood of species or species habitat occurring
		BCA	EPBC	PMST	BioNet 10km	Bionet 1.5km		
Anthochaera phrygia	Regent Honeyeater	E4	CE	✔	✔		Inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Also found in drier coastal woodlands and forests in some years. Dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River She-oak. Breeds in Box-Ironbark and other temperate woodlands and riparian gallery forest dominated by River She-oak, usually nest in tall mature eucalypts and She-oaks (DOE SPRAT Profile 2021).	Due to historic clearing and ongoing school management and activities, species considered **Unlikely to Occur**.
Apus pacificus	Fork-tailed Swift	P	C,J,K	✔	✔	✔	Mostly occur over inland plains but sometimes above foothills or in coastal areas, over settled areas, over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. They are also found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. They sometimes occur above rainforests, wet sclerophyll forest or open forest or plantations of pines (DOE SPRAT Profile 2021).	Aerial species. **Species has potential to occur.**
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V,P	-		✔		Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. Considered u**nlikely to Occur.**
Botaurus poiciloptilus	Australasian Bittern	E1,P	E	✔	✔		Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha spp.*) and spikerushes (*Eleocharis spp.*) (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. Considered u**nlikely to Occur.**

Scientific Name	Common Name	Status		Occurrences			Preferred Habitat	Likelihood of species or species habitat occurring
		BCA	EPBC	PMST	BioNet 10km	Bionet 1.5km		
Burhinus grallarius	Bush Stone-curlew	E1,P	-		✔		Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber (OEH Threatened Biodiversity Profile 2021).	
Callocephalon fimbriatum	Gang-gang Cockatoo	V,P,3	-		✔	✔	Usually frequents forested areas with old growth attributes required for nesting and roosting. Also utilises less heavily timbered woodlands and urban fringe areas to forage but appears to favour well-timbered country through which it habitually flies as it moves about (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. Considered u**nlikely to Occur.**
Calyptorhynchus lathami	Glossy Black-Cockatoo	V,P,2	-		✔	✔	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of She-oak occur. Black She-oak (*Allocasuarina littoralis*) and Forest She-oak (*A. torulosa*) are important foods (OEH Threatened Biodiversity Profile 2022).	Species, or evidence of species utilization of the site not obse4rved during field surveys. Species considered **unlikely to occur.**
Daphoenositta chrysoptera	Varied Sittella	V,P	-		✔	✔	Varied Sittella inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland (OEH Threatened Biodiversity Profile 2022).	Species habitat not present on site. Species considered u**nlikely to occur.**
Esacus magnirostris	Beach Stone-curlew	E4A,P	-		✔		Found exclusively along the coast, on a wide range of beaches, islands, reefs and in estuaries, and may often be seen at the edges of or near mangroves. They forage in the intertidal zone of beaches and estuaries, on islands, flats, banks and spits of sand, mud, gravel or rock, and among mangroves. Beach Stone-curlews breed above the littoral zone, at the backs of beaches, or on sandbanks and islands, among low vegetation of grass, scattered shrubs or low trees; and among open mangroves (OEH Threatened Biodiversity Profile 2022).	Species habitat not present on site. Species considered u**nlikely to occur.**

Scientific Name	Common Name	Status		Occurrences			Preferred Habitat	Likelihood of species or species habitat occurring
		BCA	EPBC	PMST	BioNet 10km	Bionet 1.5km		
Glossopsitta pusilla	Little Lorikeet	V,P	-		✔	✔	The Little Lorikeet occurs primarily in the canopy of open Eucalyptus forests and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity (OEH Threatened Biodiversity Profile 2022).	Species habitat not present on site. Species considered u**nlikely to occur.**
Haliaeetus leucogaster	White-bellied Sea-Eagle	V,P	LM	✔	✔	✔	White-bellied Sea Eagles occur at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest) (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. No nesting sites identified on or adjacent to the Subject Site. Species considered u**nlikely to occur.**
Hieraaetus morphnoides	Little Eagle	V,P	-		✔	✔	The Little Eagle occupies open eucalypt forest, woodland or open woodland. She-oak or Acacia woodlands and riparian woodlands of interior NSW are also used. Nesting in tall living trees within a remnant patch, where pairs build a large stick nest in winter (OEH Threatened Biodiversity Profile 2021).	Suboptimal habitat present on site, with historic and ongoing disturbance. Species not detected during field inspection or previously recorded in the Study Area Species considered **unlikely to occur.**
Ixobrychus flavicollis	Black Bittern	V,P	-		✔	✔	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 (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**
Lathamus discolor	Swift Parrot	E1,P,3	CE	✔	✔	✔	Swift Parrots occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. The species migrate to Tasmania during breeding Nov-Jan (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**

Scientific Name	Common Name	Status		Occurrences			Preferred Habitat	Likelihood of species or species habitat occurring
		BCA	EPBC	PMST	BioNet 10km	Bionet 1.5km		
Lophoictinia isura	Square-tailed Kite	V,P,3	-		✔	✔	Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V,P	-		✔		Uncommon nomad or resident in dry forest and woodlands particularly along rivers in northern, central and eastern Australia (Slater 2003).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**
Neophema pulchella	Turquoise Parrot	V,P,3	-		✔		The Turquoise Parrot, lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland, nesting in hollow logs (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**
Ninox connivens	Barking Owl	V,P,3	-		✔		Barking Owls inhabit 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. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (OEH Threatened Biodiversity Profile 2022).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**
Ninox strenua	Powerful Owl	V,P,3	-		✔		Powerful Owls are found in a variety of forest types including woodland, open sclerophyll forest, tall open wet forest, rainforest and occasionally fragmented areas. Territories may be as large as 1450 ha and nesting occurs in large tree hollows of old, mature trees (OEH Threatened Biodiversity Profile 2021).	Species foraging habitat present on site. Species has p**otential to occur.**

Scientific Name	Common Name	Status		Occurrences			Preferred Habitat	Likelihood of species or species habitat occurring
		BCA	EPBC	PMST	BioNet 10km	Bionet 1.5km		
Pandion cristatus	Eastern Osprey	V,P,3	-		✔		Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. They exhibit a preference for coastal cliffs and elevated islands in some parts of their range, but may also occur on low sandy, muddy or rocky shores and over coral cays. They may occur over atypical habitats such as heath, woodland or forest when travelling to and from foraging sites (DOE SPRAT Profile 2021).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**
Petroica boodang	Scarlet Robin	V,P	-		✔		The Scarlet Robin inhabits dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species found in both mature and regrowth vegetation, occasionally occurring in mallee or wet forest communities, or in wetlands and tea-tree swamps (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**
Ptilinopus magnificus	Wompoo Fruit-Dove	V,P	-		✔		Occurs in, or near rainforest, low elevation moist eucalypt forest and brush box forests (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**
Ptilinopus regina	Rose-crowned Fruit-Dove	V,P	-		✔		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 (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**

Scientific Name	Common Name	Status		Occurrences			Preferred Habitat	Likelihood of species or species habitat occurring
		BCA	EPBC	PMST	BioNet 10km	Bionet 1.5km		
Ptilinopus superbus	Superb Fruit-Dove	V,P	-		✔	✔	Inhabits rainforest and similar closed forests. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**
Rostratula australis	Australian Painted Snipe	E1,P	E	✔	✔	✔	Inhabits fringes of shallow inland wetlands, swamps, dams and nearby marsh areas where there is a cover of grasses, lignum, low scrub or open timber (DOE SPRAT Profile 2021).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**
Tyto novaehollandiae	Masked Owl	V,P,3	-		✔	✔	Masked Owls inhabit dry eucalypt forests and woodlands roosting in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**
MAMMALS								
Cercartetus nanus	Eastern Pygmy-possum	V,P	-		✔		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, except in north-eastern NSW where they are most frequently encountered in rainforest. They may occupy small patches of vegetation in fragmented landscapes and although the species prefers habitat with a rich shrub understory, they are known to occur in grassy woodlands and the presence of Eucalypts alone is sufficient to support populations in low densities (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**

Scientific Name	Common Name	Status		Occurrences			Preferred Habitat	Likelihood of species or species habitat occurring
		BCA	EPBC	PMST	BioNet 10km	Bionet 1.5km		
Chalinolobus dwyeri	Large-eared Pied Bat	V,P	V	✔	✔		The Large-eared Pied Bat occupies patchy distribution in NSW. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Hirundo ariel*), frequenting low to mid-elevation dry open forest and woodland close to these features (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**
Dasyurus maculatus	Spotted-tailed Quoll	V,P	E	✔	✔		The Spotted-tailed Quoll is recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites. Females occupy home ranges up to about 750 hectares and males up to 3500 hectares; usually traverse their ranges along densely vegetated creek lines (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V,P	-		✔		The Eastern False Pipistrelle prefers moist habitats, with trees taller than 20 m. Generally, roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**
Isoodon obesulus obesulus	Southern Brown Bandicoot (eastern)	E1,P	E	✔	✔		Known to inhabit a variety of habitats including heathland, shrubland, sedgeland, heath open forest and woodland and are usually associated with infertile, sandy and well drained soils, but can be found in a range of soil types. Within these vegetation communities they typically inhabit areas of dense ground cover (DOE SPRAT Profile 2021).	Species habitat not present on site. Species not previously recorded on the Subject Site. Species considered **unlikely to occur.**
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V,P	-		✔		The Eastern Coast Free-tailed Bat occurs in dry sclerophyll forest, woodland, swamp forests and	**Potential to occur.**

Scientific Name	Common Name	Status		Occurrences			Preferred Habitat	Likelihood of species or species habitat occurring
		BCA	EPBC	PMST	BioNet 10km	Bionet 1.5km		
							mangrove forests east of the Great Dividing Range. Roosting mainly in tree hollows but will also roost under bark or in man-made structures (OEH Threatened Biodiversity Profile 2021).	
Miniopterus australis	Little Bent-winged Bat	V,P	-		✔		The Little Bent-winged Bat can be found in various habitats including moist eucalypt forest, rainforest, wet and dry sclerophyll forest. Roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day (OEH Threatened Biodiversity Profile 2021).	Species not previously recorded from the Study Area. Species considered **unlikely to occur.**
Miniopterus orianae oceanensis	Large Bent-winged Bat	V,P	-		✔		The Large Bent-winged Bat forms discrete populations centered on a maternity roost that is used annually in spring and summer. Roosting Habitats are primarily caves derelict mines, storm-water tunnels, buildings and other man-made structures are also used (OEH Threatened Biodiversity Profile 2021).	Species not previously recorded from the Study Area. Very limited habitat present for this species. Species considered **unlikely to occur.**
Myotis macropus	Southern Myotis	V,P	-		✔		Roosts close to water in caves, mines, tree hollows, storm water channels, bridges, buildings or in dense foliage. Forages over streams and pools catching insects and fish (OEH Threatened Biodiversity Profile 2021).	Species foraging habitat present. Considered as having **potential to occur.**
Petaurus norfolcensis	Squirrel Glider	V,P	-		✔		Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest, west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas (OEH Threatened Biodiversity Profile 2021).	Species not previously recorded from the Study Area. Species considered **unlikely to occur.**
Petrogale penicillata	Brush-tailed Rock-wallaby	-	V	✔			The Brush-tailed Rock-wallaby occupies rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. Sheltering or basking during the	Species habitat not present on site. Species considered **unlikely to occur.**

Scientific Name	Common Name	Status		Occurrences			Preferred Habitat	Likelihood of species or species habitat occurring
		BCA	EPBC	PMST	BioNet 10km	Bionet 1.5km		
							day in rock crevices, caves and overhangs (OEH Threatened Biodiversity Profile 2021).	
Phascolarctos cinereus	Koala	V,P	V	✔	✔		Koalas Inhabit eucalypt woodlands and forests feeding on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size. While Koalas primarily feed on eucalyptus species, they can use other species as shelter trees (OEH Threatened Biodiversity Profile 2021).	Species habitat present on site but on-going disturbance associated with school fencing, high use activities and ongoing maintenance suggests this species is unlikely to occur. Species considered **unlikely to occur.**
Pteropus poliocephalus	Grey-headed Flying-fox	V,P	V	✔	✔		The Grey-headed Flying fox can be found in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosts in large camps and disperses nightly up to 20km to feed in flowering eucalypts (OEH Threatened Biodiversity Profile 2021).	Suitable feed trees on the Subject Site and within the Study Area. Considered **likely to occur.**
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V,P	-		✔		Yellow-bellied Sheathtail-bats occur singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. The species forages in most habitats across its very wide range, with and without trees (OEH Threatened Biodiversity Profile 2021).	Species not previously recorded in the Study Area. Species considered **unlikely to occur.**
Nyctophilus bifax	Eastern Long-eared Bat	V	-				Lowland subtropical rainforest and wet and swamp eucalypt forest, extending into adjacent moist eucalypt forest. Coastal rainforest and patches of	Suitable habitat on the Subject Site and within the Study Area. **Likely to occur.**

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							coastal scrub are particularly favoured. Roosts in tree hollows, the hanging foliage of palms, in dense clumps of foliage of rainforest trees, under bark and in shallow depressions on trunks and branches, among epiphytes, in the roots of strangler figs, among dead fronds of tree ferns and less often in buildings.	
Scoteanax rueppellii	Greater Broad-nosed Bat	V,P	-		✔		Greater-Broad-nosed Bats usually occur in tall wet forest, extending into drier forest along gullies. The species forages along creek and river corridors and roosts in tree hollows (OEH Threatened Biodiversity Profile 2021).	Species not previously recorded in the Study Area. Species considered **unlikely to occur.**
Vespadelus troughtoni	Eastern Cave Bat	V,P	-		✔		A cave-roosting species 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. Occasionally found along cliff-lines in wet eucalypt forest and rainforest (OEH Threatened Biodiversity Profile 2021).	Species not previously recorded in the Study Area. Species considered u**nlikely to occur.**
REPTILES								
Cacophis harriettae	White-crowned Snake	V	-				Favours low to mid-elevation dry eucalypt forest and woodland, particularly areas with a varied and well-developed litter layer, where their prey of small lizards may be more abundant. Also occasionally found in moist eucalypt forest and coastal heathland.	**Unlikely to Occur.** Site does not occur within the known range of this species. Species habitat not present on site.
Varanus rosenbergi	Rosenberg's Goanna	V,P	-		✔		Found in heath, open forest and woodland. Associated with termites, the mounds of which this species nests in. Termite mounds are a critical habitat component (OEH Threatened Biodiversity Profile 2021).	**Unlikely to Occur.** Species habitat not present on site. No termite mounds present on site.

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AMPHIBIANS								
Heleioporus australiacus	Giant Burrowing Frog	V,P	V	✔	✔		The Giant Burrowing Frog inhabits ephemeral or semi-permanent small sandy streams in heathland or open woodland. Foraging may occur several hundred metres from a breeding site within the same habitat (DOE SPRAT Profile 2021).	Species habitat not present on site. The creek line is too saline with limited shelter vegetation for frogs. Species considered u**nlikely to occur.**
Litoria aurea	Green and Golden Bell Frog	E1,P	V	✔	✔		The Green and Golden Bell Frog Inhabits permanent or ephemeral swamps, dams and slow flowing streams with emergent vegetation such as reeds, particularly those containing bulrushes (*Typha spp.*) and Spikerushes (*Eleocharis spp.*). Optimal habitat includes waterbodies that are unshaded, free of predatory fish such as Plague Minnow (*Gambusia holbrooki*), have a grassy area nearby and sheltering sites available. Can occur in highly disturbed areas. It inhabits a variety of forest types including coastal forest, open woodland and cleared areas (DOE SPRAT Profile 2021).	Species habitat not present on site. The creek line is too saline with limited shelter vegetation for frogs. Species considered **unlikely to occur.**
Pseudophryne australis	Red-crowned Toadlet	V,P	-	✔			Occurs in open forests, mostly on Hawkesbury and Narrabeen sandstones. Inhabits periodically wet drainage lines below sandstone ridges that often have shale lenses or capping (OEH Threatened Biodiversity Profile 2021).	Species habitat not present on site. The creek line is too saline with limited shelter vegetation for frogs. Species considered **unlikely to occur.**

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J – JAMBA

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