ACS Environmental Pty Ltd

# FLORA AND FAUNA ASSESSMENT

# FOR

# DEVELOPMENT APPLICATION FOR PROPOSED

# ADDITIONS TO AN EXISTING DWELLING

# AND CONSTRUCTION OF SECONDARY DWELLING

# AT

# 48 LINDLEY AVENUE, NARRABEEN

**PREPARED FOR:**

Nathan Luck
48 Lindley Avenue,
Narrabeen NSW 2101

**5th MAY 2022**

# ACS Environmental Pty Ltd

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The principal of 'ACS Environmental P/L has worked in the area of floristic and faunal impact assessment services for a period of greater than 20 years. He also has over 30 years of experience in scientific research (ecological) and teaching in biological science.

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# EXECUTIVE SUMMARY

In March 2022, ACS Environmental was commissioned by Nathan Luck to survey for flora and fauna and undertake a biodiversity impact assessment for the vegetated portions of the rear section of Lot 2 in DP 502501 at 48 Lindley Avenue, Narrabeen.

The subject property has an total area of 663m$^2$ with the existing residence occurring at the front of the property. Within this site area, the footprint of the secondary dwelling is only about 100m$^2$.

The proposal is to for ground floor additions in order to enlarge bedrooms and ensuite, and demolish the existing southern wall and re-use existing doors and windows.

The secondary dwelling is proposed for the rear yard and would be located some 10m below the level of the existing balcony of the existing residence.

A total of 4 trees will require removal to accommodate the secondary dwelling (Willis 2022). These include 2 exotic species and two indigenous species, an individual of Illawarra Flame Tree (*Brachychiton acerifolius*), and one of Cheese Tree (*Glochidion ferdinandi*) to 10m tall at the rear of the property.

The general remnant natural vegetation of the subject land on the upper sections of the property is representative of that which occurs on Hawkesbury Sandstone substrates, most likely described as 'Coastal Sandstone Foreshores Forest' (OEH 2016 Code S_DSF06), whereas on the lower sections of the slope, the remnant forested community more likely established on Narrabeen sediments, may represent 'Coastal Flats Tall Moist Forest' (OEH 2016 Code: S_WSF36).

A total of 6 indigenous plant species, many occurring as single individuals, were recorded at the rear of the subject site. The most frequent tree species was Cheese Tree, with a total of 5 individuals occurring at the rear vegetated sections of the site as relatively mature trees, most lopped to enhance the view to the north.

A total of 7 exotic High Threat Weeds (HTW) weed species (DPE 2022) were recorded at the rear of the surveyed area).

The DPIE Bionet Atlas of NSW Wildlife (2022) records for an area of 5km radius around the subject site indicate that 17 species of conservation significance have been recorded within a radius of 5km of the site within the last 20 years.

For most of these 17 species, the highly modified forested habitat of the subject site is unsuitable for their occurrence. Most threatened flora species recorded within a 10 x

10km area centred around the subject land occur further to the west in national parks and natural bushland areas occurring on sandstone substrates.

There is a relative connectivity of the natural bushland occurring within the residential locality with extensive bushland occurring Jamieson Park to the west and fragmented connectivity throughout the locality at Collaroy Plateau and Wheeler Heights.

As part of the biodiversity impact assessment, the fauna survey was undertaken to record any fauna species currently utilising the site and to assess the habitat value of the site for threatened and migratory species listed in the database for the area.

The low forest vegetation provides foraging and sheltering habitat for fauna and provides connectivity for faunal movement between and within surrounding fragmented bushland.

The most commonly recorded bird species utilising resources in the forested area of the subject land and surrounds were the Noisy Miner (*Manorina melanophris*), Red Wattlebird (*Anthochaera carunculata*), Little Wattlebird (*Anthochaera chrysoptera*) and Rainbow Lorikeet (*Trichoglossus haematodus*). These bird species are aggressive nectar-feeding species which may exclude other nectar-feeding birds from flowering trees and shrubs in the area.

Database searches at Local Government, State and Federal level were undertaken to identify threatened species that had been recorded previously in the area. The Bionet Atlas of NSW Wildlife database 2019 (Dept Planning, Industry and Environment) listed thirty seven (38) species (omitting all unlikely animals such as Whales, Penguins, Seals and migratory shorebirds) of terrestrial and avifauna listed as threatened under the BC Act within a 5 km radius centred around the subject site

Threatened species identified as having an occasional potential to occur on the site were examined to assess any possible impact from the proposed development. These species included the Powerful Owl, Large Bentwing Bat and the Grey-headed Flying Fox.

It is considered that for each of the threatened fauna species that may occasionally forage within the small area of subject land, the development would be unlikely to have an adverse effect on the life cycle of any of these individual species, nor impact significantly on the area of their respective habitat, nor place any local population of these species at threat of extinction.

It is considered that for potential impacts to any threatened ecological communities, threatened populations or threatened flora or fauna, concurrence from the Director General of the Department of Planning and Environment is not required, and as such, it is

considered that further assessment in the form of applying the Biodiversity Offsets Scheme (BC Act 2016) or preparation of a Species Impact Statement is not necessary.

Environmental criteria in relation to requirement for biodiversity offsets is assessed as follows:

- The area of property and area proposed for development is less than 1ha and less than 0.25ha respectively, areas too small to trigger offsets;
- The subject land is not marked on the Biodiversity Values Map as containing any significant biodiversity value and so not triggering biodiversity offsets; and
- It is assessed and considered that no threatened ecological community, threatened species (of both flora and fauna) or threatened populations would be significantly impacted by the small area of the proposed development at the eastern vegetated section of the subject land.

A such, it is considered that biodiversity offsets in relation to the development are not required.

In relation to criteria listed in WDCP (2011):

- E1 - Preservation of Trees or Bushland Vegetation
- E4 - Wildlife Corridors
- E6 - Retaining unique environmental features
- E2 - Prescribed Vegetation
- E3 - Threatened species or ecological communities listed under State or Commonwealth legislation, and
- E5 - Native Vegetation,

all of the above clauses in relation to the proposed development can be satisfied in compliance with the DCP.

**GLOSSARY**

BAM - Biodiversity Assessment Method (2017) - supports the BC Act (2016).

BC Act - *Biodiversity Conservation Act (2016)* - legislation enacted in August 2017

CEEC - Critically Endangered Ecological Community

DAWE - Commonwealth Department of Agriculture, Water and Environment

DPE - Department of Planning and Environment

E (threatened species status) - Endangered species

EEC - Endangered Ecological Community as listed by the BC Act and EPBC Act

EPBC Act - Environmental Protection & Biodiversity Conservation Act (1999). Enacted to protect and manage nationally and internationally (migratory) flora, fauna and ecological communities, defined in the Act as matters of national environmental significance (NES)

Habitat - areas occupied, either territorially, periodically or occasionally, by a species, population or ecological community

KTP - Key threatening process, a process that threatens the survival, life cycle, abundance or potential evolutionary development of native species, populations or ecological communities (Dept of Environment and Conservation 2004). KTP's are listed under the BC Act and the EPBC Act.

Migratory species - listed under the EPBC Act and relating to international agreements to which Australia is a signatory. Includes the Japan-Australia Migratory Bird Agreement (JAMBA), Chine-Australia Migratory Bird Agreement (CAMBA) Republic of Korea Migratory Bird Agreement (ROKAMBA) and Bonn Convention on the Conservation of Migratory Species of Wild Animals (BCCMSWA).

OEH - State Office of Environment and Heritage

PCT - Plant Community Type identified as such using the Bionet Vegetation Classification system (DPIE 2019)

RoTAP - Rare or Threatened Australian Plants

Threatened species, populations or ecological communities - Entities listed by the BC Act and EPBC Act as 'Vulnerable to decreasing population growth in time', Endangered as population growth decreasing rapidly leading to eventual extinction' or 'Critically Endangered, a more extreme rate of population decrease than the former'.

V (threatened species status) - Vulnerable

WDCP 2011 - Warringah Development Control Plan (2011)

WLEP 2011 - Warringah Local Environment Plan (2011)

# INTRODUCTION

## 1.1 Proposed development

In March 2022, ACS Environmental was commissioned by Nathan Luck to survey for flora and fauna and undertake a biodiversity impact assessment for the vegetated portions of Lot 2 in DP 502501 at 48 Lindley Avenue, Narrabeen for the proposal to construct a secondary dwelling.

The subject property has an area of 663m$^2$ with the existing residence occurring at the front of the property.

Figure 1 is an aerial image of the current dwelling and surrounding bushland.

The proposal is to for ground floor additions in order to enlarge bedrooms and ensuite, and demolish the existing southern wall and re-use existing doors and windows.

A secondary dwelling is proposed for the rear yard and would be located some 10m below the level of the existing balcony of the existing residence.

Figure 2 is an architectural representation of the location and extent of the proposed secondary dwelling (granny flat).

Architectural plans submitted with this application should be consulted for detail (Peter Downes Designs 2019).

A total of 4 trees will require removal to accommodate the construction of the secondary dwelling. These include 2 exotic species and two indigenous species, an individual of Cheese Tree (*Glochidion ferdinandi*), and one of Illawarra Flame Tree (*Brachychiton acerifolius*) to 9m tall at the rear of the property (Willis 2022).

Figure 3 indicates the location of existing canopy trees in relation to the current and proposed development (Willis 2022).

Figure 4 is an aerial depiction of the subject area showing the land in relation to established development in the local area (SIXmaps DPIE 2022).

## 1.2 Concomitant reports

Concomitant reports to be read in conjunction with this assessment report include the following:

- Peter Downes (2019) Proposed alterations and additions to existing dwelling at 48 Lindley Avenue, Narrabeen

- Northern beaches Council (2019) Pre-lodgement Advice Application No. PLM2019/0176 - Alterations and additions to an existing dwelling house

- Willis, J. (2022) Arboricultural Impact Assessment Report for 48 Lindley Avenue, Narrabeen

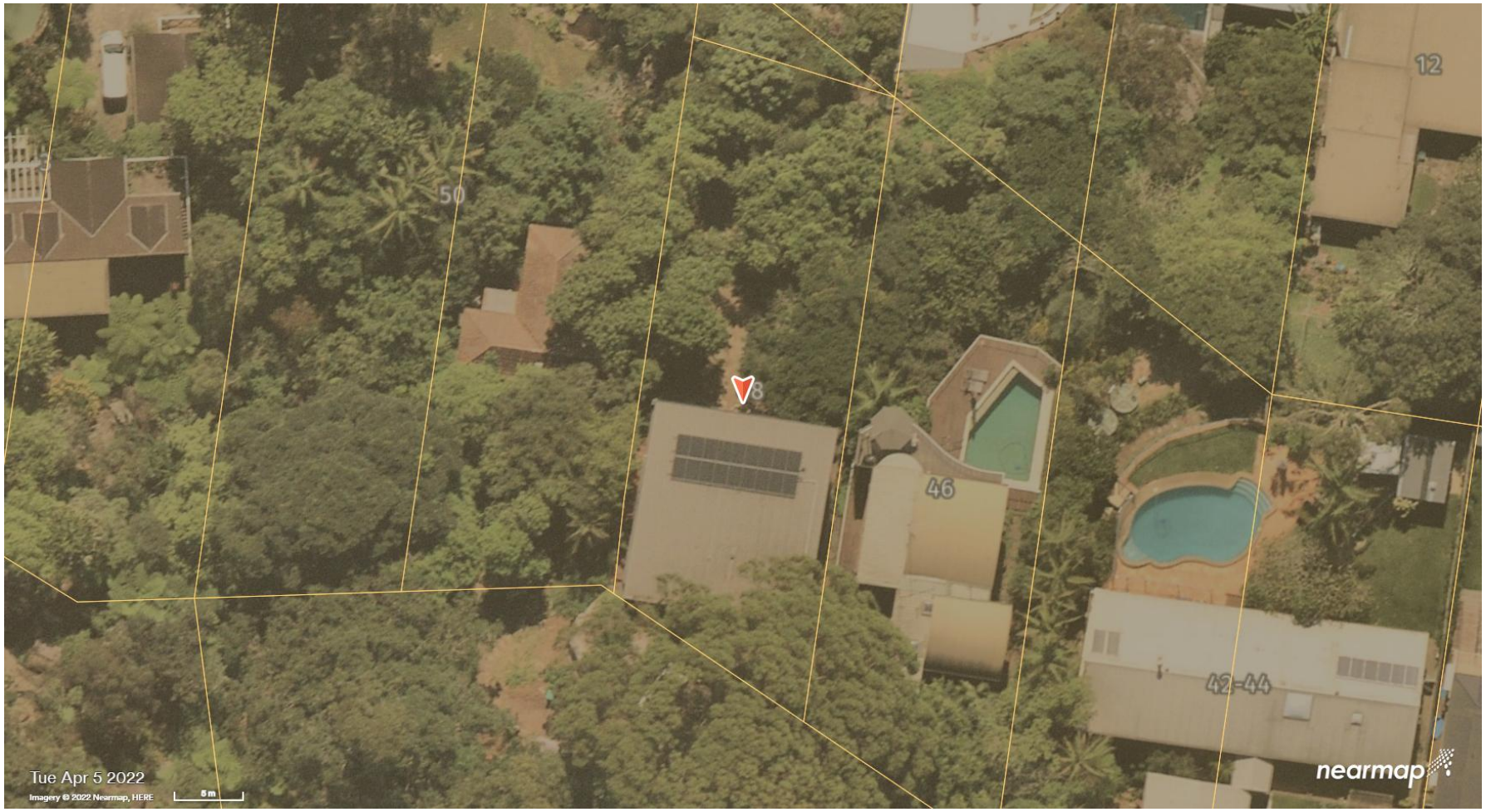


**Figure 1 -** Indicates an aerial image of the subject land at 48 Lindley Avenue, Narrabeen, the subject property indicated by red marker and bounded by yellow outline (Nearmap April 2022). Note presently cleared area at rear of dwelling.

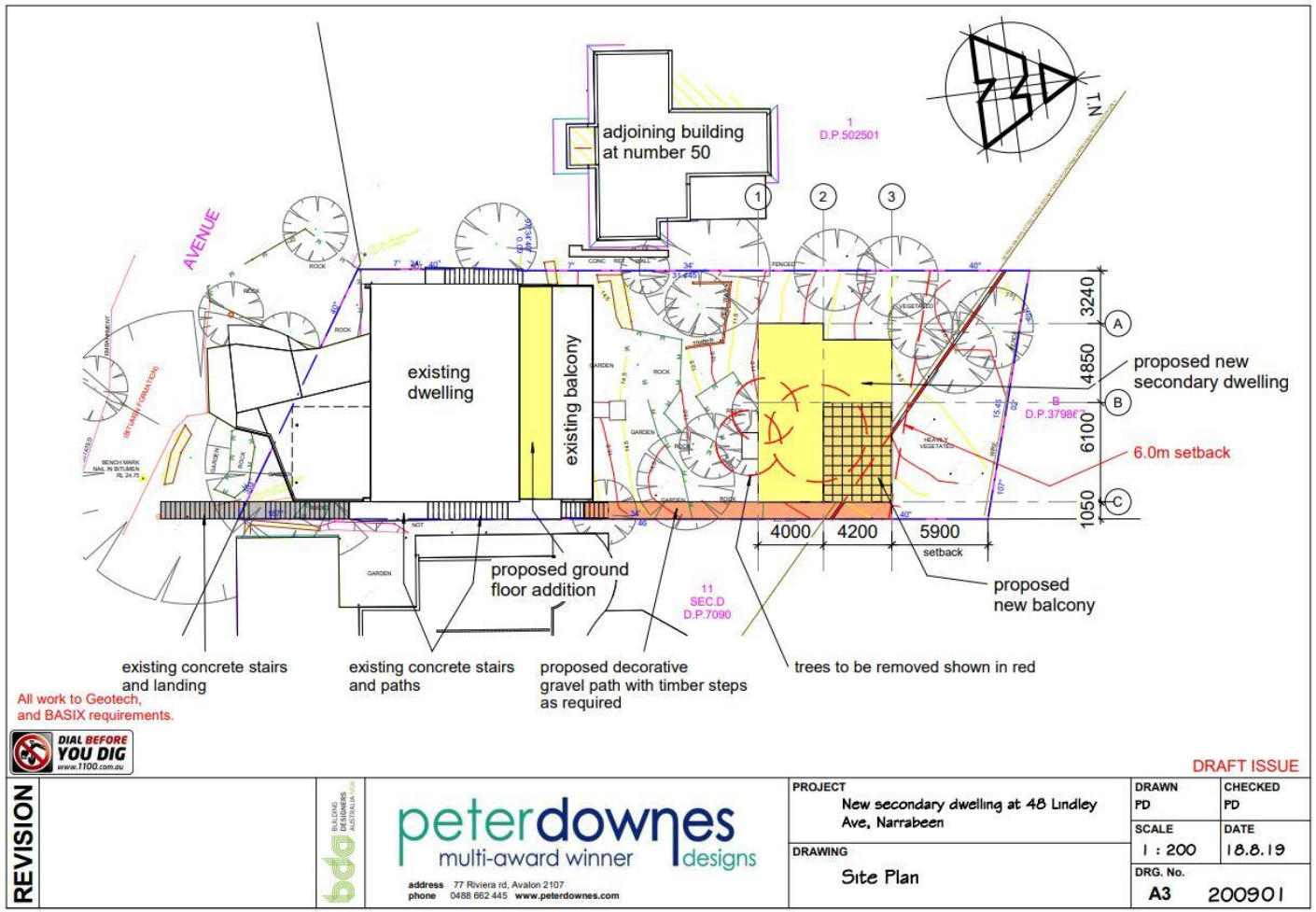


**Figure 2 -** Indicates a schematic representation of the site plan showing the existing house footprint layout and proposed ground floor additions as well as the location of the proposed secondary dwelling (final plans prepared by Peter Downes Designs 2019) (see architectural plans for detail)

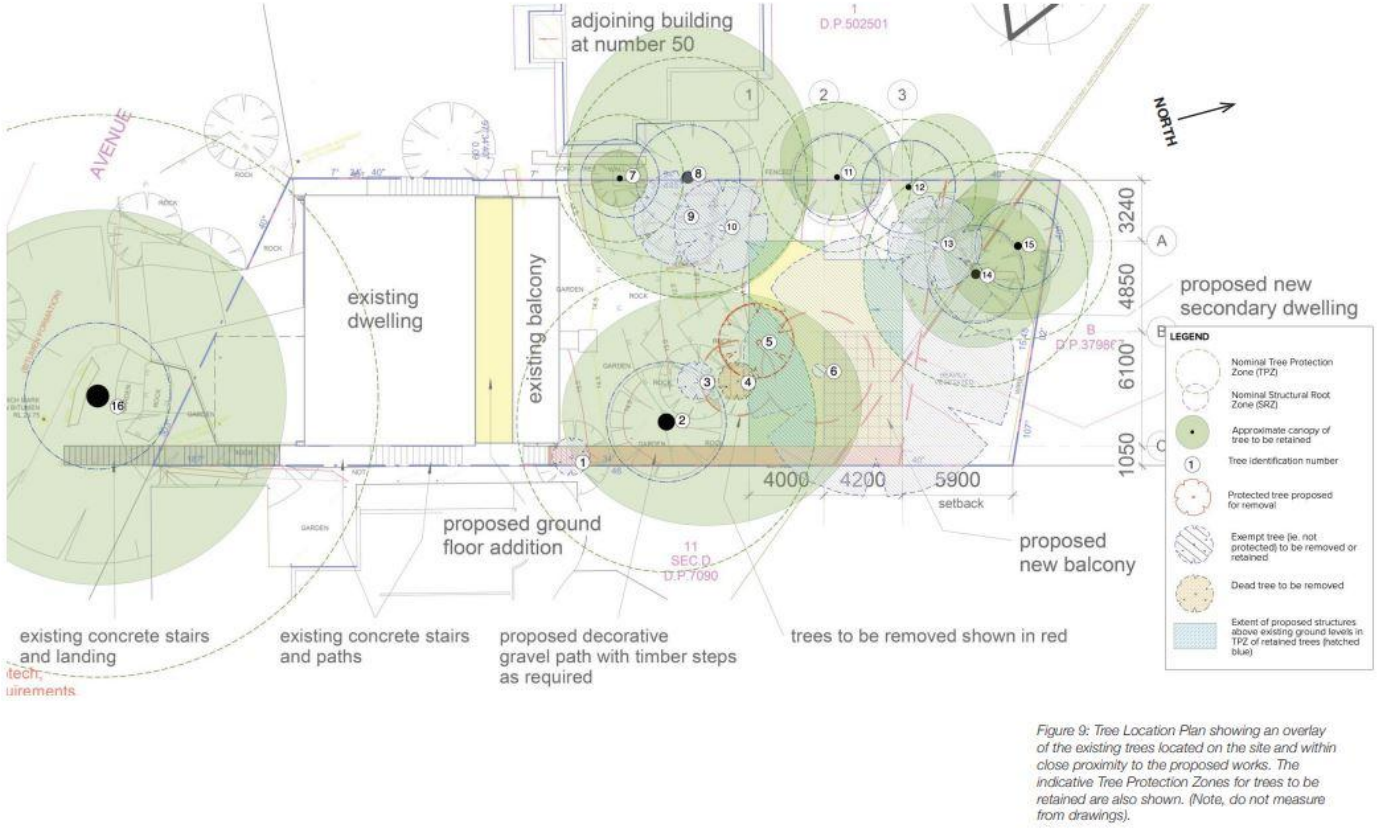


*Figure 9: Tree Location Plan showing an overlay of the existing trees located on the site and within close proximity to the proposed works. The indicative Tree Protection Zones for trees to be retained are also shown. (Note, do not measure from drawings).*

**Figure 3 -** Indicates a schematic representation of the subject property showing the existing house footprint as well as the proposed secondary dwelling house footprint layout as well as existing canopy trees and their respective TPZ's (Tree Protection Zones) (trees numbered as in the arboricultural assessment of the proposal by Willis 2022)


**Figure 4 -** Indicates an aerial image of the surrounding development in the vicinity of 48 Lindley Avenue, Narrabeen (from SIXmaps DPE 2022)

## 1.3 Purpose of biodiversity impact assessment report

The purpose of the flora and fauna surveys and ecological impact assessment is to document existing and expected biota and to ensure all necessary safeguards are described and complied with in relation to the proposal as required by Warringah Development Control Plan 2011 (WDCP 2011) and Warringah Local Environment Plans 2000 and 2011 (WLEP 2000 & WLEP 2011).

## 1.4 Statutory and legislative requirements

Planning controls provided by State and Commonwealth Legislation include the following:

- Environmental Planning and Assessment Act (EP & A Act) (1979),
- Commonwealth Environment Protection and Biodiversity Conservation Act (EPBC Act) (1999),
- Biodiversity Conservation Act (BC Act) (2016). The BC Act (2016) includes Preliminary Determinations of the NSW Scientific Committee (to May 2022) as well as Provisional Listings of Endangered Species on an emergency basis (to May 2022),

  The objectives of this Act are:

  - to provide for the conservation of threatened species, populations and ecological communities of animals and plants. The Act sets out a number of specific objects relating to the conservation of biological diversity and the promotion of ecologically sustainable development.
- Planning for Bushfire Protection (2019).
- Biosecurity Weeds Act 2015 (NSW)

  The objectives of this Act are:
  - to reduce the negative impact of weeds on the economy, community and environment of this State by establishing control mechanisms to:
  - prevent the establishment in this State of significant new weeds, and
  - restrict the spread in this State of existing significant weeds, and
  - reduce the area in this State of existing significant weeds,
  - to provide for the monitoring of and reporting on the effectiveness of the management of weeds in this State

Local Council planning controls include the:

- Warringah Council Local Environmental Plan (WLEP 2000); Warringah Council Local Environment Plan 2011 (WLEP 2011) and Warringah Development Control Plan (WDCP 2011).

WDCP (2011) includes the following clauses that must be addressed:

- E1 - Preservation of Trees or Bushland Vegetation
- E4 - Wildlife Corridors
- E6 - Retaining unique environmental features
- E2 - Prescribed Vegetation
- E3 - Threatened species or ecological communities listed under State or Commonwealth legislation, and
- E5 - Native Vegetation

This flora and fauna assessment report includes an account of:

- Threatened flora and fauna species, populations, endangered ecological communities and their habitats, as listed under the Biodiversity Conservation Act (BC Act), 2016;
- Nationally significant flora species, as listed under the Environment Protection and Biodiversity Conservation Act (EPBC Act), 1999;
- Rare or threatened Australian plants (RoTAP) as listed in Briggs and Leigh (1996); and
- Any regionally or locally significant species occurring in the Northern Beaches Council LGA.

## 1.5 Objectives of the study

- To carry out detailed flora and fauna surveys on the subject land;
- To prepare a comprehensive report qualifying potential impacts and describing mitigation measures in relation to the above assessments.

## 1.6 Scope of the study

The survey work was undertaken to provide Nathan luck with current and detailed information on the following:

- Identification of the flora and fauna that occur at the subject sites including documentation of species lists and mapping of identifiable plant communities;
- Identification of Threatened (Endangered and Vulnerable) species, populations, communities and habitats as listed in Schedules 1 & 2 of the Biodiversity Conservation Act 2016 (BC Act) including Preliminary Determinations of the NSW Scientific Committee, and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), ROTAP species (Briggs & Leigh 1996) and regionally and locally significant species that could potentially be impacted upon by the proposed development;
- Identify listed migratory species (as listed in international treaties referred to in the EPBC Act);

- Identification of fauna species, including species of amphibians, reptiles, birds or mammals, not directly recorded during surveys but that could potentially occur in the study area as indicated by the presence of associated habitat;
- Preparation of a report describing vegetation communities on the subject land indicating their current condition and level of degradation;
- Recording of the area and extent of Biosecurity (and other significant High Threat Exotic) weed species in the study area;
- Assessment of potential impacts of the proposal on existing flora and fauna within the study area;
- Submission of draft report;
- Incorporation of relevant review comments and amendment of draft report; and
- Submission of a final report within 1 week of receiving review comments.

## 1.7 Study methodology

Currently existing information on 'Threatened Flora and Fauna of the Locality', defined as a 10km x 10km area centred around the site, was accessed from the DPE Atlas of NSW Wildlife (May 2022), the Department of Agriculture, Water and Environment (DAWE) Environmental Reporting Tool (May 2022), and RoTAP (Briggs & Leigh, 1996) databases.

Other literature detailing regionally and locally threatened and significant flora, as well as endangered populations and plant communities of the study area, including NSW Scientific Committee Final Determinations (1996 - 2022) were accessed and reviewed.

Comprehensive surveys were undertaken on foot (Diversity Search method of Cropper 1993, and Threatened Biodiversity Surveys and Assessment - Guidelines for Developments and Activities - DEC 2004) to identify the existence of extant flora and extant fauna populations present on the subject area.

Assessment of fauna habitat features such as extent of hollows, presence of logs and other habitat features was undertaken.

The survey included an assessment of the presence, or likelihood of occurrence, of any threatened (endangered, vulnerable), rare (RoTAP) or regionally or locally significant species, or plant community, occurring on the site.

Threatened fauna species not recorded in the survey but with the potential to be present or to be occasional visitors as indicated by habitat were recorded.

The extent of noxious and other weed incursions on the subject area of the land were assessed.

## 1.8 Limitations of the study

Limitations of the study may arise where certain cryptic species of plants may occur as soil-stored seed or as subterranean vegetative structures. Some species are identifiable above-ground only after particular environmental circumstances related to factors such as periodic fire frequency, intensity or seasonality, soil moisture regime, grazing pressure, biological life-cycle patterns as in the case of small geophytic taxa such as species of orchids etc.

Diurnal surveys at one time of the year cannot be expected to detect the presence of all species occurring, or likely to occur, in the study area. This is because some species may (a) occur seasonally, (b) utilise different areas periodically (as a component of a more extensive home range), or (c) become dormant during specific periods of the year. Rather, the survey provides the opportunity to sample the area, search specifically for species likely to be encountered within the available time frame, and assess the suitability of habitat for particular species.

The criteria used to assess the likelihood of threatened species occurring in the Study Area included the specificity of habitat features such as tree canopy cover, relative soil moisture regime, relative soil nutrient regimes, extent of historical disturbance and degradation of vegetation and known occurrences of threatened species in the immediate locality.

If all or most of these collective criteria deemed optimal for the occurrence of a particular threatened species occur in relation to the habitat of the Study Area, then the likelihood of its potential occurrence in the habitat of the Study Area could be assessed as being relatively high. If only some of these collective criteria deemed suitable for the occurrence of a particular threatened species occur in the habitat of the Study Area, then its potential occurrence in the area of study may be deemed moderate at best. If few of these collective criteria deemed suitable for the occurrence of a particular threatened species occur in the habitat of the Study Area, then the likelihood of its occurrence would be assessed as being low to very unlikely.

# 2 EXISTING ENVIRONMENT

## 2.1 Topography, landscape, geology and soils

The topography of the subject site is a hill crest with exposed Hawkesbury Sandstone rock outcropping at the front of the property sloping down to a gently sloping rear section of the land where, lower down the slope, substrates derived from Narrabeen sediments are evident (Figures 5, 6 & 7).

The local substrate geology of the subject area at the upper sections of the land at 48 Lindley Avenue, Narrabeen, is Triassic Hawkesbury Sandstone Herbert 1983). This substrate is largely comprised of medium to coarse-grained quartz sandstone with very minor shale and laminite lenses (Herbert (1983). The soil landscape particular to the upper sections of the surveyed area is the most likely the erosional 'Gymea' Soil Landscape Series (Chapman & Murphy 1989). This soil landscape series is characterised by undulating to rolling low hills on Hawkesbury Sandstone. Gradients are generally <25% with rock outcropping <25%. Other features of this landscape are broad convex crests, gently to moderately inclined sideslopes with wide benches with localised rock outcropping on low broken scarps (Chapman & Murphy 1988).

Soil material formed from differential erosion and weathering of Hawkesbury Sandstone substrates include shallow to moderately deep yellow earths and earthy sands on crests and inside benches, whereas shallow siliceous sands and lithosols develop on leading erosional edges. Gleyed and yellow podsolics are associated with shale and siltstone lenses (Chapman and Murphy 1989).

## 2.2 Existing vegetation

The general remnant natural vegetation of the subject land on the upper sections of the property is representative of that which occurs on Hawkesbury Sandstone substrates, most likely described as 'Coastal Sandstone Foreshores Forest' (PCT 1778; OEH 2016 Code S_DSF06), whereas on the lower sections of the slope, the remnant forested community more likely established on Narrabeen sediments, may represent 'Coastal Flats Tall Moist Forest' (PCT 1915; OEH 2016 Code: S_WSF36).

However, few indigenous species occur at the subject site and those that occur, such as Port Jackson Fig and Cheese Tree (*Glochidion ferdinandi*), are positively diagnostic species in respect of both the above ecological communities (OEH 2016). Other native species occurring at, and in the vicinity of the subject site, include Sweet Pittosporum (*Pittosporum undulatum*), Cabbage Palm (*Livistona australis*), Illawarra Flame Tree (*Brachychiton acerifolius*), Black Bean (*Castanospermum australe*) and Giant Water Vine (*Cissus hypoglauca*) (the latter species growing above the property on Lindley Avenue).

Figure 5 indicates the cleared area of land at the rar of the current dwelling and the structural and floristic character of the vegetation along the sides of the rear of the subject land.

**Figure 5 -** Cleared rear yard with forested vegetation to 14m tall along sides of property, most trees lopped to gain views of the lagoon and other landscapes to the north

# 3 FLORA SURVEY AND ASSESSMENT

## 3.1 Methods

### 3.1.1 Literature review

Existing information on 'Threatened Flora of the Locality', defined as an area of 5km radius around the site, was accessed from the DPE Bionet Atlas of NSW Wildlife (online BioNet 2022), Commonwealth DAWE Environmental Reporting Tool (May 2022) and RoTAP (Briggs and Leigh 1996) databases. Other literature detailing regionally and locally threatened and significant flora, as well as endangered populations and plant communities of the study area, included NSW Scientific Committee Final Determinations (1996 - 2022).

### 3.1.2 Site survey

The survey included a floristic inventory of indigenous and exotic species and an assessment of the presence, or likelihood of occurrence, of any threatened, rare, regionally or locally significant species or plant community occurring at the surveyed site.

## 3.2 Results

### 3.2.1 Indigenous and exotic plant species

Appendix 1 lists the various plant species found to occur at the subject site. Species nomenclature follows that of Harden (1990 – 2002; 2022 online).

A total of 6 indigenous plant species, some occurring as single individuals, were recorded at the rear of the subject site. The most frequent tree species was Cheese Tree, with a total of 7 individuals occurring at the rear vegetated sections of the site as relatively mature trees (Figure 5).

A total of 7 exotic High Threat Weed (HTW) species (DPE 2022) were recorded at the rear of the surveyed area. The weed species include Mickey Mouse Plant (*Ochna serrulata*), Balloon Vine (*Cardiospermum grandiflorum*) and Fishpole Bamboo (*Phyllostachys aurea*) (Appendix 1).

The subject area contains a high extent of cleared ground surface, leaf litter and exposed rock (Figure 5).

### 3.2.2 Plant community

The relatively natural vegetated sections occurring at the rear of the property appear as a low forest to 14m tall with canopy cover to 40% (Figure 5). A non-native shrub canopy including such species as Shell Ginger, Wild Ginger etc occurring along the western rear side of the property to 2-3m tall has a cover of 20% (Figure 6). Cleared ground surface and leaf litter comprise up to 70% of the ground cover (Figures 5 & 6).

**Figure 6 -** Exotic species such as Shell Ginger comprise about 20% of the vegetative cover.

Vegetation mapping by DPE (2022) indicates no significant areas of native vegetation occurring at the subject site or surrounds (Figure 7)

The general remnant natural vegetation of the subject land on the upper sections of the property appears representative of that which occurs on Hawkesbury Sandstone substrates, most likely described as 'Coastal Sandstone Foreshores Forest' (OEH 2016 Code S_DSF06) (PCT 1778) whereas on the lower sections of the slope, the remnant forested community more likely established on Narrabeen sediments, may represent 'Coastal Flats Tall Moist Forest' (OEH 2016 Code: S_WSF36) (PCT 1915).

**‘Coastal Sandstone Foreshores Forest’**

Coastal Sandstone Foreshores Forest is found on sheltered sandstone slopes along the foreshores of Sydney’s major waterways and coastal escarpments. In its natural state, this community appears as an open forest with a moist shrub layer and a ground cover of ferns, rushes and grasses. The natural flora of this community has a maritime influence given its exposure to prevailing sea breezes. The natural canopy of this assemblage can be dominated by pure stands of smooth-barked apple (*Angophora costata)*, though more regularly this is found in combination with other tree species. Localised patches of bangalay (*Eucalyptus botryoides*), broad-leaved white mahogany (*Eucalyptus umbra*) and coast banksia (*Banksia integrifolia*) occur closest to the coast, whereas Sydney peppermint (*Eucalyptus piperita*) prefers more protected locations.

A prominent layer of hardy mesic small trees and shrubs is present. These include sweet pittosporum (*Pittosporum undulatum*), cheese tree (*Glochidion ferdinandi*) and blueberry ash (*Elaeocarpus reticulatus*).

This forest is restricted to sandstone soils derived from either Hawkesbury or Narrabeen geology. The distribution is coastal and requires a combination of low elevation (between two and 45 metres above sea level) and mean annual rainfall that exceeds 1100 millimetres per annum. It is noticeable that most sites are exposed to salt-laden winds. Samples are situated up to 10 kilometres from the coastline, but still in close proximity to major waterways.

The open-forest community at the small area of the subject site has been greatly modified with only Port Jackson Fig, Cheese Tree and Sweet Pittosporum indicative of floristic affiliation with this community.

This ecological community is represented in Sydney Harbour National Park, Royal National Park and Lane Cove National Park and is not listed as threatened on registers of the BC Act (2016) nor the Commonwealth EPBC Act (1999) (OEH 2016).

**'Coastal Flats Tall Moist Forest'**

Coastal Flats Tall Moist Forest in its natural condition, is a tall eucalypt community with layers of small rainforest trees and mesic shrubs found on coastal flats and adjoining toe slopes on Narrabeen Sandstone sediments (OEH 2016). Canopy species in its natural state include Bangalay, Sydney Blue Gum, Turpentine, Rough-barked Apple and Blackbutt. None of these species occur in the low forested vegetation (Figures 5 & 6).

Small mesic tree species include Cheese Tree, Port Jackson Fig, Sandpaper Fig, Cabbage Palm, Sweet Pittosporum and Lilly Pilly.

The open-forest community at the small area at the rear of the subject site has been modified with only Port Jackson Fig, Cheese Tree and Sweet Pittosporum indicative of floristic affiliation with this community.

This ecological community is represented in Royal National Park and Lane Cove National Park and is not listed as threatened on registers of the BC Act (2016) nor the Commonwealth EPBC Act (1999) (OEH 2016).


**Figure 7-** DPE (2022) mapping of ecological communities occurring at the subject site and in the neighbouring locality indicating no significant patches of native vegetation occurring at the subject land or immediate surrounds.

### 3.2.3 Impacts to vegetation resulting from proposed development and mitigation measures

**Trees proposed for removal**

The secondary dwelling footprint is only about 100m$^2$ (Figure 2). For the proposed location of the new secondary dwelling, only two individuals of naturally occurring native trees, one of Cheese Tree to 10m tall, and one of Illawarra Flame Tree to 9m tall, are proposed to be removed (Figure 3, Willis 2022).

An overmature individual of the ornamental species Liquidambar is proposed for removal as well as an individual of Hills Fig. Figure 3 indicates the location of these individuals in the subject area and in relation to the proposed secondary residence (Willis 2022).

**Mitigation measures to offset loss of trees**

Individuals of species such as Cheese Tree and Illawarra Flame tree, have been retained in relation to the proposal but losses can readily be replaced by planting in other landscaped areas in the lower section of the subject land.

**Mitigation measures to offset loss of fauna habitat**

Potential loss of sheltering and breeding habitat for birds or microchiropterans is negligible as most individuals of tree species such as Illawarra Flame Tree will be retained including 4 individuals of Cheese tree.

Landscaping with small native trees and shrubs representative of Coastal Enriched Sandstone Dry Forest and/or Coastal Enriched Sandstone Moist Forest (OEH 2016) would also provide food resources and sheltering opportunity.

### 3.2.4 Species of conservation significance

**Threatened species**

The DPE Bionet Atlas of NSW Wildlife (2022) records for an area of 5km radius around the subject site indicate that 17 species of conservation significance have been recorded within a radius of 5km of the site within the last 20 years (Table 1).

| Family | Common name | Scientific name | NSW status | Comm. status | No. of records |
|---|---|---|---|---|---|
| Dilleniaceae | | *Hibbertia superans* | E1 | | 1 |
| Elaeocarpaceae | | *Tetratheca glandulosa* | V | | 79 |
| Ericaceae | | *Epacris purpurascens var. purpurascens* | V | | 1 |
| Euphorbiaceae | Sand Spurge | *Chamaesyce psammogeton* | E1 | | 11 |
| Fabaceae (Mimosoideae) | Sunshine Wattle | *Acacia terminalis subsp. terminalis* | E1 | E | 12 |
| Lamiaceae | Villous Mint-bush | *Prostanthera densa* | V | V | 1 |
| | Seaforth Mintbush | *Prostanthera marifolia* | E4A,3 | CE | 1 |
| Malvaceae | | *Lasiopetalum joyceae* | V | V | 1 |
| Myrtaceae | Netted Bottle Brush | *Callistemon linearifolius* | V,3 | | 2 |
| | Camfield's Stringybark | *Eucalyptus camfieldii* | V | V | 46 |
| | | *Kunzea rupestris* | V | V | 1 |

| | | | | | |
|---|---|---|---|---|---|
| | Scrub Turpentine | *Rhodamnia rubescens* | E4A | | 13 |
| | Magenta Lilly Pilly | *Syzygium paniculatum* | E1 | V | 16 |
| **Orchidaceae** | Angus's Onion Orchid | *Microtis angusii* | E1,P,2 | E | 154 |
| **Proteaceae** | Caley's Grevillea | *Grevillea caleyi* | E4A,3 | CE | 173 |
| **Family** | **Common name** | **Scientific name** | **NSW status** | **Comm. status** | **No. of records** |
| **Proteaceae** | Hairy Geebung | *Persoonia hirsuta* | E1,P,3 | E | 12 |
| **Thymelaeaceae** | | *Pimelea curviflora var. curviflora* | V | V | 17 |

**Table 1 -** Bionet Atlas records (2022) of flora species recorded within a 10 x 10km area centred around the subject site within the previous 20 years

For most of these 17 species, the highly modified forested habitat of the subject site is unsuitable for their occurrence (Figures 5 & 6). Most threatened flora species recorded within a 10 x 10km area centred around the subject land occur further to the west in national parks and natural bushland areas occurring on sandstone substrates.

The nearest species recorded on the Bionet Atlas within the 10 x 10km area centred around the subject site is *Pimelea curviflora var. curviflora,* recorded some 1070m to the west of the site within bushland at Jamieson Park, Wheeler Heights (Figure 8). This species occurs on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes amongst woodlands. This woodland habitat with clay/lateritic soils does not occur at the forested sections of the subject site.

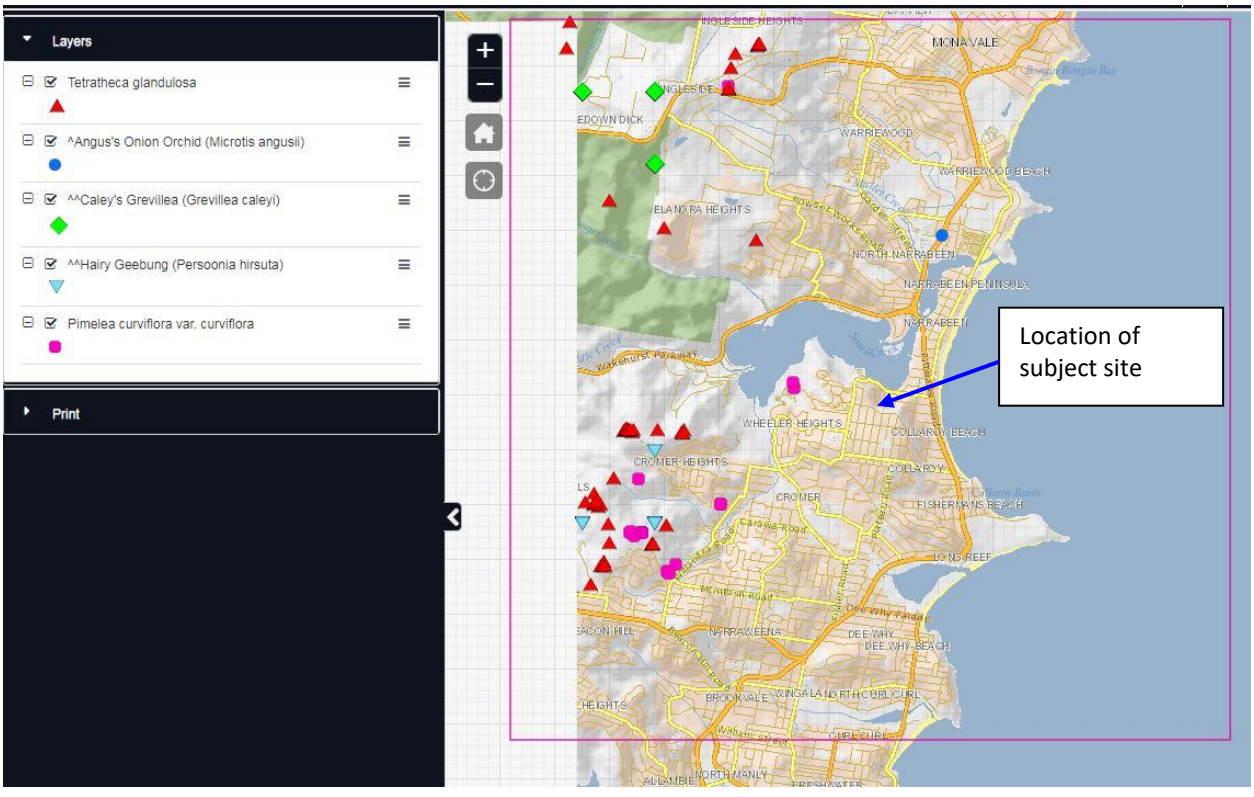

**Figure 8 -** Five species of threatened flora recorded within a 10 x 10km area centred around the subject site.

The ground cover is mostly cleared and the vegetated shrub and mid-stratum canopy cover is comprised of exotic weed and ornamental species (Figure 6).

However, the survey targeted the 17 species of conservation significance but none were found to occur in the surveyed area.

## 3.4 Conclusions of flora assessment

The proposal is to construct a secondary dwelling at the rear of the existing residence (Figure 2).

A total of 4 trees will require removal to accommodate the proposal (Willis 2022). These include 2 exotic species, an individual of Hills Fig and one of Liquidambar, and two individuals of indigenous species, one of Illawarra Flame Tree (*Brachychiton acerifolius*) to 9m tall and one of Cheese Tree (*Glochidion ferdinandi*) to 10m tall (Willis 2022). No significant habitat will be impacted by the removal of these 4 individuals.

The general remnant natural vegetation of the subject land on the upper sections of the property is most likely described as 'Coastal Sandstone Foreshores Forest' (OEH 2016 Code S_DSF06) (PCT 1778), whereas on the lower sections of the slope, the remnant forested community more likely established on Narrabeen sediments, may represent 'Coastal Flats Tall Moist Forest' (OEH 2016 Code: S_WSF36) (PCT 1915).

Both variants of the ecological communities occurring on the subject land are common on coastal sheltered hillslopes in the locality and region and neither is listed as threatened under the BC Act or the EPBC Act. No threatened plant species were found to occur in the subject land.

A total of 6 naturally-occurring indigenous plant species occurring at varying frequency was recorded within the rear of the subject property (Willis 2022).

A total of 8 exotic, High Threat Exotic (HTE) weed species (DPIE 2019) were recorded in the surveyed area. These weed species occurring at the subject site include Fishpole Bamboo, Balloon Vine and Mickey Mouse Plant (Appendix 1).

There is a relative connectivity of the natural bushland occurring within the residential locality with extensive bushland occurring at Jamieson Park to the west (Figures 4 & 8) and fragmented connectivity throughout the locality at Collaroy Plateau and Wheeler Heights (Figures 4 & 8).

The DPE Atlas of NSW Wildlife (2022) records for an area of 5km radius around the subject site indicate that 17 species of conservation significance have been recorded within a radius of 5km of the site within the last 20 years.

The habitat of the highly modified forested areas of the subject site is considered unsuitable for the occurrence of any of these species. The survey targeted all of these species of conservation significance but none were found to occur in the subject area.

# 4 FAUNA SURVEY AND HABITAT ASSESSMENT

The following fauna assessment has been prepared with particular regard to the Biodiversity Conservation Act 2016 (BC Act), Section 5A of the current Environmental Planning and Assessment Act (EP&A, 1979) and the Environment Protection and Biodiversity Conservation Act (EPBC Act, 1999).

## 4.1 Methods

### 4.1.1 Literature review

Searches were undertaken of the DPE Bionet Atlas of NSW Wildlife database 2022 (Dept Planning and Environment) for a 5km radius centred around the site, as well as the Commonwealth Department of Agriculture, Water and Environment (DAWE) 'Protected Matters Search Tool' Database (2022) for threatened species or populations of fauna likely to occur in the study area. Searches of JAMBA and CAMBA databases were also consulted in regard to the distribution of migratory bird species.

The following fauna assessment has been prepared with particular regard to the BC Act, Section 5A of the current EP&A Act and the EPBC Act.

Grid co-ordinates of centre of subject land; latitude: -33.720760$^{o}$ ; longitude: 151.289800$^{o}$

### 4.1.2 Site potential to form part of a fauna habitat corridor

There is a relative connectivity of the natural bushland occurring within the residential locality with extensive bushland occurring Jamieson Park to the west (Figure 4) and fragmented connectivity throughout the locality at Collaroy Plateau and Wheeler Heights (Figure 4).

The subject site has been mapped by WDCP (2011) as part of a Wildlife Corridor (Clause E4 of WDCP 2011) (Figure 9). Much of the natural canopy vegetation on the property occurs at the rear of the residence though the lower strata is comprised of ornamental species and woody weeds (Figure 6).

There is a mature planted individual of Tallow-wood to 28m tall with canopy spread of 28m and DBH of 1200mm at the front of the property, this individual affording significant habitat value for foraging, roosting and nesting opportunity for avifauna and foraging for arboreal mammals as well as bat species, including Grey-headed Flying Fox.

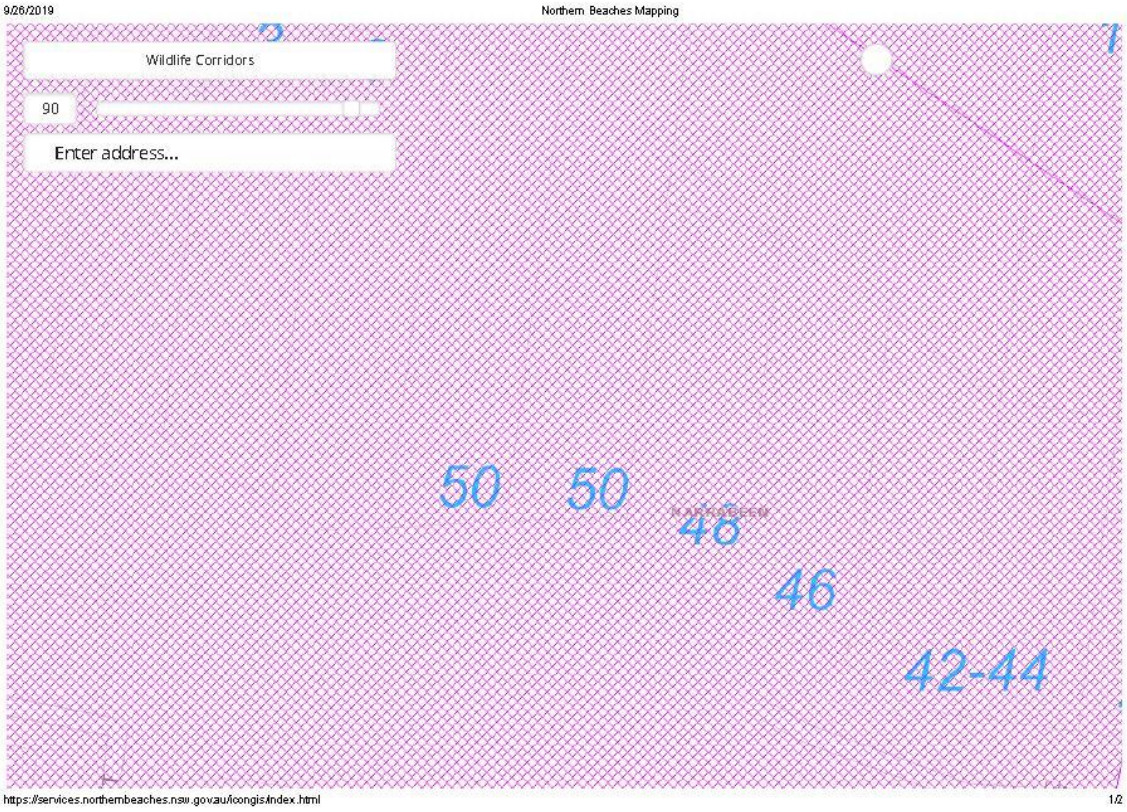


**Figure 9 -** The local area along Lindley Avenue, including No. 48 above, and surrounds has been mapped as Wildlife Corridor by WDCP (2011).

### 4.1.3 Site survey

The survey effort complies with the survey effort recommended by the Draft Guidelines for Threatened Species Assessment under Part 3A (DEC and DPI, 2005) for the study area size, habitat types available on the site and seasonal factors.

A dedicated ground search was undertaken as well as a census of extant birds. The survey involved different search strategies and protocols and all extant fauna or evidence of fauna was recorded.

**i) Fauna survey weather conditions**

The subject land at 48 Lindley Avenue, Narrabeen, was surveyed on the 6th April 2022 for fauna and fauna habitat.

Weather conditions 6th April 2022:
6/04/2022 - 9am: temp 17.6°C; Wind SSW 17km/hr
3pm: temp 17.7°C; Wind ESE 15
rainfall 2mm;
Relative Humidity 100%
Source: Terrey Hills (AWS no. 066059).

**ii) Recording Methods**

- The search strategy employed for diurnal birds is based on utilising periodic observation stations or "point counts" as described by York et al., (1991). Counts were conducted only during periods of relatively high activity (morning). Searches undertaken included recording and observing location of potential roost sites and accessible tree hollows. Roost trees are delineated by evidence of white wash around the base of a tree or tree trunk.

- Scat searches and pellet analysis were conducted to ascertain the species present.

- Opportunistic hand searches for reptilian fauna were undertaken during the morning but rainfall was steady and not opportune for locating reptiles

- Potential habitats for microchiropteran species at the subject site would include hollows and spouts, usually found in dead timber if occurring on existing trees at the site.

## 4.2 Results

### 4.2.1 Fauna habitats occurring on the subject land

**Front Yard**

The small area of the front yard is largely landscaped and contains a large mature individual of Tallow-wood, with other ornamental trees and shrubs as well as a few native small tree species.

Fruit of the flowering eucalypt could occasionally attract the Grey-headed Flying Fox and other arboreal mammalian species, such as Ring-tail and Brushtail Possums. No branches were observed that contained dead limbs (spouts) with small hollows that may be suitable for some microchiropteran species and small avifauna and there are no large hollows to accommodate large arboreal mammals or large owls.

**Rear Yard**

The relatively natural vegetated sections occurring at the rear of the property appear as a low forest to 14m tall with canopy cover to 40% (Figure 5). A non-native shrub canopy including such species as Shell Ginger, Wild Ginger etc to 2-3m tall has a cover of 20% (Figure 6). Cleared ground surface and leaf litter comprise up to 70% of the ground cover (Figures 5 & 6).

The low forest vegetation provides foraging and sheltering habitat for fauna and provides connectivity for faunal movement between and within surrounding fragmented bushland.

Sections of exposed sandstone rock provide basking opportunity for local individuals of Water Dragon (*Physignathus leseurii*).

Areas of leaf litter build-up may provide nesting opportunity for the Australian Brushturkey (*Alectura lathami*).

### 4.2.2 Fauna recorded

The weather conditions at the time of survey were wet conditions and cool temperatures in Autumn with few flowering plants in the vicinity, and as such, not ideal conditions for bird activity.

The most commonly recorded bird species utilising resources in the forested area of the subject land and surrounds were the Noisy Miner (*Manorina melanophris*), Little Wattlebird (*Anthochaera chrysoptera*) and Rainbow Lorikeet (*Trichoglossus haematodus*). These bird species are aggressive nectar-feeding species which may exclude other nectar-feeding birds from flowering trees and shrubs in the area.

Parrots such as Sulphur-crested Cockatoo (*Cacatua galerita*) and Rainbow Lorikeet (*Trichoglossus haematodus)* compete with other birds for scarce nesting opportunities in tree hollows of the locality.

Common bird species including the Australian Raven (*Corvus coronoides*), Grey Butcherbird (*Cracticus torquatus*), Crimson Rosella (*Platycercus elegans*), Superb Fairy Wren (*Malurus cyaneus*) and Laughing Kookaburra (*Dacelo novaeguineae*) would be expected to occur occasionally.

Nocturnal birds expected to forage in the area include the Tawny Frogmouth (*Podargus strigoides*) and Southern Boobook (*Ninox boobook*). The Powerful Owl (*Ninox strenua*) may also be expected to forage in the area due to the potential presence of prey species and past recordings of the species in the vicinity.

The large megabat, Grey-headed Flying Fox (*Pteropus poliocephalus*) was not sighted during this survey but may be attracted to the general area by flowering eucalyptus trees and fruiting figs in the summer months.

One species of reptile was recorded, the Dark flecked Garden Skink (*Lampropholis delicata*) was observed common within leaf litter.

The Eastern Water Skink (*Eulamprus quoyii*) and The Eastern Blue-tongue Lizard (*Tiliqua*

*scincoides*) would also be expected to occur on the site occasionally.

All fauna species recorded in the current survey and from anecdotal evidence are listed in Appendix 2.

### 4.2.3 Fauna species of conservation significance

#### 4.2.3.1 Threatened species

The Bionet Atlas of NSW Wildlife database 2022 (Dept Planning and Environment) listed thirty seven (38) species (omitting all unlikely animals such as Whales, Penguins, Seals and migratory shorebirds) of terrestrial and avifauna listed as threatened under the BC Act within a 5 km radius centred around the subject site (Table 2).

Four of these species are designated as endangered by the NSW Scientific Committee with the remainder species designated as vulnerable to extinction. Under the EPBC Act 1999, two of these species are listed as critically endangered, four as endangered and five as vulnerable (Table 3).

| Family | Common name | Scientific name | NSW status | Comm. status | No. of records |
|---|---|---|---|---|---|
| **Amphibia**<br>Myobatrachidae | Red-crowned Toadlet | *Pseudophryne australis* | V,P | | 105 |
| Limnodynastidae | Giant Burrowing Frog | *Heleioporus australiacus* | V,P | V | 30 |
| **Reptilia**<br>Varanidae | Rosenberg's Goanna | *Varanus rosenbergi* | V,P | | 66 |
| **Aves**<br>Columbidae | Rose-crowned Fruit-Dove | *Ptilinopus regina* | V,P | | 2 |
| | Superb Fruit-Dove | *Ptilinopus superbus* | V,P | | 2 |
| Apodidae | White-throated Needletail | *Hirundapus caudacutus* | P | V,C,J,K | 11 |
| | Black Bittern | *Ixobrychus flavicollis* | V,P | | 19 |
| Accipitridae | White-bellied Sea-Eagle | *Haliaeetus leucogaster* | V,P | | 29 |
| | Little Eagle | *Hieraaetus morphnoides* | V,P | | 6 |
| | Square-tailed Kite | *^^Lophoictinia isura* | V,P,3 | | 3 |
| Burhinidae | Bush Stone-curlew | *Burhinus grallarius* | E1,P | | 7 |
| Cacatuidae | Gang-gang Cockatoo | *^^Callocephalon fimbriatum* | V,P,3 | E | 2 |
| | Glossy Black-Cockatoo | *^Calyptorhynchus lathami* | V,P,2 | | 68 |
| Psittacidae | Little Lorikeet | *Glossopsitta pusilla* | V,P | | 8 |
| | Swift Parrot | *^^Lathamus discolor* | E1,P,3 | CE | 16 |
| | Turquoise Parrot | *^^Neophema pulchella* | V,P,3 | | 1 |
| Strigidae | Barking Owl | *^^Ninox connivens* | V,P,3 | | 20 |
| | Powerful Owl | *^^Ninox strenua* | V,P,3 | | 228 |
| Tytonidae | Sooty Owl | *^^Tyto tenebricosa* | V,P,3 | | 1 |
| Meliphagidae | Regent Honeyeater | *Anthochaera phrygia* | E4A,P | CE | 3 |
| Neosittidae | Varied Sittella | *Daphoenositta chrysoptera* | V,P | | 5 |

| Family | Common name | Scientific name | NSW status | Comm. status | No. of records |
|---|---|---|---|---|---|
| Petroicidae | Scarlet Robin | *Petroica boodang* | V,P | | 2 |
| **Mammalia** Dasyuridae | Spotted-tailed Quoll | *Dasyurus maculatus* | V,P | E | 5 |
| Peramelidae | Southern Brown Bandicoot (eastern) | *Isoodon obesulus obesulus* | E1,P | E | 7 |
| Phascolarctidae | Koala | *Phascolarctos cinereus* | V,P | E | 2 |
| Burramyidae | Eastern Pygmy-possum | *Cercartetus nanus* | V,P | | 442 |
| Petauridae | Squirrel Glider | *Petaurus norfolcensis* | V,P | | 2 |
| Pteropodidae | Grey-headed Flying-fox | *Pteropus poliocephalus* | V,P | V | 172 |
| Emballonuridae | Yellow-bellied Sheathtail-bat | *Saccolaimus flaviventris* | V,P | | 2 |
| Molossidae | Eastern Coastal Free-tailed Bat | *Micronomus norfolkensis* | V,P | | 18 |
| Vespertilionidae | Large-eared Pied Bat | *Chalinolobus dwyeri* | V,P | V | 14 |
| | Eastern False Pipistrelle | *Falsistrellus tasmaniensis* | V,P | | 1 |
| | Southern Myotis | *Myotis macropus* | V,P | | 46 |
| | Greater Broad-nosed Bat | *Scoteanax rueppellii* | V,P | | 4 |
| | Eastern Cave Bat | *Vespadelus troughtoni* | V,P | | 1 |
| Miniopteridae | Little Bent-winged Bat | *Miniopterus australis* | V,P | | 55 |
| | Large Bent-winged Bat | *Miniopterus orianae oceanensis* | V,P | | 165 |
| Muridae | New Holland Mouse | *Pseudomys novaehollandiae* | P | V | 1 |

**Key**

Environmental Protection and Biodiversity Conservation Act (EPBC Act) 1999

CE - Critically Endangered
E - Endangered
V - Vulnerable
P - Protected

Biodiversity Conservation Act (BC Act) 2016

E1 - Endangered
E2 - endangered population
E4 - critically endangered
V - Vulnerable

J JAMBA Migratory bird agreement between Australia and Japan
C CAMBA Migratory bird agreement between Australia and China

**Legend to Table 2 -** BC Act, EPBC Act, Migratory Bird Agreements

**Table 2-** 38 species of threatened fauna that have been recorded within a 5km radius centred around the subject site within the previous 20 years (DPE Bionet Atlas 2022).

Those species with potential to occur are listed below:

#### 4.2.3.2 Threatened species with potential to occur on the subject land (assessed by potential habitat presence and recorded sightings in DPE 2022)

It is considered that threatened species with the occasional potential to utilise resources on the subject land and surrounding areas could include the Large Bentwing-Bat (*Miniopterus orianae oceanensis*), a microbat frequently recorded over a wide range of forested habitats in the region (pers obs)., Grey-headed Flying Fox (*Pteropus poliocephalus*) and Powerful Owl (*Ninox strenua*).

**1. Large Bentwing Bat (*Miniopterus orianae oceanensis*)**

Roosting habitat for this species includes caves, mines near or above water, discarded buildings and tunnels. No suitable structures described are present on the subject land. Suitable roosting habitat for this threatened microchiropteran bat species is likely to be found within moister valleys of the locality.

This bat forages in well timbered valleys above the tree canopy on small flying insects (Strahan 1995). Potential occasional foraging habitat is present over the land and within the immediate vicinity but is possibly reduced by traffic noise. Core likely foraging habitat for the Large Bentwing Bat is more likely concentrated in the larger areas of more mature vegetation within Jamieson Park.

Due to the lack of suitable roosting habitat, and urbanised location, this area is considered to be of relatively low value for foraging when compared to larger areas of vegetation in surrounding reserves. No significant adverse impact on the life-cycle or population dynamics of the Large Bentwing Bat is expected from the proposed development.

Figure 10 indicates the wide range of localities in the vicinity in which this species has been recorded in the previous 20 years.

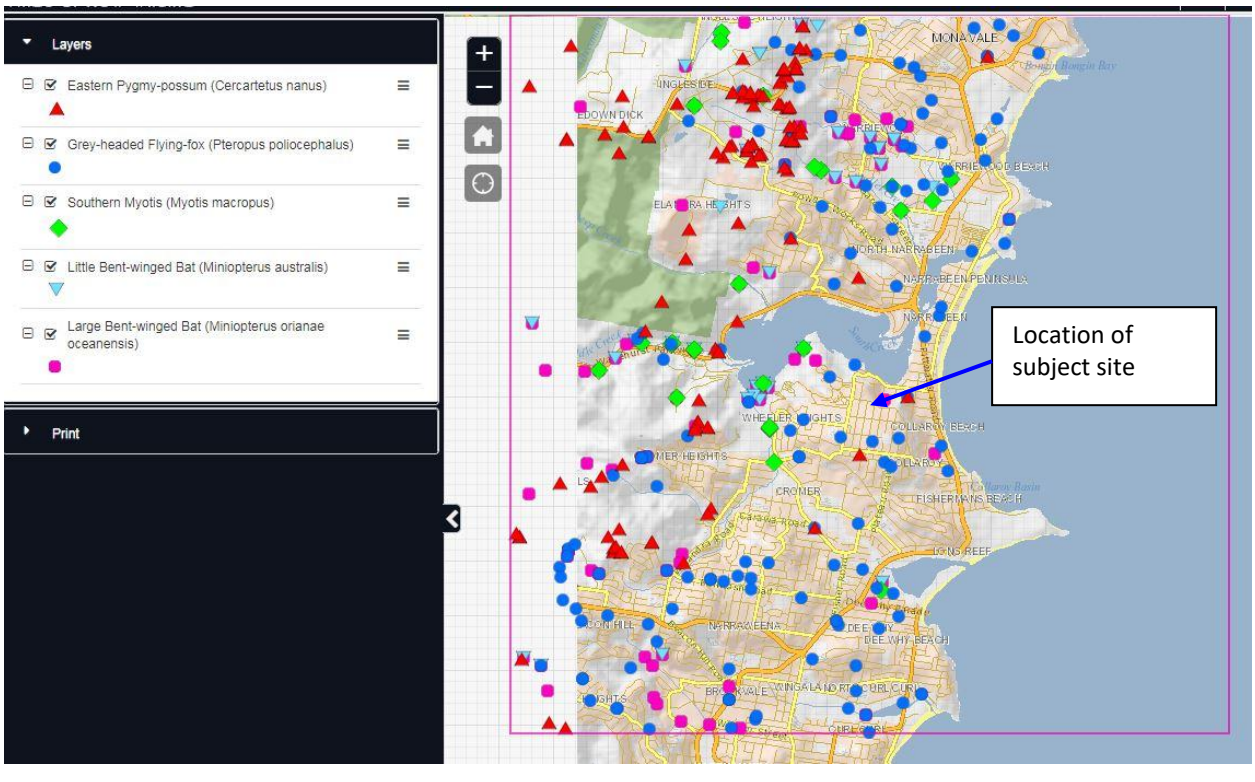


**Figure 10 -** Recorded locations of Large and Little Bent-wing Bat species, Southern Myotis, Grey-headed Flying Fox and Pygmy Possum within a 10km area centred around the subject site

## 2. Grey-headed Flying Fox (*Pteropus poliocephalus*)

The Grey-headed Flying-fox while not recorded during this current survey may use resources on site may be an infrequent visitor to the general area based upon database records.

Figure 11 indicates the wide range of localities in which this species has been recorded in the previous 20 years.

Limited foraging habitat for this species is considered to be present in the study area when food resources are present in the form of nectar-producing trees. No camp sites are present within or in the bushland adjacent to the subject land. Any limited vegetation clearing as a result of the development would not result in a significant reduction in available foraging habitat in the short-term and is not considered likely to prevent the species from utilising bushland to the west and fragmented bushland areas surrounding the site for foraging in the medium to long term.

## 3. Powerful Owl (*Ninox strenua*)

The Powerful Owl requires large tracts of forest or woodland habitat but can also occur in fragmented landscapes (DEC, 2006). This species is known to nest in large tree hollows (at least 0.5 m deep), in large eucalypts that are at least 150 years old (DEC 2006) and some of their prey also rely on tree hollows for refuge. No hollows of sufficient size to accommodate the Powerful

Owl were observed in any of the trees on the subject land. The majority of the trees have no hollows or fissures that could accommodate the Powerful Owl's prey species such as the Common Ringtail Possum. The Powerful Owl will move into areas where prey species are abundant and move on to another area once prey numbers are depleted (DEC 2006).

Figure 11 indicates the wide area of localities in which the species has been recorded within the last 20 years and it is considered that a significant adverse impact by the proposed development on the Powerful Owl is highly unlikely.

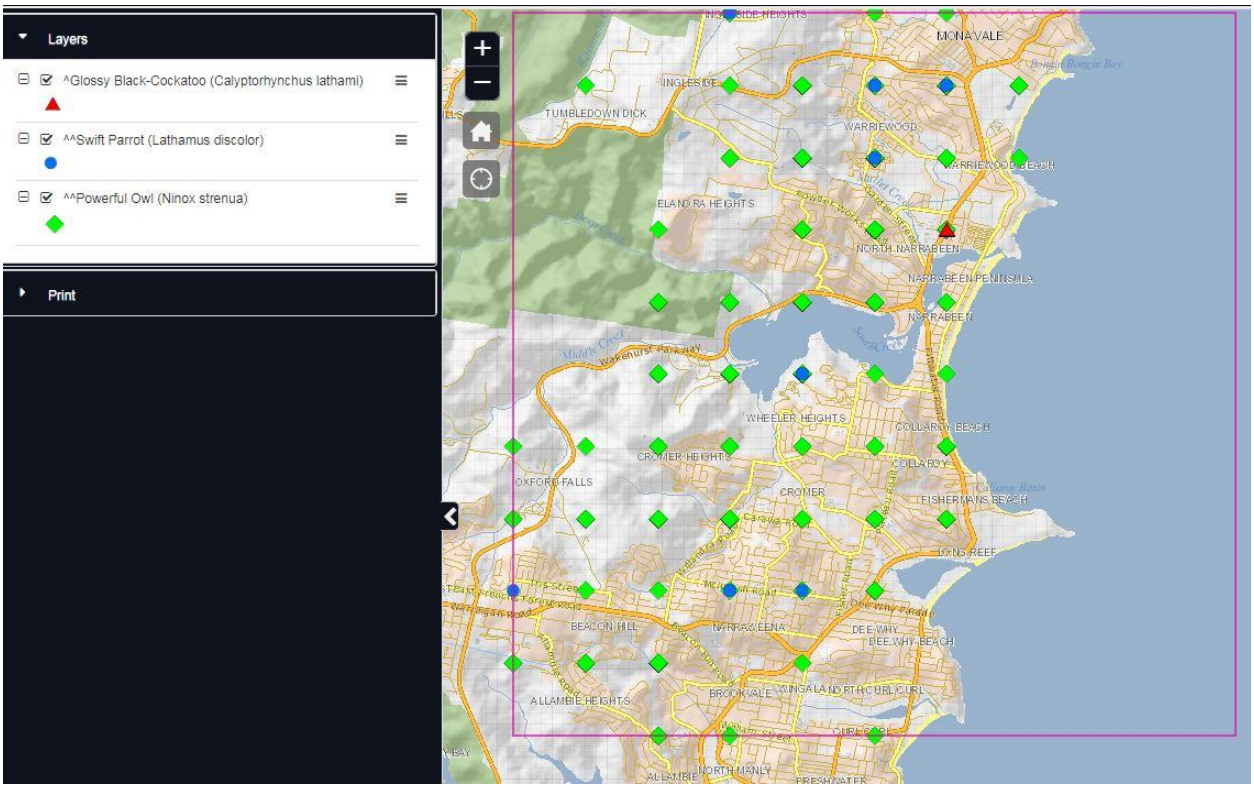


**Figure 11 -** Recorded locations of Powerful Owl along a 1km grid pattern within a 10km area centred around the subject site

Based on assessments of potential habitat loss within the small area of the subject site for the species listed above, the development is not considered to have a significant adverse affect on the life-cycle or potential viability of populations of any of these threatened species in the locality.

#### 4.2.3.3 Species listed by the Commonwealth DAWE (Commonwealth Protected Matters Search Tool) as potential inhabitants of the site.

Each of the threatened species listed by DAWE (Canberra) was reviewed in relation to the distribution, habitat and likelihood of occurrence. For those species with potential to occur, an assessment of habitat potential is addressed. One threatened species with a occasional

likelihood of using these resources is the Grey-headed Flying Fox (*Pteropus poliocephalus*). As detailed previously, the development is not considered to impose a significant adverse affect on the foraging ability of this threatened species.

#### 4.2.3.4 Species listed by the Commonwealth DAWE (Commonwealth Protected Matters Search Tool) as potential migratory inhabitants of the site.

The White-bellied Sea-eagle is considered to be a migratory species (C - CAMBA Migratory bird agreement between Australia and China, listed by DAWE (Canberra) (Table 2) and recorded locations were reviewed in relation to the distribution, habitat and likelihood of occurrence. The White-bellied Sea-eagle was recorded mainly around the coastal zones within a 10km area centred around the subject site and is considered highly unlikely to rely on the affected area as breeding, foraging or roosting habitat due to unsuitable urbanised habitat and the level of disturbance adjacent to busy roads.

Breeding habitat is more likely to be located in core bushland areas beyond the study area surrounding Narrabeen Lagoon.

## 4.3 Conclusions of fauna assessment

As part of the biodiversity impact assessment, a fauna survey was undertaken to record fauna species currently utilising the site and to assess the habitat value for threatened and migratory species listed in the database for the area. The potential habitat occurring at the subject land is rated as relatively poor due to the lopped crowns of individuals of trees forming the low forest stratification in the rear of the land, with woody weeds common in the lower strata, which may however, offer shelter or foraging resources for avian or ground-dwelling fauna.

To the west of the subject land at Jamieson Park (Figure 4), the fauna habitat value is rated as good as the vegetation structure is more integrated and floristics appear to have greater diversity.

Recorded species utilising the subject land are common to the area. Whilst few bird species were recorded on the subject land, this was mainly due to the survey undertaken in the cooler, wetter months of Autumn and the subsequent lack of flowering at the time.

The presence of feral animals, such as the Cat, which would be expected to occur occasionally at the subject land, could potentially also reduce the terrestrial fauna diversity within the subject land.

Database searches at a Local Government, State and Federal level were undertaken to identify threatened species that had been recorded previously in the area.

Threatened species identified as having occasional potential to occur on the site were

examined to assess any possible impact from the proposed development. These included the Powerful Owl, Large Bentwing Bat and the Grey-headed Flying Fox.

The Large Bentwing Bat forages in well timbered valleys above the tree canopy on small flying insects (Strahan 1995). Potential occasional foraging habitat may be present over the land and within the immediate vicinity, particularly when trees are in flower and attracting insects. Core likely foraging habitat for the Large Bentwing Bat is more likely concentrated in larger areas of more mature vegetation occurring within Jamieson Park.

Assessment of habitat in the woodland concluded that the Powerful Owl (*Ninox strenua*) may occasionally forage within the area if suitable prey species were in abundance and also for the Grey-headed Flying Fox when particular tree species were fruiting or flowering.

It is considered that for each of the threatened fauna species that may occasionally forage at the small area of subject land, the development would be unlikely to have an adverse effect on the life cycle of the individual species or impact significantly on the area of their respective habitat.

As such it is considered that further assessment in the form of Biodiversity Offset Scheme entry requirements or preparation of a Species Impact Statement is not necessary.

For any areas of bushland within the site that is not proposed for development, it is recommended that there be no removal of fauna habitat features such as bush rock outcrops, organic debris, branches or logs which provide refuge for native species.

Removal of woody weeds from the rear section of the subject land , many classed as HTW weeds (Appendix 1) is also recommended, with replacement planting with native shrubs and ground cover plants that are characteristic of 'Coastal Sandstone Foreshores Forest' (OEH 2016 Code S_DSF06) (PCT 1778) and 'Coastal Flats Tall Moist Forest' (OEH 2016 Code: S_WSF36) (PCT 1915).

### 4.3.1 Mitigation measures for Key Threatening Processes (KTP) proposed to maintain biodiversity and species of conservation significance

- Feral cat predatory behaviour is a KTP. It is recommended that no cats be kept or fed on the premises.
- Landscape planting with native plants endemic to the area will reduce any potential populations of Black Rat.
- Retain rock outcrops where not subject to construction, retain any dead trees and woody debris where possible to provide habitat for invertebrates, reptiles, amphibians, birds and small mammals.

# 5 ADDRESSING THE PROPOSED DEVELOPMENT IN RELATION TO THE BAM (BIODIVERSITY ASSESSMENT METHOD) AS REQUIRED BY THE BC ACT (2016) AND WARRINGAH DCP 2011

## 5.1 Offset Scheme Thresholds

### 5.1.1 Area criteria

The threshold for clearing above which the BAM and offsets apply is 0.25ha (BAM 2016). If the area to be developed is >0.25ha then offsets apply (BAM 2016).

The development includes a small area of cleared land of area less than 100m$^2$ and does not meet the offset criteria in relation to area to potentially be impacted.

### 5.1.2 Biodiversity Values Map

The Biodiversity Values Map (BV Map) identifies land with high biodiversity value, as defined by the *Biodiversity Conservation Regulation 2017*. The Biodiversity Offsets Scheme applies to all local developments, major projects or the clearing of native vegetation where the *State* Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 applies. Any of these will require entry into the Biodiversity Offsets Scheme if they occur on land mapped on the Biodiversity Values Map (OEH 2018).

The location of the subject property on the Biodiversity Values Map is indicated in Figure 12.

The subject property is not indicated as containing any significant Biodiversity Value (Figure 12).

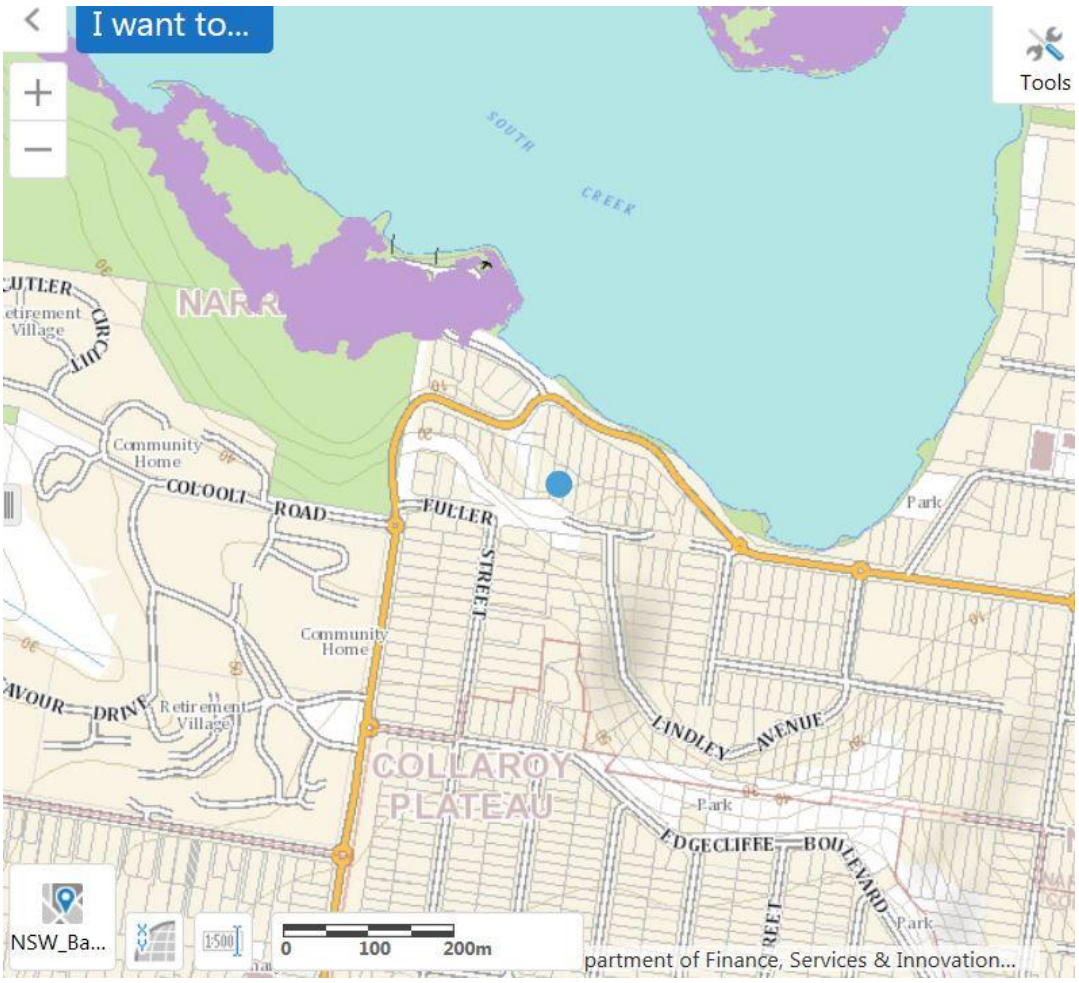


**Figure 12 -** Biodiversity Values Mapping of subject site at 48 Lindley Avenue, Narrabeen (blue solid circle on map), showing no biodiversity values mapped for the subject land (biodiversity values are indicated in purple shading if present) (Dept Finance, Services and Innovation 2022).

### 5.1.3 Threatened species, populations and/or ecological communities.

The assessment of the likelihood of potential impact of the proposed development of the small area of forested woodland to any threatened species of flora and/or fauna and /or ecological communities is detailed in Sections 3.2.2, 3.2.3 and 4.2.3 of this report.

It is concluded that no threatened flora or fauna species or ecological community is likely to be significantly impacted by the development to remove four trees in the construction proposed for the small area of land that occurs amongst long-established residential development in the locality.

As such, this development based on threatened species occurrence and potential impacts of development is not considered to trigger the offsets scheme.

## 5.2 Matters for consideration in regard to WDCP 2011

Northern Beaches Council as part of their legislative responsibility must consider the following in respect of the Warringah Council Local Environmental Plan (WLEP 2000); Warringah Council Local Environment Plan 2011 (WLEP 2011) and Warringah Development Control Plan (WDCP 2011).

WDCP (2011) includes the following clauses that must be addressed:

- **E1 - Preservation of Trees or Bushland Vegetation**

  **Comment:** Only two individuals of native trees (Cheese Tree and Illawarra Flame Tree) (Tree Nos. 3 & 5 in Willis 2022) in the rear yard of the existing residence is to be removed to accommodate the proposed construction of the secondary dwelling (Figures 2, 5 & 6). These trees contain no hollows suitable for fauna habitation.

  It is recommended to replace these tree with replacement saplings of the same species to preserve the native tree component in the rear garden. Similar sized trees occur in the rear garden vegetation and will be retained (Willis 2022).

- **E4 - Wildlife Corridors**

  **Comment:** The property has been mapped as occurring within a wildlife corridor (Figure 10). Bushland preserved in the front yard (primarily the mature individual of Tallow-wood) and most of the components of Cheese Tree and other native small tree species occurring in the rear yard contribute to the continuity of the wildlife corridor.

  The removal of two individuals of indigenous tree species and their replacement with the same species is considered sufficient to maintain the potential wildlife corridor. Removal of woody weeds and other exotic vegetation and replacement with native species characteristic in the area, would improve the integrity and natural condition of the corridor.

- **E6 - Retaining unique environmental features**

  **Comment:** No surface rock is required to be excavated to accommodate the proposal (Figures 5 & 6), and it is considered that the rear yard would retain much of the current environmental features at the subject land.

- **E2 - Prescribed Vegetation**

  1. The following is prescribed for the purposes of clause 5.9 (2) of Part 2 of the Vegetation SEPP:

  All native vegetation identified on:
  a) DCP Map Threatened and High Conservation Habitat
  b) DCP Map Wildlife Corridors

c) DCP Map Native Vegetation
d) known or potential habitat for threatened species, populations or ecological communities as listed under the NSW *Biodiversity Conservation Act 2016* and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

2. Development is to be situated and designed to minimise the impact on prescribed vegetation, including remnant canopy trees, understorey vegetation, and ground cover species

The DCP mapping of the lower section of the property includes an area mapped as Native Vegetation (Figure 13) corresponding to the equivalent mapping of the this area as 'High Conservation Habitat' (Figure 14) (likely in association with the local area of Lindley Avenue, Narrabeen, mapped as 'Wildlife Corridor' in Figure 9).

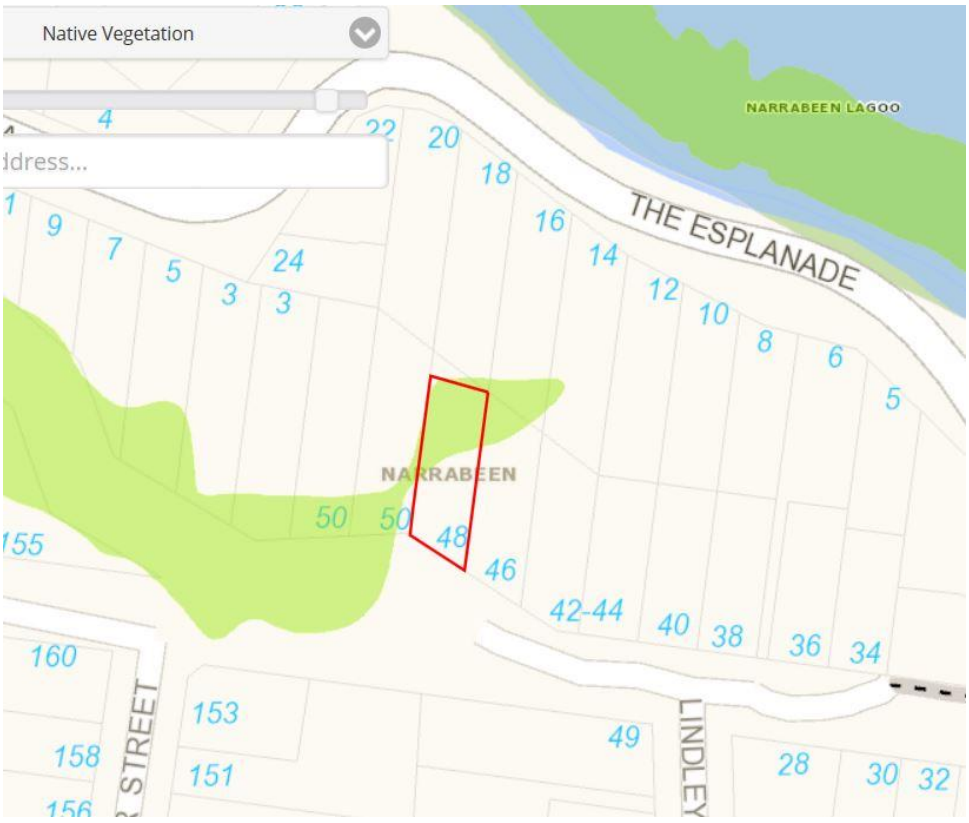


**Figure 13 -** Lower section of vegetated property mapped as containing native vegetation


**Figure 14 -** Lower section of vegetated property mapped as containing 'High Conservation Habitat'

**Comment:** The vegetation occurring at the lower rear section of the subject land includes up to 12 indigenous canopy trees to 12m tall, including 5 individuals of Cheese Tree (Figure 5). The crowns have been lopped (Figure 5) and the understorey is comprised of woody weeds and ornamental species with no native species occurring in the sub-canopy or ground layers of the vegetation (Figure 6).

Within this section of the subject land, only two native trees would be removed, an individual of Illawarra Flame Tree and one of Cheese Tree (Willis 2022). These individuals can be replaced and, as such, this 'prescribed' vegetation would be preserved. It is recommended, however, that the distribution of HTW weeds such as invasive species such as Wandering Jew, Balloon Vine, Mickey Mouse Plant and Fishpole Bamboo (Appendix 1) be removed and replaced with native species commensurate with former assemblages occurring at the locality.

- **E3 - Threatened species or ecological communities listed under State or Commonwealth legislation**

  **Comment:** No threatened species of flora or fauna were observed at the subject land and none would likely be impacted by the proposal. Threatened fauna species with potential to occasionally forage at or in the vicinity of the subject land based on potential foraging habitat and recent Bionet records (DPE 2022) may include Grey-headed Flying Fox, Large Bentwing Bat and Powerful Owl when seasonal or other food resources are available. None of the species

would be impacted by the proposal such that their life cycles would be compromised.

- **E5 - Native Vegetation**

  **Comment:** Within the rear section of the subject land, only two native trees would be removed to facilitate the construction of the secondary dwelling, an individual of Illawarra Flame Tree and one of Cheese Tree (Willis 2022). These species are common to the locality with seeds dispersed by birds and bats such that a wide range of distribution and regenerative potential exists.

  It is recommended to replace these individuals with replacement saplings of the same species to preserve the native tree component in the rear garden. Similar sized trees currently occur in the rear garden vegetation.

  As such, it is considered that the extent of native vegetation at the subject land would not be significantly compromised as a result of the proposed development.

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**Appendix 1: Floristic species assemblage recorded in rear yard at 48 Lindley Avenue, Narrabeen**

**KEY**

**Status**

pl - planted individuals of either non-locally native or exotic ornamental flora
* Exotic species
HTW - High Threat Weeds (DPE 2022)

**Vegetation**
Elements of 'Coastal Sandstone Foreshores Forest' PCT 1778 (OEH 2016) & 'Coastal Flats Moist Tall Forest' PCT 1915 (OEH 2016). Tree nos. per Willis (2022)

**Relative cover percentage of occurrence**

| STATUS | SCIENTIFIC NAME | COMMON NAME | DOWNSLOPE REAR YARD SECTION |
|---|---|---|---|
| | **FILICOPSIDA** | | |
| | **Aspleniaceae** | | |
| | *Asplenium australasicum* | Birds Nest Fern | 1 plant at ground level |
| | **Davalliaceae** | | |
| * | *Nephrolepis cordifolia* | Fishbone Fern | 1% |
| | **MAGNOLIOPSIDA: MAGNOLIDAE** | | |
| | **Anarcardiaceae** | | |
| *pl | *Mangifera indica* | Mango | 0.5% |
| | **Altingiaceae** | | |
| *pl | *Liquidambar styraciflua* | American Sweet Gum | 1 tree (no. 1) |
| | **Apocynaceae** | | |
| * | *Nerium oleander* | Oleander | 1% |
| | **Asteraceae** | | |
| HTW | *Bidens pilosa* | Cobblers Pegs | 2% |
| * | *Sonchus oleraceus* | Common Sowthistle | 0.5% |
| * | *Conyza sumatrensis* | Tall Fleabane | 2% |

| STATUS | SCIENTIFIC NAME | COMMON NAME | DOWNSLOPE REAR YARD SECTION |
|---|---|---|---|
| | **Bignoniaceae** | | |
| * | *Tecoma capensis* | Cape Honeysuckle | 3% |
| | **Caesalpinaceae** | | |
| HTW | *Senna pendula* var. *glabrata* | Common Cassia | 1 small tree |
| | **Fabaceae** | | |
| | *Castanospermum australe* | Black Bean | 1 tree (tree no. 15) |
| | **Malvaceae** | | |
| | *Brachychiton acerifolius* | Illawarra Flame Tree | 4 trees (tree nos. 3, 9, 10 & 13) |
| *pl | *Hibiscus rosa-sinensis* | Hibiscus | 1 shrub |
| | **Moraceae** | | |
| | *Ficus rubiginosa* | Port Jackson Fig | 1 tree (no. 2) |
| * | *Ficus microcarpa* | Hills Fig | 1 tree (tree no. 6) |
| * | *Morus alba* | White Mulberry | 5% |
| | **Myrtaceae** | | |
| pl | *Melaleuca decora* | | 1 small shrub |
| | **Ochnaceae** | | |
| HTW | *Ochna serrulata* | Mickey Mouse Plant | 5% |
| | **Phyllanthaceae** | | |
| | *Glochidion ferdinandi* | Cheese Tree | 5 trees (tree nos. 6, 7, 8, 11, 12) |
| | **Pittosporaceae** | | |
| | *Pittosporum undulatum* | Sweet Pittosporum | dead tree (tree no. 4) |
| | **Proteaceae** | | |
| pl | *Stenocarpus sinuatus* | Fire-wheel Tree | 1 tree (tree no. 14) |
| | **Sapindaceae** | | |
| HTW | *Cardiospermum grandiflorum* | Balloon Vine | 5% |

| STATUS | SCIENTIFIC NAME | COMMON NAME | DOWNSLOPE REAR YARD SECTION |
|---|---|---|---|
| | **MAGNOLOPSIDA: LILIDAE** | | |
| | **Arecaceae** | | |
| * | *Howea forsteriana* | Kentia Palm | 1% |
| | **Commelinaceae** | | |
| HTW | *Tradescantia fluminensis* | Wandering Jew | 5% |
| | **Iridaceae** | | |
| * | *Agapanthus praecox* | Agapanthus | 1% |
| | **Poaceae** | | |
| HTW | *Ehrharta erecta* | African Veldt Grass | 2% |
| HTW | *Phyllostachys aurea* | Fishpole Bamboo | 0.5% |
| | **Zingiberaceae** | | |
| * | *Alpinia zerumbet* | Shell Ginger | 10% |
| * | *Hedychium gardneranum* | Wild Ginger | 0.5% |

## Appendix 2: Fauna species observed and/or expected to occur within the surveyed area at 48 Lindley Avenue, Narrabeen

| FAMILY | SCIENTIFIC NAME | COMMON NAME | 10/2019 & 6/04/2022 |
|---|---|---|---|
| **BIRDS** | | | |
| Alcedinidae | *Dacelo novaeguineae* | Laughing Kookaburra | e |
| Artamidae | *Cracticus torquatus* | Grey Butcherbird | e |
| | *Gymnorhina tibicen* | Australian Magpie | e |
| | *Strepera graculina* | Pied Currawong | e |
| Cacatuidae | *Cacatua galerita* | Sulphur-crested Cockatoo | e |
| Campegphagidae | *Coracina novaehollandiae* | Black-faced Cuckoo Shrike | e |
| Columbidae | *Ocyphaps lophotes* | Crested Pigeon | e |
| Corvidae | *Corvus coronoides* | Australian Raven | e |
| Dicruridae | *Rhipidura albiscapa* | Grey Fantail | e |
| Maluridae | *Malurus cyaneus* | Superb Fairy-wren | e |
| Megapodidae | *Alectura lathami* | Australian Brushturkey | OS |
| Meliphagidae | *Manorina melanocephala* | Noisy Miner | OS |
| | *Anthochaera carunculata* | Red Wattlebird | OS |
| | *Anthochaera chrysoptera* | Little Wattlebird | h |
| Podargidae | *Podargus strigoides* | Tawny Frogmouth | e |
| Psittacidae | *Trichoglossus haematodus* | Rainbow Lorikeet | h |
| | *Platycercus elegens* | Crimson Rosella | e |
| | *Platycercus adscitus eximius* | Eastern Rosella | e |
| Strigidae | *Ninox boobook* | Southern Boobook | e |
| **MAMMALS** | | | |
| Felidae | *Felix catus** | Feral Cat | e |
| Molossidae | *Austronomus australis* | White-striped Freetail Bat | of (previous records in area) |
| Muridae | *Rattus rattus** | Black Rat | e |
| | *Mus muscalus** | House Mouse | e |
| Phalangeridae | *Trichosurus vulpecula* | Common Brushtail Possum | e |
| Pseudocheiridae | *Pseudocheirus peregrinus* | Common Ringtail Possum | e |
| Pteropodidae | *Pteropus polliocephalus* | Grey-headed Flying Fox | e |
| Vespertilionidae | *Chalinolobus gouldii* | Gould's Wattled Bat | of (previous records in area) |
| | *Miniopterus Schreibersii oceanensis* | Eastern Bentwing Bat | of |
| | *Vespadelus vulterus* | Little Forest Bat | of |
| **REPTILES** | | | |
| Agamidae | *Physignathus lesuerii* | Water Dragon | OS |
| Scincidae | *Lampropholis delicata* | Dark-flecked Garden Skink | OS |
| | *Saproscincus mustelinus* | Weasel Shade-skink | e |
| | *Tiliqua scincoides* | Common Bluetongue | e |
| | *Eulamprus quoyii* | Eastern Water Skink | e |

**Code**

OS - on site
OH – overhead
e – expected to visit occasionally
of - occasionally forage
h - characteristic call heard in nearby bushland
* introduced species
# - previous records derived from Anabat in area