



ACS Environmental  
Pty Ltd

**FLORA AND FAUNA SURVEYS  
AND  
BIODIVERSITY IMPACT ASSESSMENT  
FOR  
PROPOSED DEVELOPMENT  
AT  
40 SUNRISE ROAD,  
PALM BEACH, NSW, 2108**

**PREPARED FOR:**

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# ACS Environmental Pty Ltd

## **Flora and Fauna Surveys, Biodiversity and Ecological Impact Assessment and Bushland Plans of Management Services**

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## EXECUTIVE SUMMARY

In December 2020, ACS Environmental was commissioned by Susan Rothwell Architects of 40 Sunrise Road, Palm Beach, NSW C/o Naturally Trees to survey for flora and fauna and undertake a biodiversity impact assessment for the allotment at 40 Sunrise Road, Palm Beach.

The total area of the subject land proposed for development is estimated at about 1,527m<sup>2</sup>. The land currently appears to have been largely cleared of most native vegetation with a few remnant trees retained mostly around the edges/perimeter of the lower sections of the land.

The cleared areas can be delineated into an upper section of land, which in 2016 contained a single storey rendered residence which has since been demolished, a pile of rock rubble remains in the central area of this section of the land.

The lower section of land below some rock outcropping appears to have been recently cleared of all ground and most of the likely weed-infested shrub cover and appears as an expanse of bare earth and leaf litter.

The proposal is to build a new residence on the upper section of the subject land. Figures 5A and 5B indicate the lower ground floor and ground floor design plans of the proposed dwelling.

A total of only 6 indigenous naturally-occurring plant species, mostly occurring at low frequency and percentage cover was recorded over the subject area surveyed (Appendix 1). The canopy species Cheese Tree occurs naturally in the habitat of the subject site as also occurs for the creeper Scurvy Weed, the sedge *Cyperus laevis*, and the uncommon shrub/small tree species Orangebark and Hickory Wattle (Appendix 1).

Two non-locally occurring indigenous canopy tree species, Broad-leaved Paperbark and Swamp Oak, have been planted in habitats not naturally pertaining to these species, both of which typically occur in swampy or saline zonal environments.

The mapping and ground-truthing of the subject land indicate that the former natural plant community occurring at the land was likely described as Coastal Enriched Sandstone Dry Forest with some elements of Coastal Enriched Sandstone Moist Forest, the vegetation which has been extensively degraded and modified such that only a few remnant species are retained (Figures 1, 4, 5, 6, 8, 9 & 10). Only a few small individuals of Cheese Tree are proposed for removal with three to be retained, some of these to 10m tall (Scales 2020).

Coastal Enriched Sandstone Dry Forest and Coastal Enriched Sandstone Moist Forest are not listed on registers of the NSW BC Act (2016) or Commonwealth EPBC Act (1999).

Atlas of NSW Wildlife data records for an area of 5km radius around the subject site indicate that 6 flora species of conservation significance have been recorded within the last 20 years.

Habitat at the highly floristically and structurally modified subject site does not appear to be suitable for any of these species. Comprehensive targeted searches for particularly these, but other, conspicuous, mostly large life-form species in the mostly exotic-occurring assemblage of the study area did not locate these, or any other threatened flora species, in the subject area.

The DPIE Atlas of NSW Wildlife database (2021) recorded thirty one (31) species of terrestrial and avifauna listed as threatened under the BC Act within a 5 km radius of the site. Few of these threatened fauna species have been recorded within a 1km of the subject site and only the Grey-headed Flying Fox, Barking Owl and Powerful Owl are considered to have potential to occasionally forage at the site. These are all mobile species and have very large foraging ranges and the proposal to clear the mostly exotic and non-locally occurring tree species from the subject land is not considered to compromise these species' life cycles in relation to foraging, roosting and breeding.

In regard to threatened species legislation, the proposed development is considered to comply with the desired criteria in relation to The Pittwater Council LEP (2014) and Pittwater 21 Council DCP (2014).

It is considered that the development would be highly unlikely to have an adverse effect on the life cycle of any individual threatened flora or fauna species or their respective habitat. It is considered that for potential impacts to any threatened ecological communities or threatened flora or fauna, concurrence from the Director General of the Department of Planning, Industry and Environment is not required, nor is a Species Impact Statement necessary for the proposed development.

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 (Figure 16) and so not triggering biodiversity offsets; and
- It is assessed and considered that no threatened species (of both flora and fauna) would be significantly impacted by the small area of the proposed development at the eastern vegetated section of the subject land.

- It appears that the highly degraded vegetation does not conform to the definition of an endangered ecological community, the vegetation having been extensively cleared, and has been greatly floristically and structurally modified. The scale of initial potential loss of habitat is small (<0.25ha), and as such, this development based on threatened species occurrence and potential impacts of development is considered not to trigger the offsets scheme.

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

## GLOSSARY AND ACRONYMS

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

DPIE \_ Department of Planning, Industry 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)

OEH - State Office of Environment and Heritage

PCT - Plant Community Type identified as such using the Bionet Vegetation Classification system (OEH 2018)

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

# INTRODUCTION

## 1.1 Proposed development

In December 2020, ACS Environmental was commissioned by Susan Rothwell Architects of 40 Sunrise Road, Palm Beach, NSW C/o Naturally Trees to survey for flora and fauna and undertake a biodiversity impact assessment for the allotment at 40 Sunrise Road, Palm Beach.

The total area of the subject land proposed for development is estimated at about 1,527m<sup>2</sup>. The land currently appears to have been largely cleared of most native vegetation with a few remnant trees retained mostly around the edges/perimeter of the lower sections of the land.

Figure 1 is an aerial image showing the subject land, indicating surrounding built structures and vegetated areas throughout the property. The southern-most boundaries of the mapping appear somewhat aberrant in relation to the location of the land (Figure 1).

The cleared areas can be delineated into an upper section of land, which in 2016 contained a single storey rendered residence which has since been demolished (Figure 2), a pile of rock rubble remains in the central area of this section of the land (Figure 3).

The lower section of land below some rock outcropping appears to have been recently cleared of all ground and most of the shrub cover and appears as an expanse of bare earth and leaf litter (Figure 4).

The proposal is to build a new residence on the upper sections of the subject land. Figures 5A and 5B indicates the lower ground floor and ground floor design plans of the proposed dwelling.

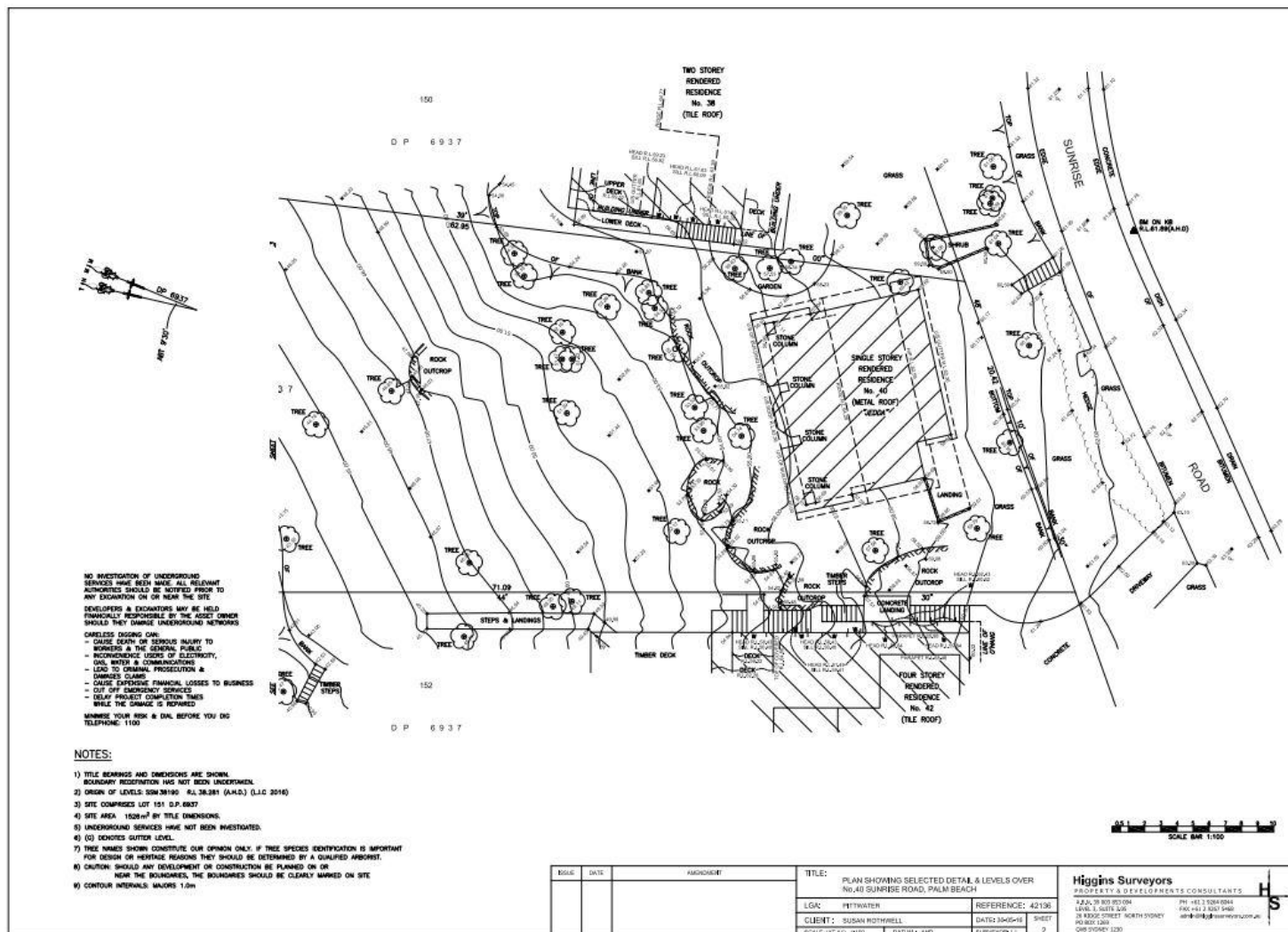
Figure 6 is a schematic arboricultural tree management plan depiction by Scales (2020) showing the location of the proposed dwelling house and the distribution of canopy trees located on the subject land.

Architectural plans submitted with this application should be consulted for detail, the proposed subdivision layout indicated in the arboricultural impact assessment report by Scales (2020).

Figure 7 is an aerial depiction of the subject area showing the land in relation to established development in the local area.



**Figure 1** - Aerial image of location of land proposed for development at 40 Sunrise Road, Palm Beach (red outline) (from SIXmaps 2021)



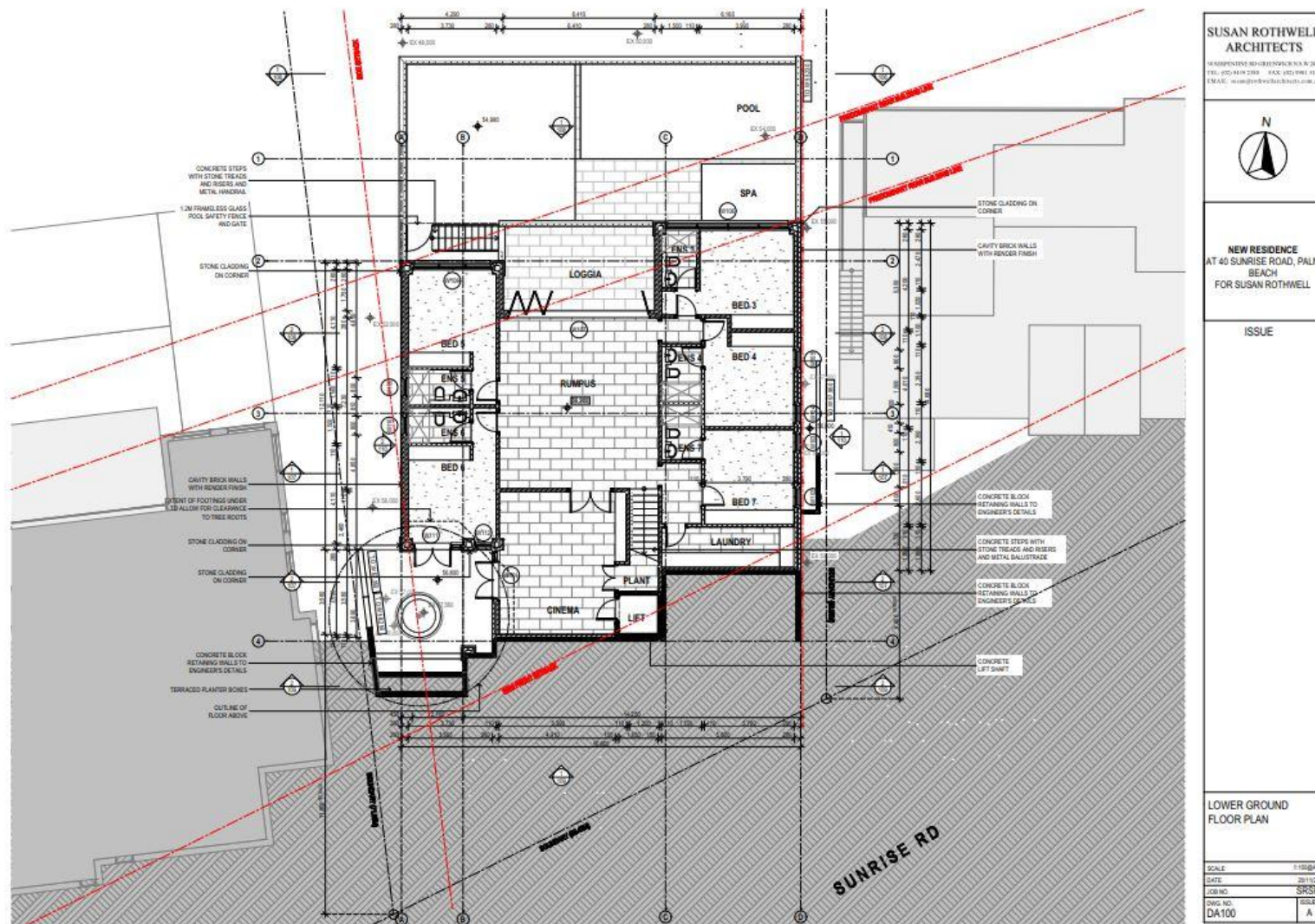
**Figure 2** - Survey Plan of location of land proposed for development at 40 Sunrise Road, Palm Beach, indicating contours and location of previous residence in 2016 (from Higgins Surveyors 2016)



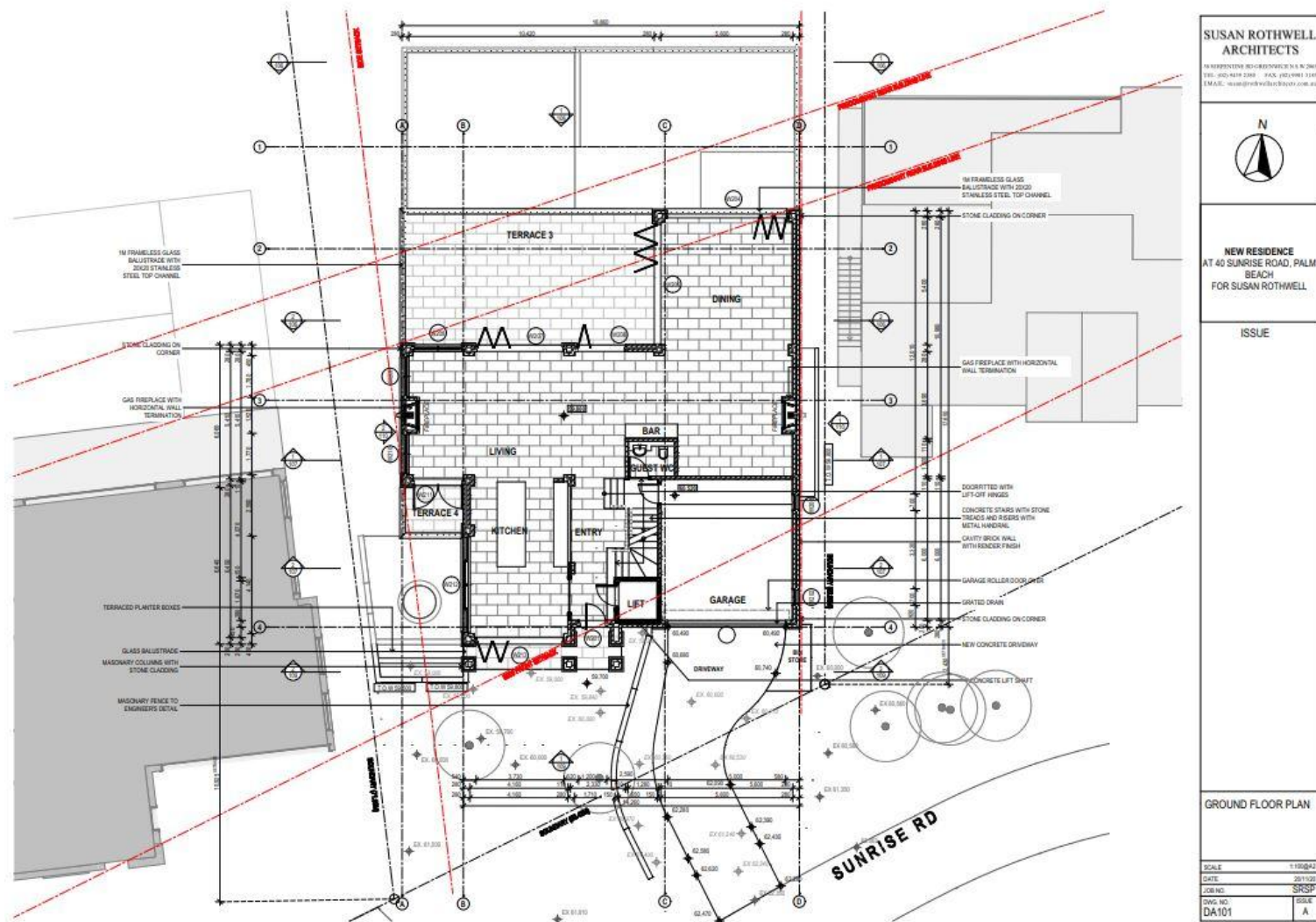
**Figure 3** - Rock rubble pile located in upper section of the subject land, derived from footings and associated structures of previous residence



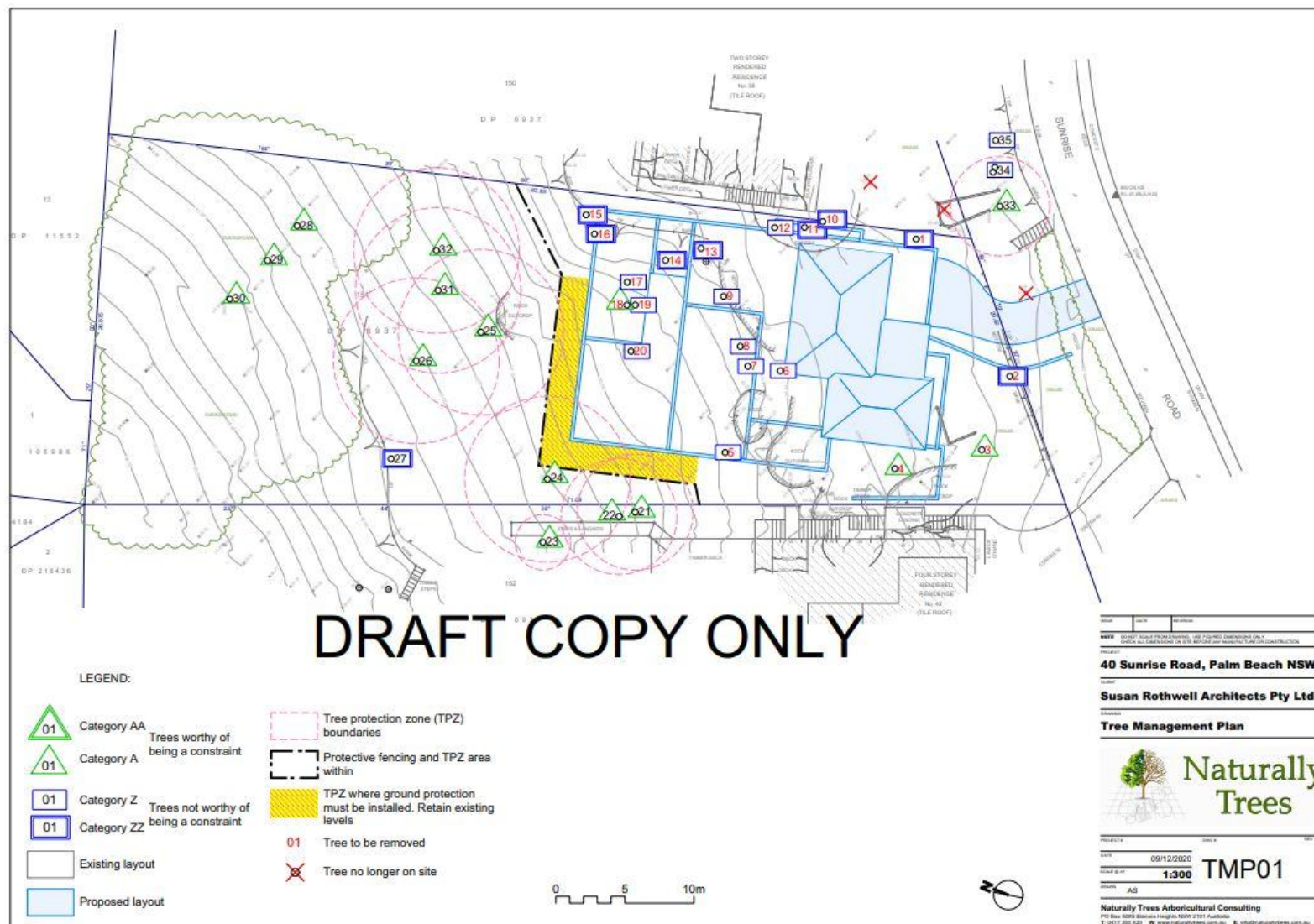
**Figure 4** - Cleared ground and understorey stratum typical of lower sections of subject property with high cover of bare earth, leaf litter and exposed sandstone rock



**Figure 5A** - Design Plan of Lower Ground Floor Plan of proposed residence at 40 Sunrise Road, Palm Beach (from Susan Rothwell Architects 2020)



**Figure 5B - Design Plan of Ground Floor Plan of proposed residence at 40 Sunrise Road, Palm Beach (from Susan Rothwell Architects 2020)**



**Figure 6** - Schematic plan of proposed residence at the subject land also showing established trees as numbered by Scales (2020)



**Figure 7** - Aerial view of subject land (bordered in red outline) in relation to development in locality including roads, residential development and waterways

## 1.2 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 Pittwater LEP 2014 cl. 7.6 Biodiversity and Pittwater 21 DCP 2014.

## 1.3 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 March 2020) as well as Provisional Listings of Endangered Species on an emergency basis (to March 2020),

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 (2018).
- ◆ 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:

- ◆ Pittwater Local Environment Plan (2014) and Pittwater 21 Development Control Plan (2014)

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 in the Northern Beaches Council LGA.

#### **1.4 Documents provided**

- ◆ Scales, A. (2020) Arboricultural Impact Appraisal of 40 Sunrise Road, Palm Beach
- ◆ Higgins Surveyors (2016) Survey Plan of 40 Sunrise Road, Palm Beach
- ◆ Susan Rothwell Architects (2020) Architectural plans for new residence at 40 Sunrise Road, Palm Beach

#### **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 Susan Rothwell Architects C/O Naturally Trees 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.

## 2 EXISTING ENVIRONMENT

### 2.1 Topography, geology and soils

The site has a northerly aspect sloping downwards at gradients of 10 - 20° from Sunrise Road (Figure 1).

The local substrate geology of the upslope part of subject area, to about 20m downslope of the top boundary at 40 Sunrise Road, Palm Beach, is Hawkesbury Sandstone (Herbert 1983). The lower section of the subject land occurs at the boundaries of the uppermost Hawkesbury Sandstone overlying sediments of the Narrabeen Sandstone. The Sandstone-based substrate is largely comprised of medium to coarse-grained quartz sandstone with minor shale and laminite lenses whereas the Narrabeen Sandstone is compromised of interbedded laminite, shale and quartz, to lithic quartz sandstone (Herbert 1983).

The soil landscape series of the Hawkesbury Sandstone component of the landscape is the colluvial Hawkesbury Soil Landscape Series whereas the Watagan Soil Landscape Series is associated with the Narrabeen Sandstone sediments (Chapman & Murphy 1989).

### 2.2 Existing vegetation

The subject land has been largely cleared of natural vegetation.

The land can be delineated into two sections, an upper section sloping at 10 - 15° from the top boundary to below a series of sandstone rock outcroppings about 20m down slope from the upper boundary (Figure 1), and the lower section with gradients of about 15 - 20° extending to about 55m to the lower boundary of the land (Figure 1), the delineation between the two sections of land marked by the yellow dashed line on Figure 1.

#### Upper Section of land

The general vegetation of the upper section of the subject land consists of an exotic grassland containing a rubble pile of rock debris from the demolition of a previous dwelling (Figure 3), with mostly exotic ornamental species such as Frangipani, Oleander and Cape Honeysuckle, as well as individuals of non-locally occurring indigenous species such as Swamp Oak and Broad-leaved Paperbark, planted along the perimeters of this section of land (Figure 8).



**Figure 8** - Indicating area of upper section of subject land with Cape Honeysuckle along upper boundary and Broad-leaved Paperbark planted along western boundary

### **Lower Section of land**

The lower section of land appears to have been mostly cleared of ground cover and scrub vegetation, which may have included a high frequency of Lantana and other woody weeds and twiners such as Morning Glory, a high density of which remains at the very lower part of this section of the land (Figures 4 & 9).

Remnant individuals of Cheese Tree (*Glochidion ferdinandi*) have been retained along sections of the perimeters of this area with planted exotic ornamentals such as Frangipani and Wild Banana and non-locally occurring native species such as Broad-leaved Paperbark also prominent in the assemblage (Figures 4 & 10).

The extent of bare ground and leaf litter is about 75% with about 10% of exposed sandstone rock (Figures 4 & 10).



**Figure 9** - Indicating dense scrub of Lantana and Morning Glory occurring at the base of the subject land, the higher sections apparently cleared of this infestation



**Figure 10** - Planted individual of Broad-leaved Paperbark on RHS of image and small tree of Hickory Wattle at LHS of image, with cleared ground cover with bare ground and leaf litter

### **2.3    *Current and surrounding land use***

The aerial view of the subject land at No. 40 Sunrise Road, Palm Beach, indicates that most of the surrounding landscape has long been established as residential development on moderate to steep hillslopes, though retaining a fair extent of the tall tree canopy of the locality (Figure 7; from SIXmaps DPIE 2021).

## **3 FLORA AND FAUNA 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 DPIE Atlas of NSW Wildlife (online BioNet), Commonwealth DAWE Environmental Reporting Tool (January 2021) and RoTAP (Briggs and Leigh 1996) databases. Other literature detailing regionally and locally threatened and significant flora and fauna, as well as plant communities of the study area, included NSW Scientific Committee Final Determinations (1996-2021), Benson and Howell (1994), OEH (2016) 'The Native Vegetation of the Sydney Metropolitan Catchment Management Authority Area' and DPIE Mapping (2021).

#### **3.1.2 Site survey**

The subject site was surveyed on 14<sup>th</sup> January 2021.

#### **3.1.3 Flora survey**

Currently existing information on 'Threatened Flora of the Locality', defined as a 10km x 10km area centred around the site, was accessed from the DPIE Atlas of NSW Wildlife (January 2021), the Department of Agriculture, Water and Environment (DAWE) Environmental Reporting Tool (January 2021), 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 - 2021) 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 populations present on the subject area.

As the subject land was largely cleared, highly structurally and floristically modified and degraded, a quadrat-based (20 x 50m) methodology was not undertaken.

The survey included a complete 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.

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

#### **3.1.4 Fauna Survey**

The survey effort complies with the survey effort recommended by the Draft Guidelines for Threatened Species Assessment under Part 3A (DEC and DPI, 2004) for the study area size, habitat types available on the site and seasonal factors.

A dedicated ground search was undertaken as was a census of extant birds. The survey involved different search strategies and protocols and all extant fauna or evidence of fauna was recorded. Threatened fauna species not recorded in the surveys but with the potential to be present as indicated by habitat are considered in the final assessment.

#### **Strategies employed for the field investigation of the Study Area:**

Assessment of the value of habitat suitable for native fauna species and specific habitat structures/resources considered important in life cycles. These structures or resources include:

- Mature trees with hollows for breeding, roosting and/or nesting;
- Particular foraging resources such as certain tree or shrub species;
- Dispersal, migratory or foraging corridors for fauna;
- Leaf litter and ground search for reptiles, frogs and threatened invertebrates;
- Identification of scats and other indirect evidence to suggest fauna utilisation such as tracks, scratch marks or diggings;

#### **3.1.5 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.

These criteria are qualified in respect of threatened flora species in Appendix 2 of this report and in relation to threatened species of fauna in Appendix 4 of this report.

## **3.2 Results - Flora**

### **3.2.1 Landscape features**

The subject site occurs within the Pittwater IBRA subregion of the Sydney Basin IBRA Region.

### **3.2.2 Indigenous and exotic plant species**

The subject site contains a section of exotic grassland and cleared bushland containing some remnant and planted native and exotic tree and shrub species, the total land having an area of about 1,530m<sup>2</sup> on a relatively steep sloping section of land at 40 Sunrise Road, Palm Beach (Figures 1, 2, 4, 5, 6, 7, 8, 9 & 10).

Appendix 1 lists the various plant species found to occur within the boundaries of the subject site. All tree species occurring within the property boundaries and in the surrounding vicinity have been tabulated and mapped in Scales (2020) and have been included in the appendix, the attributes and condition of the trees adequately addressed in Scales (2020).

Species nomenclature follows that of Harden (1990 – 2002; 2021 online).

A total of only 6 indigenous naturally-occurring plant species, mostly occurring at low frequency and percentage cover was recorded over the subject area surveyed (Appendix 1). The canopy species Cheese Tree occurs naturally in the habitat of the subject site as also occurs for the creeper Scurvy Weed, the sedge *Cyperus laevis*, and the uncommon shrub/small tree species Orangebark and Hickory Wattle (Appendix 1).

A total of 2 indigenous canopy tree species, Broad-leaved Paperbark and Swamp Oak, have been planted in habitats not naturally pertaining to these species, both of which typically occur in swampy or saline zonal environments.

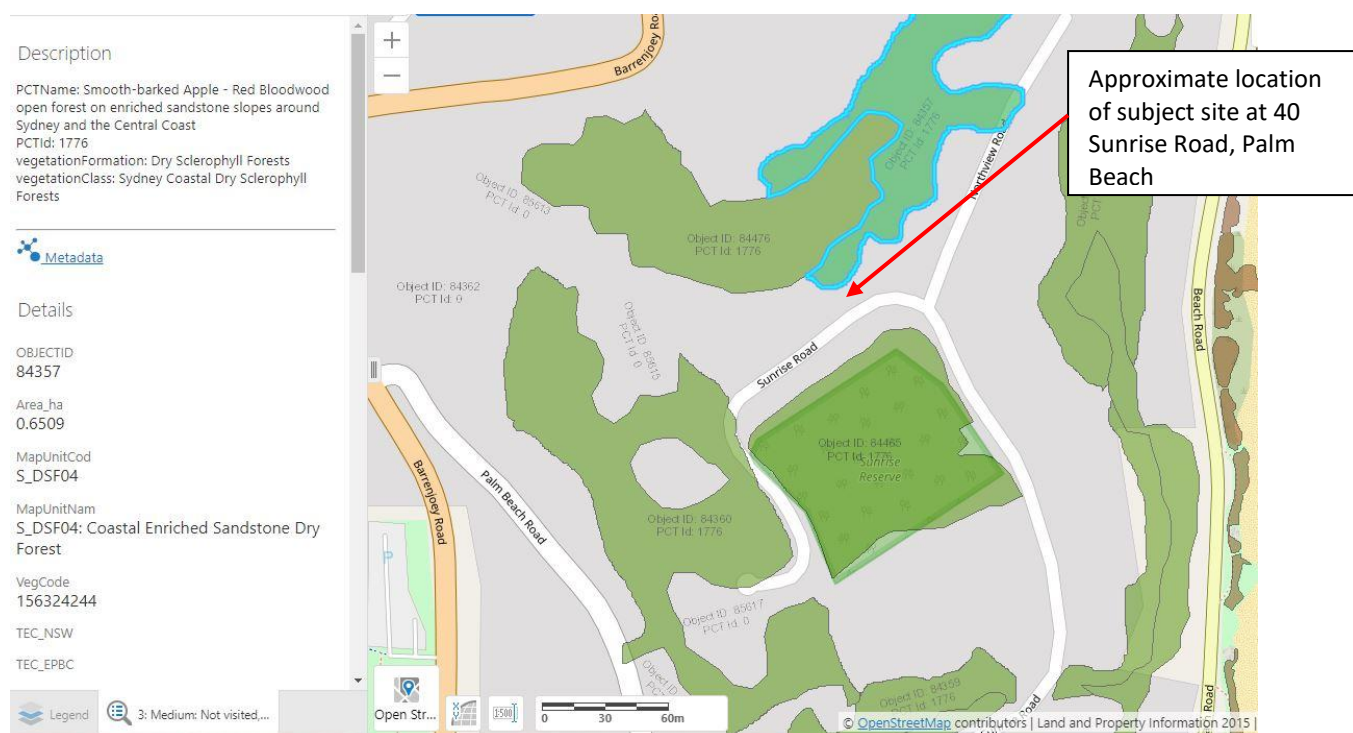
A total of 8 ornamental plant species have been planted within the property (Appendix 1; Scales 2020).

A total of 16 exotic weed species were recorded over the area of the subject land (Appendix 1).

### 3.2.3 Plant community

#### Previous mapping

The local ecological plant community that occurs at and surrounding the Study Area has been mapped by DPIE (2021) compiling data from API and environmental attributes of geology, average annual rainfall, topography, elevation, Soil Landscape Series type and extent of disturbance (condition), and including some ground-truthing (Figure 11) (DPIE 2021).



**Figure 11** - DPIE (2021) mapping of ecological communities occurring at the subject site (Coastal Enriched Sandstone Dry Forest area bounded in aqua green outline) and in the neighbouring locality.

The subject site appears to occur within cleared areas of the surrounding forest distributions (Note the Code: PCT 1776 refers to Coastal Enriched Sandstone Dry Forest)

### 3.2.4 Conservation status of Coastal Enriched Sandstone Dry Forest

#### Description and status of ecological community

Natural stands of Coastal Enriched Sandstone Dry Forest occurs on upper slopes and dry gullies of Sydney urban areas (OEH 2016). In its natural condition, this community forms a tall open forest that may include Sydney Red Gum (*Angophora costata*), Red Bloodwood (*Corymbia gummifera*), Sydney Peppermint (*Eucalyptus piperita*) and Broad-leaved White Mahogany (*Eucalyptus umbra*). At the lower heights of the eucalypt stratum it is common to find an open cover of Black Sheoak (*Allocasuarina littoralis*), Blueberry Ash (*Elaeocarpus reticulatus*) and Sweet Pittosporum (*Pittosporum undulatum*). May intergrade with some elements of Coastal Enriched Sandstone Moist Forest (OEH 2016).

Coastal Enriched Sandstone Dry Forest and Coastal Enriched Sandstone Moist Forest are not listed on registers of the NSW BC Act (2016) or Commonwealth EPBC Act (1999).

#### Status of ecological community occurring at subject site

The mapping and ground-truthing of the subject land indicate that the former natural plant community occurring at the land has been extensively degraded and modified such that only a few remnant species are retained (Figures 1, 4, 5, 6, 8, 9 & 10). Only a few small individuals of Cheese Tree are proposed for removal with three to be retained, some of these to 10m tall (Scales 2020).

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

#### Trees proposed for removal

For the proposed location of the new dwelling four individuals of naturally occurring Cheese Tree from 4 - 8m tall are proposed to be removed (Figure 6, Scales 2020). Figure 6 indicates the location of these individuals in the subject area and in relation to the proposed residence. Individuals of Cheese Tree documented by Scales (2020) as Tree Numbers 9, 17, 18 & 20 are depicted in Figure 6.

All other trees to be removed occur either planted ornamental species such as Frangipani, Jacaranda and Oleander or planted indigenous species occurring in non-typical habitats such as Broad-leaved Paperbark and Swamp Oak (Scales 2020).

Table 1 indicates the attributes of these naturally-occurring individuals of Cheese Tree.

Number/Attribute	Number 9	Number 17	Number 18	Number 20
Height (m)	4	7	8	7
Canopy Spread (m)	3	5	7	5
DBH (mm)	50	300	450	300
TPZ (m)	2	3.6	5.4	3.6
Foliage (%)	70%	60%	70%	60%
Defects/Comment	Nil	Lopped/epicormic	Nil	Lopped/epicormic
Location	Grass	Natural ground	Natural ground	Natural ground

**Table 1** - Attributes of four individuals of Cheese Tree proposed for removal from a total of seven trees (Scales 2020).

#### **Mitigation measures to offset loss of trees**

These individuals, some of which are relatively immature (Table 1 ), can readily be replaced by planting in 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 Broad-leaved Paperbark will be retained as will be 3 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) will also provide food resources and sheltering opportunity.

### **3.2.6 Flora species of conservation significance**

#### **Threatened species**

The DPIE Atlas of NSW Wildlife (2021) records for an area of 5km radius around the subject site indicate that 6 species of conservation significance have been recorded within a radius of 5km of the site within the last 20 years (Table 2).

Three of these species are listed as Endangered on the BC Act with three listed as Vulnerable, with one species listed as Endangered and three Vulnerable on the Commonwealth EPBC Act.

Appendix 2 lists these species with an account of their threatened status, geographical range, physiognomic attributes, habitat features and likelihood of occurrence.

**Table 2** - Six (6) species of threatened flora that have been recorded within a 10km area centred around the subject site within the last 20 years (DPIE 2020)

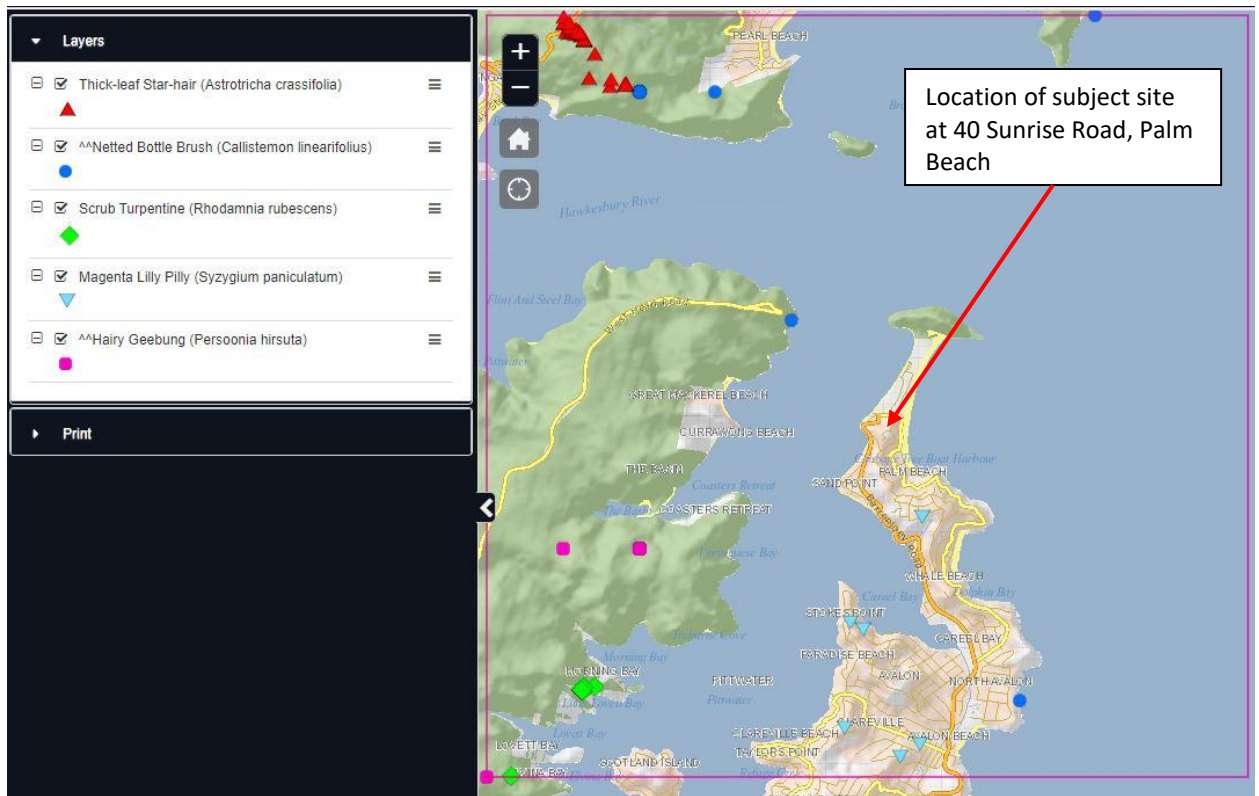
Family	Common name	Scientific name	<a href="#">NSW status</a>	<a href="#">Comm. status</a>	No. of records
<b>Araliaceae</b>	Thick-leaf Star-hair	<i>Astrotricha crassifolia</i>	V	V	42
<b>Myrtaceae</b>	Netted Bottle Brush	<i>Callistemon linearifolius</i>	V,3		23
	Scrub Turpentine	<i>Rhodamnia rubescens</i>	E4A		10
	Magenta Lilly Pilly	<i>Syzygium paniculatum</i>	E1	V	7
<b>Proteaceae</b>		<i>Grevillea shiressii</i>	V	V	1
	Hairy Geebung	<i>Persoonia hirsuta</i>	E1,P,3	E	5

For all of these species, the cleared, highly modified, degraded habitat of the subject site appears unsuitable for their occurrence (Appendix 2) (Figures 4, 5, 6, 8, 9 & 10).

Figure 12 indicates the recorded sightings of five of these flora species of conservation significance.

Most recordings of Magenta Lilly Pilly are planted individuals obtained from nurseries. The habitat is not suitable for natural occurrences of this species.

None of the threatened flora species occurs or was expected to occur at or in the vicinity of the subject site (Figure 12), with populations of *Grevillea shiressii* occurring to the north at Pearl Beach.



**Figure 12** - Recorded sightings of 5 threatened flora species within a 5km radius of the subject site at 40 Sunrise Road, Palm Beach, including records of the nearest record of planted individuals of Magenta Lilly Pilly observed to the south of the subject site at Whale Beach (DPIE 2021)

### 3.3 Results - Fauna and habitat potential assessment

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.

#### 3.3.1 Location and weather conditions of subject surveyed site

##### Grid co-ordinates of centre of subject land;

latitude: -33.5942104° ;

longitude: 151.3223333°

##### Weather conditions

Weather Station at Terry Hills Stn 066059

Mild, warm and relatively humid weather conditions with light winds, no rain

14 <sup>th</sup> January 2021	9am	3pm
Temp	21.3 <sup>0</sup>	29.3 <sup>0</sup>
Wind	NNE 6km/hr	ENE 15km/hr

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.

### 3.3.2 Habitats present

The habitats of the subject land include:

1. a cleared, unmanaged front and rear yard, with exotic grassland at the upper slopes and bare ground with extensive leaf litter at the lower slopes (Figures 4, 5, 6, 8, 9 & 10),
2. a bushland perimeter area around the southern, western and eastern boundaries containing both remnant indigenous trees, mainly Cheese Tree, and some planted individuals of Broad-leaved Paperbark, Frangipani, Jacaranda, Oleander and Wild Banana (Figures 4, 5, 6, 8, 9 & 11), and
3. Rock outcrops and shelves about 20m down the slope differentiating the upper section of yard from the lower slopes (Figure 13).



**Figure 13** - Sandstone rock shelves and outcrops occur about 20m down the slope of the subject land

The exotic grassland/herbland provides poor habitat but may provide some food resources for seed foraging avifauna.

Canopy trees may provide sheltering and seasonal food resources for avifauna, arboreal species and the Grey-headed Flying Fox. Large hollows for owl species were not recorded within the study area. An arboreal nest belonging to the Grey Butcherbird was located in an individual of Loquat about 2m above the ground.

The mid-slope area of the subject land contained a series of low rock shelves, overhangs and crevices that may provide safe foraging habitat and potential shelter for small terrestrial fauna species such as skinks (Figure 13).

### 3.3.3 Wildlife corridor potential

The subject area occurs as a highly degraded and structurally modified landscape within an area with some retained bushland (Figures 4, 5, 6, 7, 8, 9 & 10). The presence of canopy trees around the perimeter afford some connectivity for avian and arboreal species in the locality.

### 3.3.4 Fauna recorded

**Table 3** - Indicates the fauna recorded or expected to occur within the area of survey at Palm Beach.

Class/Family	Common name	Scientific name	Degraded forest vegetation and extensive bare areas
<b>REPTILIA</b> Scincidae	Dark-flecked Garden Sunskink	<i>Lampropholis delicata</i>	x
	Eastern Water Skink	<i>Eulamprus quoyii</i>	e
<b>AVES</b> Alcedinidae	Laughing Kookaburra	<i>Dacelo novaeguineae</i>	e
Cacatuidae	Galah	<i>Eolophus roseicapillus</i>	e
	Sulphur-crested Cockatoo	<i>Cacatua galerita</i>	x
Cracticidae	Magpie	<i>Gymnorhina tibicen</i>	x
	Grey Butcherbird	<i>Cracticus torquatus</i>	x
Psittacidae	Crimson Rosella	<i>Platycercus elegans</i>	e
	Rainbow Lorikeet	<i>Trichoglossus haematodus</i>	x
Maluridae	Superb Fairy-wren	<i>Malurus cyaneus</i>	e
Meliphagidae	Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>	e
	Noisy Miner	<i>Manorina flavigula</i>	x
	Little Wattle Bird	<i>Anthochaera chrysoptera</i>	x
Megapodiidae	Australian Brush Turkey	<i>Alectra lathamii</i>	e
Corvidae	Australian Raven	<i>Corvus coronoides</i>	e
Hirundinidae	Welcome Swallow	<i>Hirundo neoxena</i>	x

<b>MAMMALIA</b>			
Pseudocheiridae	Common Ringtail possum	<i>Pseudocheirus peregrinus</i>	e
Phalangeridae	Common Brushtail Possum	<i>Trichosurus vulpecula</i>	e
Peramelidae	Long-nosed Bandicoot	<i>Perameles nasuta</i>	x(diggings)
Pteropodidae	Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	e
Vespertilionidae	Gould's Wattled Bat	<i>Chalinolobus gouldii</i>	e
Muridae	Black Rat*	<i>Rattus rattus</i>	e

Legend:

x - observed either onsite or overhead or heard in vicinity; e - expected to occur onsite and in vicinity

The weather conditions at the time of survey included mild warm temperatures, high humidity.

Of the bird species observed or expected to occur, most were species that prefer a woodland habitat (Table 3). There was no dominant species among the birds, although the Butcherbird was particularly active, with each occupying selective niches.

The Powerful Owl (*Ninox strenua*) may occasionally forage within the area if prey species are in abundance. However during the survey, prey for this large owl did not appear sufficient in number to attract it to the area at the present time.

The Common Brushtail Possum (*Trichosurus vulpecula*) is expected to occur within the derived degraded forest habitat.

No trees within the surveyed area contained any small hollows or spouts that could accommodate small mammals or birds.

The Little Forest Bat (*Vespadelus vulturnus*), and Gould's Wattled Bat (*Chalinolobus gouldii*) may be expected to occur occasionally for foraging. The Little Forest Bat roosts in hollows in old trees, buildings and timber stacks. These bat species have been recorded in a location near to the subject site in 2014 and are common insectivorous microbat species in the region.

The larger megabat, Grey-headed Flying Fox (*Pteropus poliocephalus*) was not sighted during the survey, which occurred during mid-morning when the bats would be roosting in camps, but may be attracted to flowering Eucalyptus and Melaleuca trees on occasion during the warmer months.

Reptilian habitat was rated as relatively good within the subject land. Rock outcrops, crevices and overhangs, as well as leaf litter was rated good for sheltering. The Dark-flecked skink (*Lampropholis delicata*) was recorded at this location.

Habitat for amphibian species was rated as poor as no drainage lines or ponds occur at the developed subject site

The pest species Black Rat and House Mouse may be expected to occur occasionally at and in the vicinity of the subject site in association with a long history of human occupation in the locality (Table 3).

### 3.3.5 Fauna species of conservation significance

#### 3.3.5.1 Threatened species

The criteria used to assess the likelihood of threatened species occurring in the Study Area include the specificity of habitat features such as tree canopy cover, relative soil moisture regime, relative soil nutrient regimes, 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.

The DPIE Atlas of NSW Wildlife database 2021 (Dept Planning, Industry and Environment) listed thirty one (31) species of terrestrial and avifauna considered threatened under the BC Act within a 5 km radius of the site (Table 4). Four of these species are designated as endangered by the NSW Scientific Committee with the remainder designated as vulnerable. Under the EPBC Act 1999, four species are designated as endangered and five species are listed as vulnerable.

Family	Common name	Scientific name	NSW status	Comm. status	No. of records
<b>Amphibia</b> <b>Myobatrachidae</b>	Red-crowned Toadlet	<i>Pseudophryne australis</i>	V		48
<b>Limnodynastidae</b>	Giant Burrowing Frog	<i>Heleioporus australiacus</i>	V	V	79
<b>Reptilia</b> <b>Varanidae</b>	Rosenberg's Goanna	<i>Varanus rosenbergi</i>	V		3
<b>Aves</b> <b>Columbidae</b>	Rose-crowned Fruit-Dove	<i>Ptilinopus regina</i>	V		1
<b>Accipitridae</b>	White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	V		26
	Little Eagle	<i>Hieraaetus morphnoides</i>	V		1
<b>Burhinidae</b>	Bush Stone-curlew	<i>Burhinus grallarius</i>	E1		35
<b>Cacatuidae</b>	Glossy Black-Cockatoo	<i>Calyptorhynchus lathami</i>	V		28
<b>Psittacidae</b>	Little Lorikeet	<i>Glossopsitta pusilla</i>	V		1
	Swift Parrot	<i>Lathamus discolor</i>	E1	CE	2
	Turquoise Parrot	<i>Neophema pulchella</i>	V		1

Family	Common name	Scientific name	NSW status	Comm. status	No. of records
<b>Aves</b> <b>Strigidae</b>	Barking Owl	<i>Ninox connivens</i>	V		6
	Powerful Owl	<i>Ninox strenua</i>	V		138
<b>Tytonidae</b>	Masked Owl	<i>Tyto novaehollandiae</i>	V		3
<b>Dasyornithidae</b>	Eastern Bristlebird	<i>Dasyornis brachypterus</i>	E1	E	1
<b>Artamidae</b>	Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	V		1
<b>Petroicidae</b>	Scarlet Robin	<i>Petroica boodang</i>	V		1
<b>Mammalia</b> <b>Dasyuridae</b>	Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	V	E	9
<b>Peramelidae</b>	Southern Brown Bandicoot (eastern)	<i>Isodon obesulus obesulus</i>	E1	E	10
<b>Phascolarctidae</b>	Koala	<i>Phascolarctos cinereus</i>	V	V	26
<b>Burramyidae</b>	Eastern Pygmy-possum	<i>Cercartetus nanus</i>	V		6
<b>Petauridae</b>	Squirrel Glider	<i>Petaurus norfolcensis</i>	V		1
<b>Pteropodidae</b>	Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	V	V	46
<b>Molossidae</b>	Eastern Coastal Free-tailed Bat	<i>Micronomus norfolkensis</i>	V		3
<b>Vespertilionidae</b>	Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	V	V	6
	Southern Myotis	<i>Myotis macropus</i>	V		4
	Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	V		3
	Eastern Cave Bat	<i>Vespadelus troughtoni</i>	V		3
<b>Miniopteridae</b>	Little Bent-winged Bat	<i>Miniopterus australis</i>	V		20
	Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	V		24
<b>Muridae</b>	New Holland Mouse	<i>Pseudomys novaehollandiae</i>		V	2

**Legend to Table 4 - BC Act, EPBC Act, Migratory Bird Agreements**

<b>Key</b>	
Environmental Protection and Biodiversity Conservation Act (EPBC Act) 1999	Biodiversity Conservation Act (BC Act) 2016
CE - Critically Endangered	E1 - Endangered
E - Endangered	E4 - critically endangered
V - Vulnerable	V - Vulnerable
	C CAMBA Migratory bird agreement between Australia and China

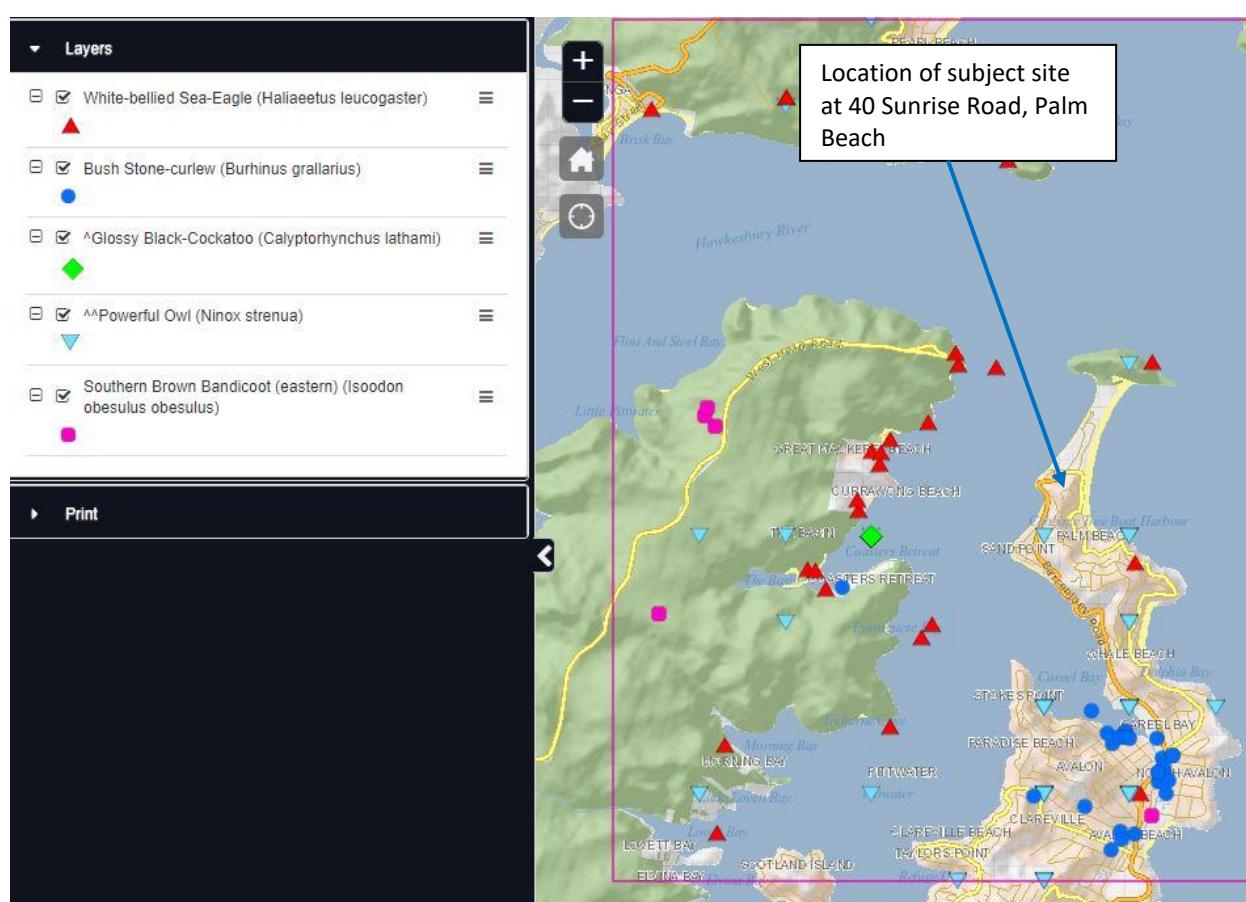
**Table 4 - 31 species of threatened fauna recorded within 5km radius of the subject site within the previous 20 years (DPIE Bionet Atlas 2021).**

### 3.3.5.2 Threatened species with potential to occur at the subject land

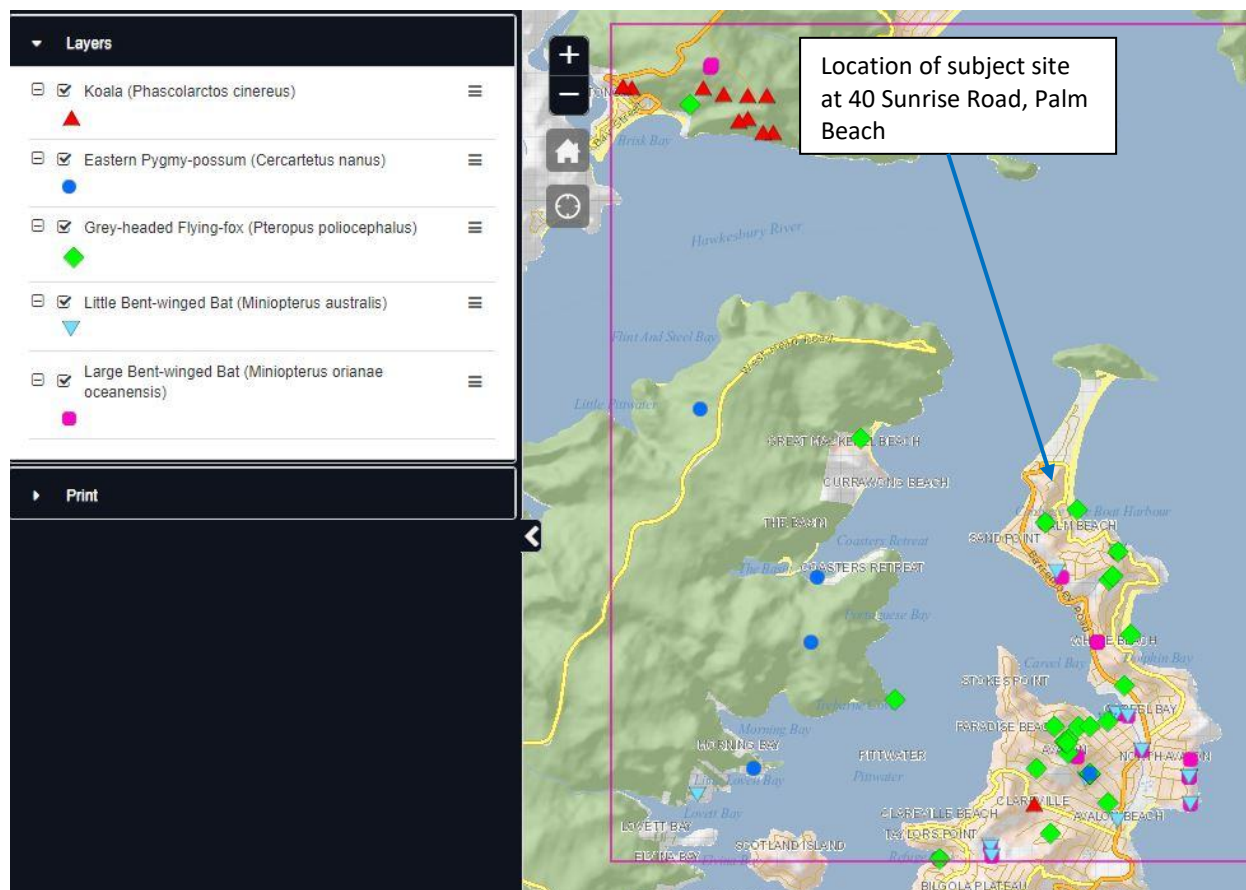
All threatened species listed require specific habitat for foraging, nesting or roosting. The subject land was assessed for these habitat requirements (refer to Appendix 3).

Due to the highly modified and degraded habitat of the subject site, no threatened fauna species are considered likely to regularly occur as indicated by the recorded sightings of threatened fauna species in the locality. Figures 14 and 15 indicate the most recorded threatened fauna species

Figure 14 indicates the locations of 5 fauna species with most recorded sightings in the locality.



**Figure 14** - Indicates recorded sightings of 5 threatened fauna species in the locality of the subject site, activity from the Powerful Owl occurs to the south of the subject site



**Figure 15** - Indicates recorded sightings of 5 threatened fauna species in the locality of the subject site, activity from the Grey-headed Flying Fox occurs to the south of the subject site

Three threatened species occurring closest, or in the vicinity, of the site include the following (See Appendix 3 for habitat assessment):

1. **Powerful Owl** (*Ninox strenua*) The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest.

The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine *Syncarpia glomulifera*, Black She-oak *Allocasuarina littoralis*, Blackwood *Acacia melanoxylon*, Rough-barked Apple *Angophora floribunda*, Cherry Ballart *Exocarpus cupressiformis* and a number of eucalypt species (DPIE 2021).

The main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider. Flying foxes are important prey in some areas; birds comprise about 10-50% of the diet depending on the availability of preferred mammals. As most prey species require hollows and a shrub layer, these are important habitat components for the owl (DPIE 2021).

Pairs of Powerful Owls demonstrate high fidelity to a large territory, the size of which varies with habitat quality and thus prey densities. In good habitats a mere 400ha can support a pair; where hollow trees and prey have been depleted the owls need up to 4000 ha (DPIE 2020).

The Powerful Owl may forage in the area of the subject land from time to time and be an infrequent visitor due to the cleared open structured vegetation but the removal of a few individuals of Cheese Tree will not affect the life-cycle or viability of populations of the Powerful Owl in the locality.

2. Grey-headed Flying Fox (*Pteropus poliocephalus*). This species congregates in large camps and is found in a variety of habitats including rainforest, mangroves, Melaleuca swamps, wet and dry sclerophyll forests and also cultivated areas. The species feeds on the blossoms of more than 80 plant species, especially eucalyptus blossom and the fruits of a number of palm species. Flowering species of eucalypts such as Swamp Mahogany (*Eucalyptus robusta*) and Forest Red Gum (*Eucalyptus tereticornis*) and Paperbarks (*Melaleuca quinquenervia*), are particularly important. Distances of up to 30km from the camp are often travelled, with 60-70km sometimes covered per night to reach a particular food source.

The Grey-headed Flying Fox (*Pteropus poliocephalus*) was not sighted during the survey, which occurred during mid-morning when the bats would be roosting in camps, but may be attracted to flowering Melaleuca trees on occasion during the warmer months.

The habitat for this species may occur at the subject site as it forages for nectar amongst the remaining Melaleuca trees (Scales 2020). It is considered that as the area that is proposed to be impacted is very small, with the removal of only two Melaleuca trees from a total of 10 trees, compared to its large foraging range in the locality, this species will not be compromised by the proposed development for the subject site (OEH 2019).

3. Barking Owl (*Ninox connivens*). Inhabits eucalypt woodland, open forest, swamp woodlands and, especially in inland areas, timber along watercourses. Dense vegetation is used occasionally for roosting. During the day they roost along creek lines, usually in tall understorey trees with dense foliage such as *Acacia* and *Casuarina* species, or the dense clumps of canopy leaves in large *Eucalypts*. Live alone or in pairs. The owls sometimes extend their home range into urban areas, hunting birds in garden trees and insects attracted to streetlights (DPIE 2021).

Preferentially hunts small arboreal mammals such as Squirrel Gliders and Common Ringtail Possums, but when the loss of tree hollows decreases these prey populations, the owl becomes more reliant on birds, invertebrates and terrestrial mammals such as rodents and rabbits. Can catch bats and moths on the wing, but typically hunts by sallying from a tall perch.

Requires very large permanent territories in most habitats due to sparse prey densities. Monogamous pairs hunt over as much as 6000 hectares, with 2000 hectares being more typical in NSW habitats (DPIE 2021).

The habitat is not suitable for the Barking Owl, though it may forage in the area of the subject land from time to time and be an infrequent visitor but the removal of a few individuals of Cheese Tree will not affect the life-cycle or viability of populations of the Barking Owl in the locality.

## 4 POTENTIAL IMPACTS AND COMPLIANCE WITH DEVELOPMENT IN PITTWATER COUNCIL LGA

### 4.1 Introduction

Residential development must comply with Pittwater Council LEP (2014) and Pittwater Council 21 DCP (2014). This plan applies to all land within the Pittwater Council LGA to which LEP 2014 applies.

### 4.2 Pittwater Council LEP (2014)

Clause 7.6 refers to the following:

(1) The objective of this clause is to maintain terrestrial, riparian and aquatic biodiversity by: (a) protecting native fauna and flora, and (b) protecting the ecological processes necessary for their continued existence, and (c) encouraging the conservation and recovery of native fauna and flora and their habitats.

(2) This clause applies to land identified as “Biodiversity” on the Biodiversity Map. The land at 40 Sunrise Road, Palm Beach, is included in the overall marking of Biodiversity on the Council Biodiversity Map (current at 2021)

(3) The consent authority must consider: (a) whether the development is likely to have: (i) any adverse impact on the condition, ecological value and significance of the fauna and flora on the land,

**Comment:** The proposal to remove four small individual trees of Cheese Tree in fair condition from the highly structurally and floristically modified subject land, offset by replacement planting of at least 4 saplings of Cheese Tree and the area landscaped to 80% of representative species for Coastal Enriched Sandstone Dry Forest would be considered to maintain or enhance the condition, ecological value and habitat for flora and fauna at the subject land.

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

**Comment:** The proposal to remove four small individual trees of Cheese Tree in fair condition from the highly structurally and floristically modified subject land, offset by replacement planting of at least 4 saplings of Cheese Tree and the area landscaped to 80% of representative species for Coastal Enriched Sandstone Dry Forest, would be considered to maintain or enhance the condition, ecological value and habitat for fauna at the subject land.

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

**Comment:** The land is already highly modified, floristically, structurally and in functionality. The proposal to remove four small individual trees of Cheese Tree in fair condition from the highly structurally and floristically modified subject land, offset by replacement planting of at least 4 saplings of Cheese Tree and the area landscaped to 80% of representative species for Coastal Enriched Sandstone Dry Forest, would be considered to enhance the biodiversity structure, floristic composition and functionality of the ecological community occurring at the subject land.

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

**Comment:** The land is already highly modified, floristically, structurally and in functionality. The proposal to remove four small individual trees of Cheese Tree in fair condition from the highly structurally and floristically modified subject land, offset by replacement planting of at least 4 saplings of Cheese Tree and the area landscaped to 80% of representative species for Coastal Enriched Sandstone Dry Forest would be considered to enhance the habitat elements providing connectivity of the ecological community occurring at the subject land.

(3) The consent authority must consider whether (b) there any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

**Comment:** The land is already highly modified, floristically, structurally and in functionality. The proposal is to remove four small individual trees of Cheese Tree in fair condition (Scales 2020). The mitigation measure to offset this loss by replacement planting of at least 4 saplings of Cheese Tree in the rear yard and to landscape the rear yard to 80% of representative species for Coastal Enriched Sandstone Dry Forest, would be considered to mitigate the impacts of the proposed development.

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

(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or (b) if that impact cannot be reasonably avoided by adopting feasible alternatives—the development is designed, sited and will be managed to minimise that impact, or (c) if that impact cannot be minimised—the development will be managed to mitigate that impact.

It is considered that the removal of four individuals of Cheese Tree in only fair condition (Scales 2020) for the siting of the proposed dwelling at the upper sections of the subject land (Figures 5A, 5B & 6) would be adequately mitigated by the replacement planting of at

least 4 saplings of Cheese Tree in the rear yard and the rear yard landscaped to 80% of representative species for Coastal Enriched Sandstone Dry Forest, would be considered to adequately mitigate the impacts of the proposed development.

### **4.3 *Pittwater Council 21 DCP (2014)***

One of the aims of this DCP is to ensure that controls relating to biodiversity conservation and vegetation and wildlife management are undertaken when any development is proposed in areas containing natural bushland. The objective to maintain terrestrial biodiversity aims to ensure the following (Pittwater 21 DCP):

- protection of native fauna and flora,
- protection of ecological processes necessary to maintain their continued existence, and
- the encouragement of the conservation and recovery of native fauna and flora and their habitats.

This aim serves to protect and conserve the biodiversity of the local area through the retention of natural vegetation where applicable and to maintain, enhance and/or establish wildlife corridors that enable existing plant and animal communities to survive and potentially expand their range where possible (Pittwater Council 21 DCP 2014).

In regard to the proposed development, the location or positioning of the proposed dwelling house has taken account of the environmental constraints of the subject area and, as such, the building envelope has been located such that there is limited clearing and modification of natural bushland. The retention of elements of natural bushland should be encouraged wherever possible. The building layout would also take into account the effluent and water run-off disposal etc.

### **4.4 *Proposed impacts to floristic biodiversity***

#### **4.4.1 *Potential impacts of development***

The arboricultural impact assessment report by Scales (2020) lists a total of only 10 naturally occurring indigenous trees within the property and in close proximity, including 7 individuals of Cheese Tree.

The removal and replacement planting of four individuals of Cheese Tree in an area where the species is common in the immediate and extended locality, is not considered to substantially alter the already highly modified floristics, structure or functionality of the local Coastal Enriched Sandstone Dry Forest ecological community.

The understorey and ground stratum components have been cleared and highly modified and little impact will occur to most other native species on the land as these mainly located around the perimeter of the subject land.

#### ***4.4.2 Recommended mitigation measures***

The habitat of the remnant Coastal Enriched Sandstone Dry Forest is expected to be enhanced by the incorporation of a landscape plan for the rear of the property where all weed material would be removed from the site. The area would be planted with up to 80% of species that are representative of Coastal Enriched Sandstone Dry Forest. The extent of tree canopy would be enhanced on maturation of canopy species planted in the landscape plan.

### ***4.5 Compliance with Threatened Species Legislation***

#### ***4.5.1 Threatened species***

No individuals of threatened flora or fauna were recorded at or expected to occur at the subject site. Only four native trees are proposed for removal and the ecological community will be enhanced by the landscaping of the rear yard to 80% of species representative of Coastal Enriched Sandstone Dry Forest.

Any bush rock, hollow logs or dead trees should be left intact where possible as these provide safe refuge and shelter for many fauna species.

#### ***4.5.2 Threatened Ecological Community***

A highly degraded component of Coastal Enriched Sandstone Dry Forest with elements of Coastal Enriched Sandstone Moist Forest may occur as comprising the remnant elements of bushland retained at the subject site. These ecological communities are not listed as threatened on registers of the BC Act (2016) or EPBC Act (1999) (Figure 11).

### ***4.6 Compliance with Effluent and Stormwater Disposal***

The site would be serviced by sewage and storm water infrastructure.

### ***4.7 Conclusions***

With appropriate management of potential environmental constraints and the undertaking of effective mitigation measures as outlined in this report, the proposed development is considered to comply with the desired criteria in relation to Pittwater Council 21 DCP (2014).

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

### 5.1 Offset Scheme Thresholds

#### 5.1.1 Area criteria

The threshold for clearing above which the BAM and offsets apply is 1ha (BAM 2016). Of this 1ha area, if the area to be developed is >0.25ha then offsets apply (BAM 2016).

The property described as 40 Sunrise Road, Palm Beach, comprises an area of about 1,530m<sup>2</sup> (Figure 1).

The maximum area of potential natural bushland occurring at the subject site that is proposed to be impacted is estimated at about 845m<sup>2</sup> (or 0.085ha) (from Scales 2020).

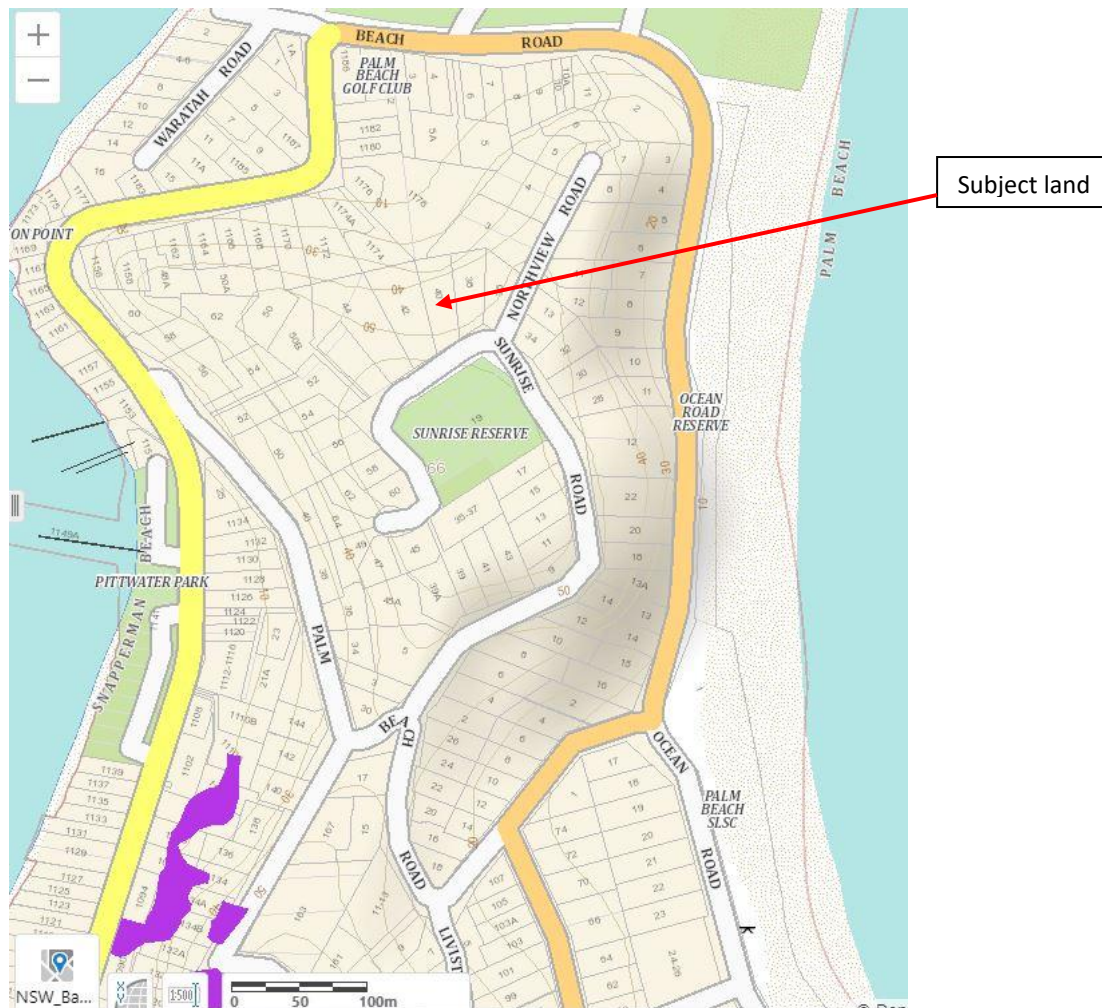
The development does not meet the offset criteria in relation to area to potentially be impacted.

#### 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 (DPIE 2020).

The location of the subject property on the Biodiversity Values Map is indicated in Figure 16.

The subject property is not indicated as containing any significant Biodiversity Value (Figure 16).



**Figure 16 - Biodiversity Values Mapping of subject site at 40 Sunrise Road, Palm Beach showing no biodiversity values mapped for the subject land (biodiversity values are indicated in purple shading if present such as patches of Coastal Escarpment Littoral Rainforest to the east of Barrenjoey Road near Snapperman Beach) (DPIE 2021).**

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

There are no threatened species of flora and/or fauna that would be impacted by the development.

The subject area occurs in a largely cleared, and highly floristically and structurally modified , former distribution of Coastal Enriched Sandstone Dry Forest. This ecological community is not listed on registers of either the BC Act (2016) or EPBC Act (1999).

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## Appendix 1: Floristic species assemblage recorded at 40 Sunrise Road, Palm Beach

<b>KEY</b>
<b>Status</b>
* Exotic species
HTW - High Threat Weed (DPIE 2021)
<b>Biosecurity Weeds</b> (Prohibition on dealing or Regional Recommended Measures) (DPI Priority Weeds for Greater Sydney 2021)
pl - Planted
<b>Vegetation</b>
Highly degraded and floristically, structurally and functionally modified vegetation of former assemblage of Coastal Enriched Sandstone Dry Forest with elements of Coastal Enriched Sandstone Moist Forest
<b>Relative cover value</b> (% cover) and where relevant, number of trees

STATUS	SCIENTIFIC NAME	COMMON NAME	UPSLOPE AREA (Figure 1)	DOWNSLOPE REAR YARD (Figure 1)
	<b>MAGNOLIOPSIDA: MAGNOLIDAE</b>			
	<b>Apocynaceae</b>			
*pl	<i>Nerium oleander</i>	Oleander	5	
*pl	<i>Plumeria acutifolia</i>	Frangipani	5	5
	<b>Asteraceae</b>			
*	<i>Cirsium vulgare</i>	Common Thistle		0.5
*	<i>Conyza sumatrensis</i>	Tall Fleabane	2	1
*	<i>Sonchus oleraceus</i>	Common Sowthistle	1	
*	<i>Vellereophyton dealbatum</i>	White Cudweed		1
	<b>Bignoniaceae</b>			
*pl	<i>Jacaranda mimosifolia</i>	Jacaranda		5
*pl	<i>Tecoma capensis</i>	Cape Honeysuckle	10	
	<b>Casuarinaceae</b>			
	<i>Casuarina glauca</i>	Swamp Oak	5	
	<b>Celastraceae</b>			
	<i>Maytenus silvestris</i>	Orangebark		2

STATUS	SCIENTIFIC NAME	COMMON NAME	UPSLOPE AREA (Figure 1)	DOWNSLOPE REAR YARD (Figure 1)
HTW	<b>Convolvulaceae</b> <i>Ipomoea indica</i>	Morning Glory	2	15
*	<b>Lauraceae</b> <i>Cinnamomum camphora</i>	Camphor Laurel		3 (seedlings)
*	<b>Malvaceae</b> <i>Sida rhombifolia</i>	Paddys Lucerne	3	
*pl	<b>Mimosaceae</b> <i>Acacia implexa</i> <i>Acacia podalyriifolia</i>	Hickory Wattle Queensland Silver Wattle	2	5
	<b>Moraceae</b> <i>Maclura cochinchinesis</i>	Cockspur Thorn		2
pl	<b>Myrtaceae</b> <i>Melaleuca quinquinervia</i>	Broad-leaved Paperbark	2 trees to 12m tall (15% cover)	8 trees to 14m tall (cover 35%)
HTW	<b>Ochnaceae</b> <i>Ochna serrulata</i>	Mickey Mouse Plant		2
*	<b>Oxalidaceae</b> <i>Oxalis corniculata</i>	Oxalis	5	
	<b>Phyllanthaceae</b> <i>Glochidion ferdinandi</i>	Cheese Tree		20
*pl	<b>Rosaceae</b> <i>Eriobotrya japonica</i>	Loquat		5
*	<b>Solanaceae</b> <i>Solanum nigrum</i>	Black Nightshade	3	3
Biosecurity Weed	<b>Verbenaceae</b> <i>Lantana camara</i>	Lantana		5
	<b>Vitaceae</b> <i>Cayratia clematidea</i>	Slender Grape	1	1

STATUS	SCIENTIFIC NAME	COMMON NAME	UPSLOPE AREA (Figure 1)	DOWNSLOPE REAR YARD (Figure 1)
Biosecurity Weed	<b>MAGNOLOPSIDA: LILIDAE</b>			
	<b>Asparagaceae</b> <i>Asparagus aethiopicus</i>	Asparagus Fern	3	2
	<b>Commelinaceae</b> <i>Commelina cyanea</i>	Scurvy Weed	3	7
	<b>Cyperaceae</b> <i>Cyperus laevis</i>		3	1
	<b>Doryanthaceae</b> pl <i>Doryanthes excelsa</i>	Gynea Lily	2	2
	<b>Poaceae</b>			
	* <i>Cynodon dactylon</i>	Couch	20	
	* <i>Ehrharta erecta</i>	African Veldt Grass	2	1
	* <i>Paspalum dilatatum</i>	Paspalum	2	
	* <i>Stenotaphrum secundatum</i>	Buffalo Grass	15	
	<b>Strelitzaceae</b> *pl <i>Strelitzia nicolai</i>	Wild Banana	5	10

#### LEGEND TO APPENDIX 1 - BIOSECURITY WEEDS IN NORTHERN BEACHES COUNCIL LGA

<a href="#">Ground Asparagus</a> <i>Asparagus aethiopicus</i>  <a href="#">Lantana</a> <i>Lantana camara</i>	<b>Prohibition on dealings</b> <i>Must not be imported into the State or sold</i>
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**Appendix 2: Plant species of conservation significance recorded within a 5km radius of the surveyed area since 2001 where potential habitat may occur (DPIE Bionet Atlas of NSW Wildlife 2021<sup>α</sup>) or where potential habitat is deemed to potentially occur (Commonwealth Environmental Reporting Tool 2021<sup>β</sup>)**

Scientific Name	Status (EPBC Act 1999)	Status (BC Act 2016)	RoTAP	Habit/potential habitat/general geographic location	Likelihood of occurrence in surveyed areas	Reference material derived from 'Final Determinations' (Scientific Committee) and others listed below:
<i>Asterolasia elegans</i> <sup>α,β</sup>	E*	E1	2ECa	Leafy shrub to 3m tall, occurring in moist gully habitat north of Maroota.	<b>Unlikely</b> - All records occur in Brisbane Water National Park, west of Pearl Beach (Figure 12). Absence of relatively distinct life-form individuals in defined area of study deemed to indicate non-occurrence. <b>No further assessment required</b>	Robinson (1991); DPIE Atlas of NSW Wildlife (2021); Fairley (2004)
<i>Callistemon linearifolius</i> <sup>α</sup>		V	2RCi	Erect shrub to 2.5m tall. Occurs in damp situations in woodland or scrub on sandstone substrates	<b>Unlikely</b> - Nearest records about 3km to the south-east at North Avalon headland and at West Head (Figure 11). Absence of conspicuous large-life form individuals indicate non-occurrence. <b>No further assessment required.</b>	DPIE Atlas of NSW Wildlife (2021); Robinson (2000), James <i>et al</i> (1999)
<i>Grevillea shiressii</i> <sup>α β</sup>		V	3RC-	Large spreading shrub 1- 3m tall. Occurs on creek banks in alluvium below tall forest dominated by <i>Eucalyptus deanei</i> . Occurs in northern catchment of Hawkesbury River along Mooney Mooney Creek and Mullet Creek around Wondabyne.	<b>Highly unlikely</b> - Habitat unsuitable. Nearest record for this species occurs near Pearl Beach on the Central Coast. Absence of conspicuous large-life form individuals indicate non-occurrence. <b>No further assessment required</b>	DPIE Atlas of NSW Wildlife (2021), Robinson (2000), Fairley (2004).

Scientific Name	Status (EPBC Act 1999)	Status (BC Act 2016)	RoTAP	Habit/potential habitat/general geographic location	Likelihood of occurrence in surveyed areas	Reference material derived from 'Final Determinations' (Scientific Committee) and others listed below:
<i>Persoonia hirsuta</i> subsp <i>hirsuta</i> <sup>α β</sup>	E*	E1	3KCi	Spreading to decumbent shrub found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone.	<b>Unlikely</b> –A total of 3 records have been listed to the west of the study area, all in Ku-ring-gai Chase NP. The absence of relatively distinct large life-form individuals in area of study indicates non-occurrence. <b>No further assessment required</b>	DPIE Atlas Of NSW Wildlife (2021); James et al (1999); Fairley & Moore (2000); Fairley (2004).
<i>Rhodamnia rubescens</i> <sup>α</sup>		E4A		Shrub or small tree to 25 m high with reddish/brown, fissured bark (OEH 2019). Occurs in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils (OEH 2019).	<b>Unlikely</b> – Habitat unsuitable. Nearest records occur to the south-west in Ku-ring-gai National Park about 3km from the subject site (DPIE 2020).  The natural habitat of the subject site is cleared and highly structurally and floristically modified and degraded, however, the survey targeted this species of conservation significance but no individuals were found to occur in the surveyed area and the absence of relatively distinct large life-form individuals in area of study indicates non-occurrence.. <b>No further assessment required.</b>	DPIE Bionet Atlas of NSW Wildlife (2021)
<i>Syzygium paniculatum</i> <sup>α β</sup>	V*	V	3VCi	Shrub or small tree to 8m tall, occurs in or near rainforest from littoral sands to sheltered gullies, especially near watercourses on sandy soils	<b>Unlikely</b> – Habitat not suitable. Records likely indicate numerous landscape plantings to the south of the subject site. The absence of conspicuous large-life form individuals of this species indicates non-occurrence. <b>No further assessment required.</b>	DPIE Atlas of NSW Wildlife (2021); Robinson (1991), Fairley & Moore (2000)

**Key to Conservation Status:**

**Commonwealth legislation**

Environmental Protection and Biodiversity Conservation Act, 1999

EX – Presumed extinct

E\* - Endangered

V\* - Vulnerable

**NSW legislation**

Biodiversity Conservation Act, 2016

E4A – Schedule 1 Part 1 – Presumed extinct, recently recorded

E1 Schedule 1 Part 1 – Endangered

V Schedule 2 - Vulnerable

**RoTAP**

Conservation code

2 - geographic range <100km

3 - geographic range >100km

Conservation status

E - endangered to point of extinction if current land use and other threats continue to operate

V - vulnerable, at risk of depletion over 20-50- years if land use that threatens survival is maintained

C - at least one population conserved in a national park or proclaimed conservation area

Size class of reserved populations

a - >1000 plants in conservation reserve

i - < 1000 plants in conservation reserve

- reserved population size not accurately known

**Appendix 3 - Likelihood of occurrence of some fauna species of conservation significance recorded within a 5km radius of the Study Area at 40 Sunrise Road, Palm Beach (DPIE Bionet Atlas of NSW Wildlife 2021) or where potential habitat is deemed to potentially occur (DAWE 2021).**

<i>Amphibians</i>	BC Act	EPBC Act	Habitat	Record (source)	Likelihood of Occurrence	Assessment of Significance required
<b>Red-crowned Toadlet</b> <i>Pseudophryne australis</i>	V		Occurs in open forests, mostly on Hawkesbury and Narrabeen Sandstones at the sandstone-shale interface. Inhabits periodically wet drainage lines below sandstone ridges that often have shale lenses. Shelters under rocks and amongst masses of dense vegetation or thick piles of leaf litter.	48 DPIE Bionet Atlas (2021)	<b>Highly unlikely</b> - habitat highly modified; no suitable habitat on the subject land.	No
<b>Giant Burrowing Frog</b> <i>Heleioporus australiacus</i>	V	V	<b>Distribution;</b> The Giant Burrowing Frog occurs from the NSW Central Coast to eastern Victoria, but is most common on the Sydney sandstone. It has been found from the coast to the Great Dividing Range. <b>Habitat;</b> Found in heath, woodland and open forest with sandy soils. Generally lives in the heath or forest and will travel several hundred metres to creeks to breed. Burrows into deep litter or loose soil, emerging to feed or breed after rain. <b>Breeding;</b> Breeds from August to March and the eggs are laid in a white foam-mass under vegetation in creeks or in yabby holes. <b>Feeding;</b> Diet includes ground-dwelling invertebrates such as ants, beetles and spiders.	79 DPIE Bionet Atlas (2021)	<b>Highly unlikely</b> - habitat highly modified; no suitable habitat on the subject land.	No
<i>Birds</i>	BC Act	EPBC Act	Habitat	No sighted (source)	Likelihood of Occurrence	Assessment of Significance required
<b>Rose-crowned Fruit Dove</b> <i>Ptilinopus regina</i>	V		Occurs mainly in sub-tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful. They are shy pigeons, not easy to see amongst the foliage, and are more often heard than seen. They feed entirely on fruit from vines, shrubs, large trees and palms, and are thought to be locally nomadic as they follow the ripening of fruits.	1 DPIE Bionet Atlas (2021)	<b>Highly unlikely</b> - habitat highly modified; no suitable habitat on the subject land and habitat of PSGF would not be impacted by proposal.	No

Birds	BC Act	EPBC Act	Habitat	No sighted (source)	Likelihood of Occurrence	Assessment of Significance required
<b>White-bellied Sea-Eagle</b> <i>Haliaeetus leucogaster</i>	V	C	Low potential for habitat to occur at site. Occurs in wooded areas near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest. May overfly site on occasion.	26 DPIE Bionet Atlas (2021)	<b>Low</b> - May overfly the area as part of a wider foraging range	No
<b>Little Eagle</b> <i>Hieraaetus morphnoides</i>	V		The Little Eagle is seen over woodland and forested lands and open country, extending into the arid zone. It tends to avoid rainforest and heavy forest. The Little Eagle searches for prey on the wing or from a high exposed perch, taking prey from the ground, the shrub layer or the canopy. Prey includes rabbits, other live mammals and insects. <i>May overfly the area as part of a wider foraging range but will not be affected by the development.</i>	1 OEH Bionet Atlas (2021)	<b>Low - Moderate</b> - May overfly the area as part of a wider foraging range	No
<b>Bush Stone-curlew</b> <i>Burhinus grallarius</i>	V		The Bush Stone Curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east it is either rare or extinct throughout its former range.  Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber. Largely nocturnal, being especially active on moonlit nights. Feed on insects and small vertebrates, such as frogs, lizards and snakes. Nest on the ground in a scrape or small bare patch.	35 DPIE Bionet Atlas (2021)	<b>Low</b> -Sightings centred around Careel Bay, Avalon and Newport (Figure 14). Nearest record about 670m to south of subject site. Small extent of clearing of weed-infested Coastal Foreshores Sandstone Forest considered not to impact on habitat of this species.	No
Birds	BC Act	EPBC Act	Habitat	No sighted (source)	Likelihood of Occurrence	Assessment of Significance required
<b>Glossy Black Cockatoo</b> <i>Calyptorhynchus lathami</i>	V		Inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1000 m in which stands of sheoak species, particularly Black She-oak ( <i>Allocasuarina littoralis</i> ), Forest She-oak ( <i>A. torulosa</i> ) or Drooping She-oak ( <i>A. verticillata</i> ) occur. Forest She-oak is the preferred foraging resource. Roosts in	28 DPIE Bionet Atlas (2021)	<b>Low</b> -no suitable habitat on the subject land.	No

			<p>the canopy of tall trees, occasionally in tree hollows. Nests in deep hollows in eucalypts.</p> <p><i>No individuals of Allocasuarina littoralis occur at the subject site and none will be removed. As no Glossy Black-cockatoos were recorded and no chewed cones or evidence of feeding was noted, the likelihood of this species being impacted by the development is unlikely</i></p>			
<p><b>Little Lorikeet</b> <i>Glossopsitta pusilla</i></p>	V		<p>Little Lorikeets mostly occur in dry, open eucalypt forests and woodlands. They have been recorded from both old-growth and logged forests in the eastern part of their range, and in remnant woodland patches and roadside vegetation on the western slopes.</p> <p>Little lorikeets are considered to be nomadic, likely in a response to food availability. These lorikeets usually forage in small flocks, feeding mainly on nectar and pollen, but also fruit of eucalypts, melaleucas and mistletoes. The little lorikeet breeds from May to September, nesting in tree hollows, with small diameter entrance holes. Most breeding records are located on the western slopes.</p> <p><i>May forage in the subject site with other species of lorikeets during peak flowering events.</i></p>	<p>1 DPIE Atlas of NSW Wildlife (2021)</p>	<p><b>Low</b> - more likely to occur within Garigal and Ku-ring-gai Chase National Parks where there is undisturbed forested areas overlooking gully vegetation.</p>	No
<p><b>Swift Parrot</b> <i>Lathamus discolor</i></p>	E1	CE	<p>Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south west slopes. Migrates to the Australian south-east mainland between March and October. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany <i>Eucalyptus robusta</i>, Spotted Gum <i>Corymbia maculata</i>, Red Bloodwood <i>C. gummifera</i>, Mugga Ironbark <i>E. sideroxylon</i>, and White Box <i>E. albens</i>.</p>	<p>2 DPIE Bionet Atlas (2021)</p>	<p><b>Low</b> - habitat unsuitable</p>	No

Birds	BC Act	EPBC Act	Habitat	No sighted (source)	Likelihood of Occurrence	Assessment of Significance required
<b>Turquoise Parrot</b> <i>Neophema pulchella</i>	V		<p>Range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range.</p> <p>Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland.</p> <p>Usually seen in pairs or small, possibly family, groups and have also been reported in flocks of up to thirty individuals.</p> <p>Prefers to feed in the shade of a tree and spends most of the day on the ground searching for the seeds or grasses and herbaceous plants, or browsing on vegetable matter.</p> <p>Forages quietly and may be quite tolerant of disturbance.</p> <p>However, if flushed it will fly to a nearby tree and then return to the ground to browse as soon as the danger has passed.</p> <p>Nests in tree hollows, logs or posts, from August to December.</p> <p>It lays four or five white, rounded eggs on a nest of decayed wood dust.</p>	1 DPIE Atlas of NSW Wildlife (2021)	<b>Low</b> - Habitat suboptimal, proposed development considered not to impact on habitat of this species.	No
<b>Barking Owl</b> <i>Ninox connivens</i>	V		Inhabits eucalypt woodland, open forest, swamp woodlands and, especially in inland areas, timber along watercourses. Dense vegetation is used occasionally for roosting. During the day they roost along creek lines, usually in tall understorey trees with dense foliage such as <i>Acacia</i> and <i>Casuarina</i> species, or the dense clumps of canopy leaves in large <i>Eucalypts</i> . Live alone or in pairs. Territories range from 30 to 200 hectares and birds are present all year (Debus 1997).	6 DPIE Bionet Atlas (2021)	<b>Low - Moderate</b> - Habitat highly modified. Recorded about 0.75km to the south. Even if occurs occasionally in modified bushland at rear of property, then no impact on habitat of this species	No
<b>Powerful Owl</b> <i>Ninox strenua</i>	V		Inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. It roosts by day in dense vegetation comprising species such as Turpentine <i>Syncarpia glomulifera</i> , Black She-oak <i>Allocasuarina littoralis</i> , Blackwood <i>Acacia melanoxylon</i> , Rough-barked Apple	138 DPIE Bionet Atlas (2021)	<b>Low</b> - more likely to occur within tracts of nearby forest where there are large areas of undisturbed bushland.	No

			<i>Angophora floribunda</i> , Cherry Ballart <i>Exocarpus cupressiformis</i> and a number of other eucalypt species. <i>No evidence (presence of pellets or droppings at base of trees or on tree trunks) of this species using the subject site for roosting. The subject site is not regarded as core habitat for Powerful Owl.</i>			
<b>Birds</b>	<b>BC Act</b>	<b>EPBC Act</b>	<b>Habitat</b>	<b>No sighted (source)</b>	<b>Likelihood of Occurrence</b>	<b>Assessment of Significance required</b>
<b>Masked Owl</b> <i>Tyto novahollandiae</i>	V		<p>Extends from the coast where it is most abundant to the western plains. Overall records for this species fall within approximately 90% of NSW, excluding the most arid north-western corner. There is no seasonal variation in its distribution. Lives in dry eucalypt forests and woodlands from sea level to 1100 m.</p> <p>A forest owl, but often hunts along the edges of forests, including roadsides. The typical diet consists of tree-dwelling and ground mammals, especially rats.</p> <p>Pairs have a large home-range of 500 to 1000 hectares. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.</p>	3 DPIE Bionet Atlas (2021)	<b>Low</b> - highly modified habitat unsuitable. Nearest record is about 2km to the north at Barrenjoey Head	No
<b>Eastern Bristlebird</b> <i>Dasyomis brachypterus</i>	E1	E	Distribution of this species has contracted to three disjunct areas of south-eastern Australia. There are three main populations: Northern - southern Queensland/northern NSW, Central - Barren Ground NR, Budderoo NR, Woronora Plateau, Jervis Bay NP, Booderee NP and Beecroft Peninsula and Southern - Nadgee NR and Croajingalong NP in the vicinity of the NSW/Victorian border. The estimated population size is less than 2000 individuals occupying a total area of about 120 sq km. The central population comprises an estimated 1600 birds, mainly from Barren Grounds Nature Reserve, Budderoo National Park and the Jervis Bay area. The southern population in Nadgee Nature Reserve and Howe's Flat is around 200 birds. Further surveys are required in parts of Ben Boyd National Park and Sydney Catchment Authority lands to determine whether further populations of the Eastern Bristlebird occur in these	1 DPIE Bionet Atlas (2021)	<b>Low</b> - more likely to occur within tracts of undisturbed bushland. Much of the woodland vegetation at the subject site is highly modified and unsuitable habitat.	No

			<p>areas.</p> <p>Habitat for central and southern populations is characterised by dense, low vegetation including heath and open woodland with a heathy understorey.</p> <p>Age of habitat since fires (fire-age) is of paramount importance to this species. The Illawarra and southern populations reach maximum densities in habitat that has not been burnt for at least 15 years; however, habitat in northern NSW requires frequent fires to maintain habitat condition and suitability. The northern fire regimes is between 3-6 years and of variable intensity depending on the habitat condition.</p> <p>Shy and cryptic and rarely flies, although can be seen scampering over the ground; when approached, may move to a lookout perch 1 m or more above the ground, then retreat into dense vegetation.</p> <p>Feeds on a variety of insects, particularly ants.</p>			
<b>Dusky Woodswallow</b> <i>Artamus cyanopterus cyanopterus</i>	V		<p>inhabits dry, open eucalypt forests and woodlands, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. Primarily eats invertebrates, mainly insects, which are captured whilst hovering or sallying above or under the canopy, primarily over leaf litter and dead timber. Also occasionally take nectar, fruit and seed. Depending on location and local climatic conditions (primarily temperature and rainfall), the dusky woodswallow can be resident year round or migratory. Nest sites may be exposed or well concealed by foliage (OEH 2019). <i>The proposed development is not expected to impact on the foraging activity of this species.</i></p>	<p>1 DPIE Atlas of NSW Wildlife (2021)</p>	<p><b>Low-</b> more likely to occur within Garigal and Ku-ring-gai Chase National Park where there are large areas of undisturbed forest.</p>	<p>No</p>
<b>Scarlet Robin</b> <i>Petroica boodang</i>	V		<p>Foraging habitat at site surrounded by urbanisation has a low potential, the species inhabiting dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. Low suitability for roosting at site surrounded by urbanisation. Prefers abundant logs and fallen timber which do not occur at the subject site.</p> <p>Low suitability for breeding, prefers ridges in dry eucalypt</p>	<p>1 DPIE Atlas of NSW Wildlife (2021)</p>	<p><b>Low</b> - more likely to occur where there are large areas of undisturbed forest.</p>	<p>No</p>

			forest and woodland which do not occur at the site which is surrounded by urbanisation. <i>Not optimal habitat for the Scarlet Robin. The proposed development should not impact on the foraging activity of this species.</i>			
<b>Mammals</b>	<b>BC Act</b>	<b>EPBC Act</b>	<b>Habitat</b>	<b>No sighted (source)</b>	<b>Likelihood of Occurrence</b>	<b>Assessment of Significance required</b>
<b>Spotted-tailed Quoll</b> <i>Dasyurus maculatus</i>	V	E	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 (Edgar & Belcher 1995).	9 DPIE Atlas of NSW Wildlife (2021)	<b>Highly unlikely</b> - all records to the west in Ku-ring-gai Chase National Park. Habitat highly structurally and floristically modified; no suitable habitat on the subject land.	No
<b>Southern Brown Bandicoot</b> <i>Isodon obesulus obesulus</i>	E1	E	The Southern Brown Bandicoot has a patchy distribution. In south-eastern NSW, found east of the Great Dividing Range south from the Hawkesbury River. Southern Brown Bandicoots are largely crepuscular (active mainly after dusk and/or before dawn). They are generally only found in heath or open forest with an understorey on sandy or friable soils.	1 Bionet Atlas of NSW Wildlife (2020)	<b>Unlikely</b> - Habitat considered unsuitable. Nearest record some 3km to the south at Avalon Beach. Most records occur in Ku-ring-gai National Park to the north-west of the subject site	No
<b>Koala</b> <i>Phascolarctus cinereus</i>	V	V	Occurs in natural eucalypt forests and woodlands. Koala feed trees listed under Schedule 2 of SEPP 44 legislation include: Forest red gum <i>Eucalyptus tereticornis</i> ; Tallowwood, <i>Eucalyptus microcorys</i> ; Grey Gum, <i>Eucalyptus punctata</i> ; Manna Gum, <i>Eucalyptus viminalis</i> ; River Red Gum, <i>Eucalyptus camaldulensis</i> ; Broad leaved scribbly gum, <i>Eucalyptus haemastoma</i> ; Scribbly gum, <i>Eucalyptus signata</i> ; White box, <i>Eucalyptus albens</i> ; Bimble box, <i>Eucalyptus populnea</i> and Swamp mahogany, <i>Eucalyptus robusta</i> .  <i>On the subject land there are no primary food trees, so the land does not represent optimal Koala habitat.</i>	26 DPIE Atlas of NSW Wildlife (2020)	<b>Highly unlikely</b> - habitat highly structurally and floristically modified; no suitable habitat on the subject land. Most records in Brisbane Waters National Park with single record to the south at Clareville	No

Mammals	BC Act	EPBC Act	Habitat	No sighted (source)	Likelihood of Occurrence	Assessment of Significance required
<b>Eastern Pygmy Possum</b>  <i>Cercartetus nanus</i>	V		<p>The species is widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria (Menkhorst &amp; Knight 2001). It inhabits forests and woodlands with an overstorey of winter-flowering eucalypts (<i>Corymbia maculata</i>, <i>Eucalyptus robusta</i>, <i>Eucalyptus tereticornis</i>) or an understorey of winter-flowering Banksia (<i>Banksia spinulosa</i>) or pinnate-leaved Acacias (<i>Acacia irrorata</i>). The highest estimated numbers occur in association with Scribbly Gum (<i>Eucalyptus haemastoma</i>), Smooth-barked Apple (<i>Angophora costata</i>) Red Bloodwood (<i>Corymbia gummifera</i>) with an understorey of <i>Banksia spp.</i> and <i>Xanthorrhoea spp.</i> (Smith &amp; Murray 2003) Squirrel Gliders require abundant tree hollows for refuge and nest sites. Diet varies seasonally and consists of Acacia gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein (Menkhorst &amp; Collier 1987, Gibbons &amp; Lindenmayer 2002).</p>	6 DPIE Atlas of NSW Wildlife (2020)	<b>Highly unlikely</b> - habitat highly structurally and floristically modified; no suitable habitat on the subject land.	No
<b>Squirrel Glider</b>  <i>Petaurus norfolcensis</i>	V		<p><b>Distribution;</b> The species is widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria. Within Sydney the species is only known on the Barrenjoey Peninsula and in the Kurrajong-Wilberforce area  <b>Habitat;</b> Inhabits dry sclerophyll forests and woodlands but is generally absent from rainforests and closed forests (Menkhorst and Collier 1988). Their coastal habitats range from low, scrubby eucalypt woodlands and banksia thickets to tall, wet eucalypt forests bordering on rainforest (Lindenmayer 2002). In coastal New South Wales they typically inhabit areas with a diversity of tree and shrub species, including high nectar-producing species and winter-flowering Species.  <b>Breeding;</b> Births may occur throughout the year, usually with peak in winter. Most females exhibit the capacity to raise two litters per year. Young gliders disperse at a mean age of 12.5 months.  <b>Feeding;</b> Diet consists of sap from wattle and eucalypt trees, invertebrates, nectar and pollen. (Lindenmayer 2002). During</p>	1 DPIE Bionet Atlas (2020)	<b>Low</b> - Subject site is highly modified. Foraging source within the property for the Squirrel Glider are insects. No foraging activity recorded. Nearest record about to the south-west at Avalon.	No

			winter when other food sources are scarce the Squirrel Glider may obtain its energy from winter flowers of a number of plant species. Favoured within the Pittwater area is Coastal Banksia, Old Man Banksia, Grey Ironbark, Red bloodwood, Spotted Gum and Sydney Red Gum.			
<b>Mammals</b>	<b>BC Act</b>	<b>EPBC Act</b>	<b>Habitat</b>	<b>No sighted (source)</b>	<b>Likelihood of Occurrence</b>	<b>Assessment of Significance required</b>
<b>Grey-headed Flying-fox</b> <i>Pteropus poliocephalus</i>	V	V	Grey-headed Flying Fox ( <i>Pteropus poliocephalus</i> ). This species congregates in large camps and is found in a variety of habitats including rainforest, mangroves, Melaleuca swamps, wet and dry sclerophyll forests and also cultivated areas. The species feeds on the blossoms of more than 80 plant species, especially eucalyptus blossom and the fruits of a number of palm species. Flowering species of eucalypts such as Swamp Mahogany ( <i>Eucalyptus robusta</i> ) and Forest Red Gum ( <i>Eucalyptus tereticornis</i> ) and Paperbarks ( <i>Melaleuca quinquenervia</i> ), are particularly important. Distances of up to 30km from the camp are often travelled, with 60-70km sometimes covered per night to reach a particular food source. The Grey-headed Flying Fox ( <i>Pteropus poliocephalus</i> ) was not sighted during the survey, which occurred during mid-morning when the bats would be roosting in camps, but may be attracted to flowering Eucalyptus trees on occasion.	46 DPIE Bionet Atlas (2020)	<b>Low - Moderate-</b> May on occasion forage in the area as part of a wider foraging range in the locality. May utilise Broad-leaved Paperbark for foraging when in flower. Most Paperbark trees will be retained. The proposed development will not impact on the Grey-headed Flying Fox.	No
<b>Eastern Coastal Freetail Bat</b> <i>Mormopterus norfolkensis</i>	V		Occur in dry sclerophyll forest and woodland east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures. Insectivorous.	3 DPIE Bionet Atlas (2021)	<b>Low</b> - Subject site is highly modified and may on occasion forage above the tree canopy for insects. Development will not impact on this species	No

<i>Mammals</i>	BC Act	EPBC Act	Habitat	No sighted (source)	Likelihood of Occurrence	Assessment of Significance required
<b>Large-eared Pied Bat</b> <i>Chalinobus dwyeri</i>	V	V	These bats roost in shallow caves in escarpments, particularly in sandstone and forage in remnant native dry and wet open forests, woodlands and rainforests.	6 DPIE Bionet Atlas (2021)	<b>Low</b> - May on occasion forage in the area as part of a wider foraging range. It is considered that species will not be compromised by the proposed development at the subject site (DPIE 2021).	No
<b>Eastern Cave Bat</b> <i>Vespadelus troughtoni</i>	V		<p>This bat species is found in a broad band on both sides of the Great Dividing Range from Cape York to Kempsey, with records from the New England Tablelands and the upper north coast of NSW. The western limit appears to be the Warrumbungle Range, and there is a single record from southern NSW, east of the ACT.</p> <p>Very little is known about the biology of this uncommon species. 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.</p> <p>Occasionally found along cliff-lines in wet eucalypt forest and rainforest.</p> <p>Little is understood of its feeding or breeding requirements or behaviour</p>	3 DPIE Bionet Atlas (2021)	<b>Low</b> -Appears to occur mainly in upper North Coast of NSW, habitat appears unsuitable. Proposed development will not impact on this species.	No
<b>Little Bentwing Bat</b> <i>Miniopterus australis</i>	V		Habitat in moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and at night forage for small insects beneath the canopy of densely vegetated habitats.	20 DPIE Bionet Atlas (2021)	<b>Low</b> -Unsuitable foraging habitat on the subject land	No

<i>Mammals</i>	BC Act	EPBC Act	Habitat	No sighted (source)	Likelihood of Occurrence	Assessment of Significance required
<b>Large Bentwing Bat</b> <i>Miniopterus orianae oceanensis</i>	V		<p>This sub species of Bentwing Bat occurs from Cape York to central Vic. Occurs in wet and dry sclerophyll forests and rainforests. Roost within man-made structures. Known roost sites include caves, disused mines, storm-water drains, culverts and buildings. However maternity roosts occur in sandstone or limestone cave systems. Will form scattered smaller colonies, mostly within 300km of the larger maternity cave (Churchill 1998).</p> <p>Active all year round, foraging mostly on moths above the tree canopy. Feeds over large areas of land and has been reported to travel up to 70 km in one night (Dwyer 1995)</p> <p><i>The Eastern Bentwing Bat will not be impacted upon by the proposed development.</i></p>	24 DPIE Bionet Atlas (2021)	<b>Moderate</b> -not optimal foraging habitat on the subject land but may overfly the area on occasion to forage. Nearest record about 2km to the south. Proposed development will not impact on this species.	No
<i>Mammals</i>	BC Act	EPBC Act	Habitat	No sighted (source)	Likelihood of Occurrence	Assessment of Significance required
<b>Southern Myotis</b> <i>Myotis macropus</i>	V		<p>Prefers permanent and/or flowing water. The Southern Myotis is commonly a cave dwelling microchiropteran, but will utilise tree hollows, mines, stormwater drains, bridges and dense vegetation (Churchill 1998). Roosting sites can be located within a wide variety of habitats, usually located in close proximity to permanent, slow flowing water. Breeding occurs between November and December, with young being weaned after three to four weeks (Churchill 1998).</p> <p>The Southern Myotis commonly forages over water bodies for insects and small fish (Churchill 1998).</p>	4 DPIE Bionet Atlas (2021)	<b>Low</b> -no foraging habitat on the subject land	No
<b>Greater Broadnose Bat</b> <i>Scoteanax ruepellii</i>	V		<p>The preferred foraging habitat of this species appears to be tree-lined creeks and the interface between forested land and cleared areas. This species usually roosts in tree hollows, with large live or dead emergent hollow bearing trees preferred. The roof spaces of old buildings are also used as roost sites.</p>	3 DPIE Atlas of NSW Wildlife (2021)	<b>Low</b> -- Habitat of degraded cleared site unsuitable. May on occasion forage at the subject site as part of a	No

			The Greater Broad-nosed Bat has been observed to travel from a forested foraging area, several kilometres to a roost tree hollow adjacent to the edge of a town. A colony of up to 80 individuals was using the roost. Large, individual paddock trees have also been found to be used by this species. This indicates that an individual tree may be extremely important, at least on a seasonal basis.		wider foraging range. It is not expected that the Greater Broadnose Bat will be impacted upon by the proposed development.	
<i>Reptiles</i>	<b>BC Act</b>	<b>EPBC Act</b>	<b>Habitat</b>	<b>No sighted (source)</b>	<b>Likelihood of Occurrence</b>	<b>Assessment of Significance required</b>
<b>Rosenberg's Goanna</b> <i>Varanus rosenbergi</i>	V		Found in heath, open forest and woodland. Shelters in hollow logs, rock crevices and in burrows, which they may dig for themselves, or they may use other species' burrows, such as rabbit warrens. Runs along the ground when pursued (as opposed to the Lace Monitor, which climbs trees (Cogger 2000).	3 DPIE Bionet Atlas (2021)	<b>Highly unlikely</b> - habitat highly modified; unlikely to occur in this habitat. All records to the west in Ku-ring-gai Chase National Park.	No

