Flora and Fauna Assessment

for

Alterations and additions

at

255 Whale Beach Rd, Whale Beach

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Table of Contents

List of Maps

List of Tables

List of Photos

Introduction

1.1 Background

This report describes the ecological values and constraints at the Study Site, Lot 170 in DP 15376, which is also known as 255 Whale Beach Road, Whale Beach.

Native and exotic, plant and animal species present on the site were recorded. The types of vegetation present on the site were classified into Plant Community types, and their distribution and abundance on the site were mapped. The history of disturbance was determined and is described. Threatened flora and fauna species and Threatened Ecological Communities that have suitable habitat on the site were targeted during the field survey.

The likely impacts of the proposed development on terrestrial biodiversity was then assessed as required by Federal, State and Local Government legislation.

Ways to avoided and minimised the impact were discussed with the developer. Recommendations to further ameliorate ecological impacts are included in this report.

This method of describing the ecological values is required when submitting development applications to allow assessment of the application with respect to the; *Environmental Planning and Assessment Act 1979*, the *Biodiversity Conservation Act 2016* and the Federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999) and other applicable Acts, Policies, Regulations, SEPPs, LEPs, and DCPs.

1.1 Aims of this Report

The aims of this flora and fauna assessment are to:

- Record the **findings of an ecological survey** that describes the flora, fauna and ecological communities and their habitats of the site and surrounding land and the likely impacts the proposal;
- Describe the **importance of the habitat** on the site to the conservation of native flora and fauna, including fauna not found during the survey.
- Determine the ecological **constraints** of the site and provide advice to the applicant on ways the impact can be **avoided** and **minimised** before finalising the proposal plans as required by the mitigation hierarchy of the Biodiversity Conservation Act 2016;
- **Assess** the likely **ecological impact** of the proposal (as described in this report) on the ecological values of the site in particular the significance of the impact to Threatened species, populations and ecological communities or their habitats in accordance with the requirements of the *Environment Planning and Assessment Act* (EP&A Act) Sections 4.15(1) a, b and c, the *Biodiversity Conservation Act 2016* (including threshold test and 5-Part assessment of Significance) and determination of compliance with other relevant NSW legislation including; Acts, regulations SEPPs, LEP and DCPs;
- Determine if the proposal triggers the **BOS threshold test** as required by the *Biodiversity Conservation Act 2016*, which would require the application of the Biodiversity Assessment Method (BAM) and a BDAR assessment;
- Determine if the proposal needs a **referral** to the Federal government for assessment under the EPBC Act;
- Recommend ways the **ecological impacts** can be further **ameliorated** and management actions during construction and for the life of the development.

1.2 Ecologically Relevant Legislation

The ecological legislation relevant to this proposal is determined in Table 1 and the relevant legislation and their requirements are discussed in section 1.3.

Table 1: Ecological Legislation Assessment

Legislation/Policy	Triggers	Requirement	Assessment Requirements	How Addressed
Environment Planning and Assessment Act 1979	This proposal is a Part 4 Local Development Application.	Yes	Triggers other State and Local legislation and section 4.15 to be assessed.	Addressed by this report and in the conclusions in section 5. Heads of Consideration 4.15 parts a, b, and c
Biodiversity Conservation Act 2016 (BC Act)	Threshold Test, 5-part tests of significance s7.3 and prescribed Impacts assessment required for all part 4 DAs. These are triggers for entry into BOS.	Yes But BAM assessment not required.	Threshold Test, 5-part tests of significance. Avoid and minimise impacts.	5-part Test of Significance in Appendix A of this report. BAM Threshold test section 3.9. Entry into BOS not required.
Local land Services Act 2013 (LLS Act)	Mapped on the Native Vegetation Regulatory Map	No, not mapped		
Vegetation in Non-Rural Areas SEPP	Clearing of vegetation when there is no DA.	No		
SEPP 19 - Bushland in Urban areas (section 9)	Impact to Land adjacent to Public Open Space	No		
Water Management Act 2000	Controlled activity on waterfront land and more than one dwelling.	No		
Fisheries Management Act 1994 (FM Act)	Impact to marine vegetation or Threatened species listed in the FM Act.	No		
Coastal Management SEPP 2018	Mapped on Littoral Rainforest & Coastal Wetlands Map	Yes		Addressed in Planning report
Biosecurity Act 2015 (Bio Act)	Priority weeds of environmental weeds at the site.	Yes	All Weeds are identified in Plant species list table.	All weeds are identified and classified.
Koala Habitat Protection SEPP 2019	Evidence of viable Koala population in the locality, property more than 1ha.	No property less than 1ha		
Local Council LEP and DCP	LEP/DCP Mapping	Yes	LEP and DCP addressed by this report	Addressed by this report
Federal Environment Protection and Biodiversity Conservation Act 1999	Actions not likely to meet criteria	No		

1.3 Legislation Addressed by This Report

1.3.1 Environment Planning and Assessment Act 1979

The NSW Environment Planning and Assessment Act 1979 is the framework for approval of development in NSW. The proposed development will be assessed under Part 4 of the NSW Environmental Planning and Assessment Act. Section 4.15 (a) of the Act requires that consent authorities must take into consideration any environmental planning instruments, LEP, DCP, SEPPs and regulations. Section 4.15 (c) requires assessment of the suitability of the land for development.

Section 4.15 (b)) requires the assessment of the likely impacts of a development, including environmental impacts on both the natural and built environments including the BC Act threshold test and if necessary, a BAM assessment and any required offsetting.

1.3.2 Biodiversity Conservation Act 2016

The primary requirement of the BC Act is that ecological impact is to be Avoided and Minimised and the remaining impact is to be offset according to the BAM/BOS scheme.

This act lists the Threatened flora and fauna species and defines the ecological communities in NSW and the regulation for the Act requires that a threshold test be applied to Development Applications. An assessment of significance is required to be undertaken for all Threatened species or ecological communities that may have suitable habitat impacted by the proposal. If the threshold is met, the Biodiversity Assessment Method (BAM) needs to be applied to determine the type of survey and assessment and the amount of offsetting required.

If a development application does not meet the threshold or any other triggers, then a smaller ecological report is still required to address the ecologically relevant "heads of consideration" in the section 4.15 (79C) of the EP&A Act and LEP/DCP requirements. The Federal EPBC Act and Fisheries Acts requirements may also require an ecological assessment report.

1.3.4 Biosecurity Act 2015

The Biosecurity Act requires that all plants be regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or should know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, where it is reasonably practicable.

Specific legal requirements apply to State determined priority weeds listed in Appendix 1 of the Greater Sydney Regional Strategic Weed Management Plan 2017-2022. Weeds listed Appendix 2 as 'other weeds of regional concern' warrant resources for local control or management programs and are a priority to keep out of the region. Inclusion in this list may assist Local Control Authorities and/or land managers to prioritise action in certain circumstances where it can be demonstrated the weed poses a threat to the environment, human health, agriculture etc.

This Act does apply to this property and needs to be assessed and reported but is not consideration for assessment of the application.

1.3.5 Federal Environment Protection and Biodiversity Conservation Act, EPBC Act

This report also identifies flora and fauna species or communities, relevant to the site that are listed under Part 13 Division 1 of the *Environment Protection & Biodiversity Act 1999 (Cwlth)* (EPBC). Species or communities listed in the Act are considered to be "matters of national environmental significance" and consideration needs to be given as to whether the proposed development will or is likely to have a "significant impact" on "matters of national environmental significance". In determining whether a "significant impact" will occur, consideration is given to;

- EPBC Act Administrative guidelines on significance (DEH 2006)

Should the assessment in this report determine that a "significant impact" will occur or is likely to occur on "matters of national environmental significance" the proposed development will need to be referred to the Minister (Cwlth) to determine as to whether or not the proposed development is a "controlled action".

Part 13 Division 1 of the *Environment Protection & Biodiversity Conservation Act 1999 (Cwlth)* (EPBC) lists flora, fauna and ecological communities that are considered to be "matters of national environmental significance". Under the Act consideration must be given as to whether the proposed actions will or is likely to have a "significant impact" on "matters of national environmental significance".

There is currently no agreement in place between the State and Federal governments regarding the requirement for ecological assessment of Matters of National Significance.

Assessment of a Development Application with respect to the EPBC Act 1999 is not a Council issue but is the responsibility of the proponent. Proponents should be advised by their ecological consultant whether a referral is necessary. Assessment under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) is needed if the proposal is considered likely to have an impact on a 'matter of National Environmental Significance (NES)' then the proposal would need detailed assessment and referral to the Federal Department of Environment and Energy (DEE) thus providing a trigger for referral of the proposal to the Environment Department for assessment. Matters of national environmental significance identified in the Act are: world heritage properties; national heritage places; RAMSAR wetlands; nationally threatened species and communities; migratory species protected under international agreements; the Commonwealth marine environment; nuclear actions and a water resource, in relation to coal seam gas development and large coal mining development.

This report addresses the requirements of this legislation.

1.4 Definitions and Acronyms

APZ (Bushfire hazard fuel reduction Asset Protection Zone) - Defined in the document '*Planning for Bushfire Protection 2006*' by the NSW Rural Fire Service. Usually consisting of an Inner Protection Area (**IPA**) and an Outer Protection Area (**IPA**)

BAM - Biodiversity Assessment Method described by Office of Environment and Heritage August 2017 and referred to by the BC Act regulation.

BOS – Biodiversity Offset Scheme the system of trading biodiversity offset credits, paying for offsets and the Biodiversity Trust.

BC Act (NSW Biodiversity Conservation Act 2016) - Contains the lists of threatened species, the definitions of the threatened ecological communities, the 5-part Test of Significance and the BOS. There are associated Biodiversity Conservation regulations which refers to the BAM.

DCP (Development Control Plan) - A local planning instrument for each LGA.

DPIE – NSW government of Department of Planning, Industry and Environment

EES – DPIE group Environment Energy and Science, formerly OEH, NPWS, DEC, DECC and DECCW. The department responsible for the conservation of native flora and fauna.

Direct Impacts - impacts that directly affect habitat, ecosystems and individuals. They include, but are not limited to, death, trampling, poisoning of the animal/plant itself and the removal of vegetation and suitable habitat. When applying each factor, consideration must be given to all of the likely direct impacts of the proposed activity or development during construction. As defined by the 2006 DECC Assessment of significance guidelines.

Indirect Impacts - Occur when project-related activities affect species, populations or ecological communities in a manner other than direct loss. Indirect impacts can include loss of individuals through starvation, exposure, predation by domestic and/or feral animals, loss of breeding opportunities, loss of shade/shelter, deleterious hydrological changes, increased soil salinity, erosion, inhibition of nitrogen fixation, weed invasion, fertiliser drift, or increased human activity within or directly adjacent to sensitive habitat areas. Indirect impacts may occur after construction during the life of the development, e.g. escape of garden plants, excess nutrients and changes in fire frequency and grazing. As with direct impacts, consideration must be given, to all of the likely indirect impacts of the proposed activity or development (2006 DECC Assessment of Significance Guidelines)

DPIE – NSW government of Department of Primary Industries and Environment

EPA Act (EP&A Act) – NSW Environment Planning and Assessment Act 1979, controls development in NSW.

EPBC Act (Federal Environment Protection and Biodiversity Conservation Act 1999) – Identifies matters of national environmental significance to protect nationally significant fauna, ecological communities and heritage sites.

IPA (Bushfire hazard Inner Protection Area) - Defined in the document '*Planning for Bushfire Protection 2006*'.

LEP (Local Environment Plan) - A local planning instrument for each LGA.

Native Vegetation –as defined in the LLS Act section **60B:**

Meaning of "native vegetation"

"native vegetation" *means any of the following types of plants native to New South Wales:*

(a) trees (including any sapling or shrub or any scrub),

(b) understorey plants,

(c) groundcover (being any type of herbaceous vegetation),

(d) plants occurring in a wetland.

(2) A plant is native to New South Wales if it was established in New South Wales before European settlement. The regulations may authorise conclusive presumptions to be made of the species of plants native to New South Wales by adopting any relevant classification in an official database of plants that is publicly accessible.

(3) For the purposes of this Part, native vegetation extends to a plant that is dead or that is not native to New South Wales if:

(a) the plant is situated on land that is shown on the native vegetation regulatory map as category 2-vulnerable regulated land, and

(b) it would be native vegetation for the purposes of this Part if it were native to New South Wales.

(4) For the purposes of this Part, native vegetation does not extend to marine vegetation (being mangroves, seagrasses or any other species of plant that at any time in its life cycle must inhabit water other than fresh water). A declaration under section 14.7 of the Biodiversity Conservation Act 2016 that specified vegetation is or is not marine vegetation also has effect for the purposes of this Part.

OPA (Bushfire hazard Outer Protection Area) - Defined in the document '*Planning for Bushfire Protection 2006*'.

Property – Adjacent or nearby lot(s) that have the same ownership.

Protected Fauna - Refers to any native bird, mammal, reptile or frog in NSW.

Study Area - The subject Site and any additional areas which are likely to be affected by the proposal, either directly or indirectly. The study area should extend as far as is necessary to take all potential impacts into account (DECC 2006).

Subject Site - The area directly affected by the proposal (DECC 2006).

Test of Significance (5-Part Test) - Assessment under Section 7.3 of the BC Act to determine whether a proposed development or activity is likely to significantly affect threatened species, or ecological communities, or their habitats.

Threatened Species or Ecological Community - Refers to those biotas listed in the schedules of the Biodiversity Conservation Act 2016 as "Critically Endangered ", "Endangered" or "Vulnerable".

For definitions that are relevant to the Assessment of Significance such as ***Life cycle***, ***Viable***, ***Local population***, ***Risk of extinction, Local occurrence***, ***Risk of extinction, Composition***, ***Habitat***, ***Extent***, ***Importance***, ***Locality***, "***likely***" and "***significant***" "***affect***" see the Assessment of Significance Appendix.

1.5 Assumptions and Limitations

- This report only addresses the impacts of the proposal described in this report and shown on the maps in this report. If there are changes or additions that may change the ecological impact of the proposal, then this report may require updating.
- This report describes the habitat and species within the Study Area at the time of the field survey. Vegetation and habitat will change over time, as does legislation. Therefore, the findings of this report are likely to be out of date in 12 months.
- This report assesses only the current proposal and does not consider the cumulative impact of other developments on this property or on adjacent land or the potential edge effects or impacts caused by the occupation of the land.
- There may be flora and/or fauna species present within the study area that were not recorded because they are seasonal, cryptic and/or have large home ranges. Some threatened species may use the study area as habitat at some time. The conclusions drawn in this report are a result of testing, observation and experience.
- This report should be read in its entirety and no part should be taken out of context.
- No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.
- No landscape plan was available at the time of writing.

1.6 Qualifications and Experience of the Field Ecologist and Authors

Nicholas Skelton's formal qualifications include a Bachelor of Science with Honours (B. Sc. (Hons) USyd) and a Masters in Applied Science (M. App. Sc. in Vegetation Management UNSW). Nick has been an environmental scientist for 25 years, including a university lecturer, research ecologist and a bush regenerator for 8 years. His work is focused on the Sydney bioregion and he has published many papers in independently reviewed journals on the ecology of NSW. He has expert knowledge of the local soils, the climate of this area and the local indigenous plants and animals as a result of over 900 ecological surveys. Nick is a member of the relevant professional organisations including: a practising member of the Ecological Consultants Association of NSW and Royal Zoological Society. He is licensed by NSW OEH and NSW Department of Primary Industries to carry out surveys on threatened plants and animals and he is a qualified Biodiversity Assessor under the BC Act 2016. Nick was the principal ecologist on all field surveys and was responsible for map making and report writing and editing. Further details can be found at ecology.net.au

Josh Lee has a Bachelor of Advanced Science with Honours and was responsible for field assessment and report writing.

Joshua Drane's formal qualification Bachelor of Environmental Science ACU. For the last 4 years Joshua has been an practicing ecologist surveying and assessing biodiversity in the New South Wales area. Joshua was responsible for report writing and editing.

1.7 General Description of the Proposal

The proposal as shown on Map 6, includes:

- Demolition and reconstruction of the driveway;
- Demolition and reconstruction of the garage with additional rooms;
- Partial demolition of the existing dwelling;
- Construction of a replacement house;
- Construction of a new semi-suspended pool and deck;
- Landscaping including new lawn area and courtyard;

Access will mostly be via a driveway from Whale Beach Rd in the western end of the site. The property also has pedestrian access to Whale Beach to the east.

1.7.1 Bushfire Asset Protection

The subject site is not mapped on Northern Beaches Councils Bushfire Prone Land Map (2020).

1.8 Plans and Documents Used for this Report

The plans and documents used in this report are listed in Table 2.

Table 2: Plans and documents used in this report

Title	Author	Rev	DWG./Doc. No./Ref.	Date
Proposed Site Plan	Nanna Lesuik Housed Architects	-	DA01	20/9/2021
Proposed Section 01	Nanna Lesuik Housed Architects	-	DA11	8/10/21
Landscape Concept	Nanna Lesuik Housed Architects	-	DA14	8/10/21
Geotechnical Investigation	White Geotechnical Group	Draft	J3578	21/7/2021

Legend

255 Whale Beach Rd, Whale Beach

Northern Beaches

Cadastre

Source of Aerial Photo: Google

Map 1
Site, Aerial Photograph

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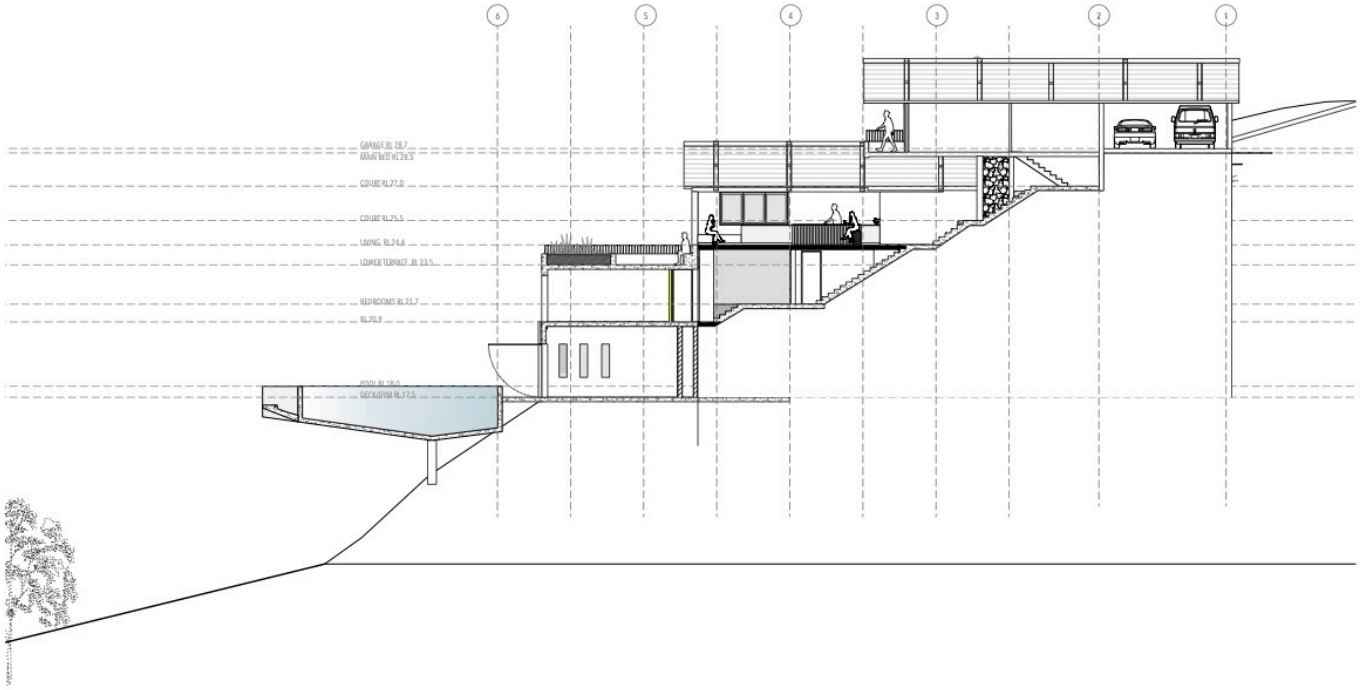
Date: 18/8/2021
Drawn by: Nicholas Skelton
Version 1
Projection: GDA 94 MGA 56

0 9 18 m



HOUSED
BY HANNA LESIUK
m:0405126186 e:hannalesiuk@housedarchitects.com

project:
255 WHALE BEACH ROAD
WHALE BEACH

drawing:
DA 11 PROPOSED SECTION 01

date :
8/10/21

status :
DEVELOPMENT APPLICATION

scale :
1:150

Legend

255 Whale Beach Rd, Whale Beach

Northern Beaches

pointofinterest Black

Watercourse

Watercourse Non Perennial

Cadastre

Source of Aerial Photo: Google

Map 2
Locality, Aerial Photograph

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Projection: GDA 94 MGA 56

0 80 160 m

2 Existing Environment – Vegetation Habitat and Environmental Context

2.1 Literature and Database Search

Relevant information was obtained from literature, local knowledge and established sources such as scientific journals, electronic databases and reports. Records gathered were also used and data in databases were consulted including BioNet (NPWS Atlas of NSW Wildlife records, Australian Museum specimen records and the Royal Botanic Gardens), ROTAP records and Birds Australia Atlas. Searches were also undertaken on the DOEE – 'protected matters search tool' website to generate a report that will help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in the area of interest.

This information was used to ascertain which threatened species are known to occur within a 5km radius of the study area. The data were then combined with local knowledge and the habitat conditions within the study area to compile a list of plant and animal species for specific targeting during the fieldwork. These lists are Table 3 and 4.

2.2 Locality and Adjacent Land

The site is surrounded on three sides by residential lots many of which are also steep. The eastern border of the site connects it to the dune vegetation of Whale Beach. The residential lot immediately to the north currently has a house being constructed. The environmental and built form features are shown on Maps 2 and 3. To the west is Morella Reserve, and further west is Palm Beach Forest. The proximity of the site to nearby bushland is shown on Maps 2 and 3. Immediately to the east of the site is Whale Beach and the South Pacific Ocean.

2.3 Landscape Features in the Locality

The location of the site and its local context with respect to topography, cadastre, water features, roads, reserves, soil types, fire history, infrastructure and mapped vegetation shown on Maps 2, 3 and 4.

2.4 Study Area and Subject Site

For this proposal the Subject Site, Study Area and Property are the same.

2.4.1 Geographic co-ordinates

The geographic co-ordinates of the study area are -33.6078, 151.33147 or the cartesian co-ordinates UTM Zone 56 MGA 345202, 6280072.

2.4.2 Topography

The site slopes to the east at an approximately 25º slope. The site varies from 29m in the western side of the proposal area to 5m above sea level on the eastern side. 2 m contours of the site are shown by pink lines and labels on Map 5 and 10m contours in the locality are shown on Map 3.

2.4.3 Drainage

Drainage on the site is to the east down the steep slope to the creek within the property. The South Pacific Ocean is approximately 70m to the east. Drainage in the locality is shown by light blue lines or polygons on Map 3.

2.4.4 Riparian Land

The site is not mapped as containing Riparian Land.

2.4.5 Geology and Soils

The property is on the Watagan Soil Type (Soils Sydney ed4 DPI) on Hawkesbury Sandstone geology (NSW seamless geology v2) as is shown on Map 4 in a thick brown line and labels. The site includes some of the dune formation of Whale Beach on the eastern side.

2.5 Vegetation Mapping in the Locality

Map 4 shows the location and abundance of the vegetation types (ecological communities) that have been mapped at local scale in the vicinity of the site (Native Vegetation of the Sydney Metropolitan Area V3.1 2016 (OEH). The vegetation in the central part of the property is mapped as Coastal Enriched Sandstone Moist Forest (S_WSF02, PCT 1841).

2.6 Wildlife Corridors

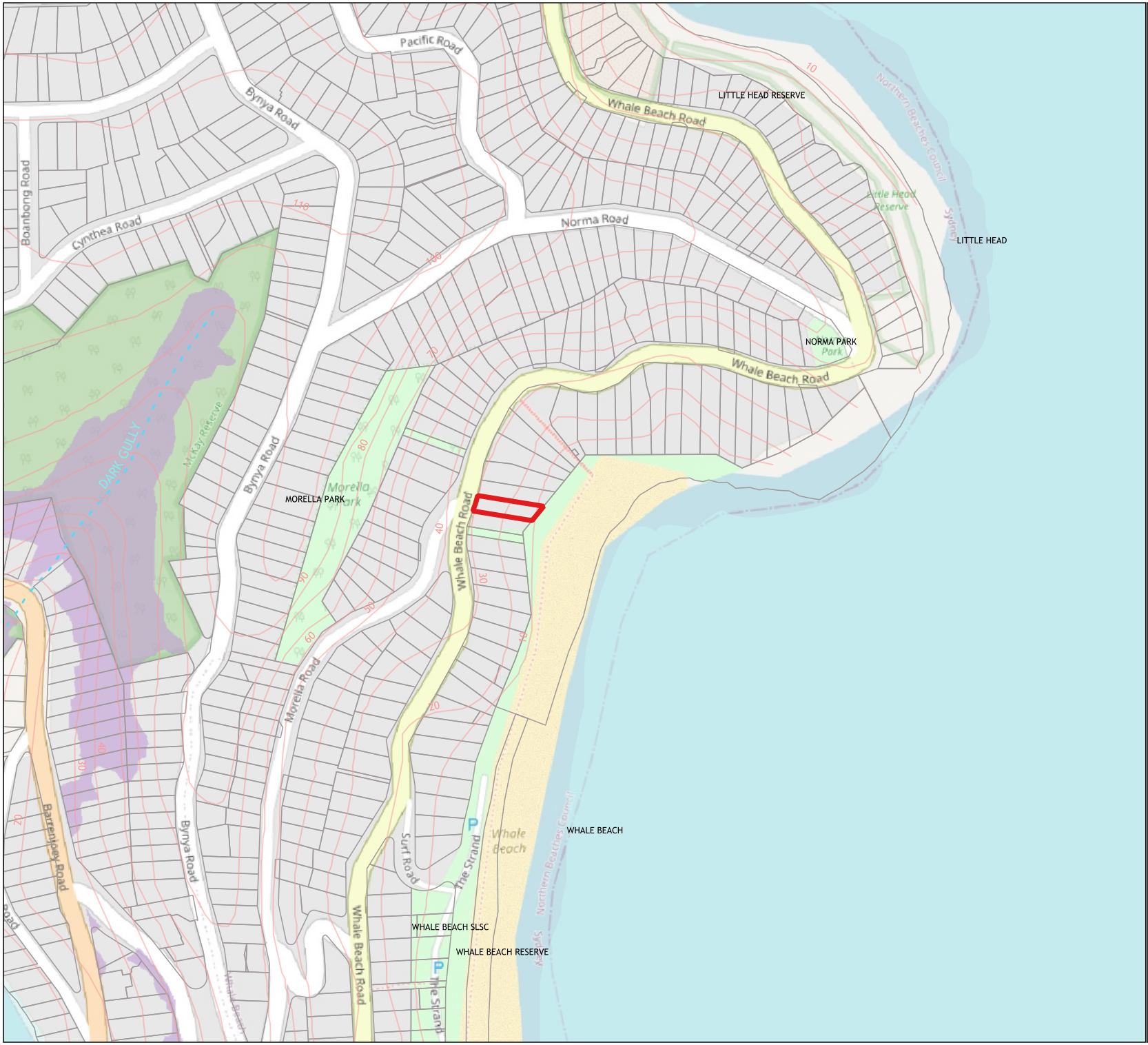
Wildlife corridors form important connections between remnant patches of bushland. They allow exchange of genetic material (pollen, seed, spores, animals etc.) between large areas of habitat in the landscape and fragmented remnants. They are very important in preventing local extinctions of flora and fauna.

Vegetation on the east of the site contributes to a wildlife corridor that connects the dune vegetation with vegetation along Whale Beach to Careel Headland reserve in the south and to Little Head Reserve in the north. The vegetation on the property is connected to scattered urban vegetation leading to Morella Reserve and Palm Beach Forest further. There are extensive tree canopies and native vegetation in Morella Reserve. Morella Reserve hooks to the north then east ending at Norma Reserve. Palm Beach Forest stretches to the north-west passing through the dense vegetation at McKay reserve then through scattered urban vegetation eventually reaching Barrenjoey Headland. to the south the vegetation corridor reaches as far as Careel Bay.

Vegetation on the east of the site contributes to a wildlife corridor that connects the dune vegetation with vegetation in Morella Reserve through vegetation from the public pathway and the council creek line reserve. There are extensive tree canopies and native vegetation in Morella Reserve 70m to the west of the site and Palm Beach Forest 300m to the west of the site.

2.7 Biodiversity Values Mapping

The site has not been mapped as containing area of biodiversity values as can be seen on Map 3.



Legend

255 Whale Beach Rd, Whale Beach

Northern Beaches

pointofinterest Black

Contour

10 metre

Watercourse

Watercourse Non Perennial

Cadastre

Biodiversity Values Map

Biodiversity Values (DPIE) Purple

Sea

Topographic Map (Source: OpenStreetMap)

Map 3
Locality, Topography and Features

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Version 1
Projection: GDA 94 MGA 56

0 80 160 m

Legend

255 Whale Beach Rd, Whale Beach

Northern Beaches

Distributor Road

Local Road

Path

Watercourse

Watercourse Non Perennial

Cadastre

Geology and Soils

Soils

Geology NSW 2.0

Sea

Vegetation of Sydney v3.1 (OEH 2016) Nth Beaches

Forest PCT Number: 1776
S_DSF04: Coastal Enriched Sandstone Dry Forest

Forest PCT Number: 1841
S_WSF02: Coastal Enriched Sandstone Moist Forest

Grassland PCT Number: 1204
S_GL01: Beach Spinfex Grassland

Rainforest PCT Number: 1833
S_RF07: Coastal Escarpment Littoral Rainforest

Scrub PCT Number: 1817
S_HL01: Coastal Headland Clay Heath

Scrub PCT Number: 772
S_HL05: Coastal Foredune Wattle Scrub

Tall Forest PCT Number: 1214
S_WSF11: Pittwater Spotted Gum Forest

Woodland/Forest PCT Number: 1776
S_DSF04: Coastal Enriched Sandstone Dry Forest

Map 4
Locality, Mapped Vegetation Types and Threatened Species

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Date: 18/8/2021
Drawn by: Nicholas Skelton
Version 1
Projection: GDA 94 MGA 56

0 60 120 m

2.8 Targeted Threatened Species

Table 3: Targeted Threatened Flora Species

Genus and Species	Common Name	BC Act status	EPBC Act status	BioNet records within 5 km
Syzygium paniculatum	Magenta Lilly Pilli	E1	V	3
Chamaesyce psammogeton	Sand Spurge	E1		2

Table 4: Targeted Threatened Fauna Species

Class	Common Name	Genus and Species	BC Act status	EPBC Act status	BioNet records within 5 km
Aves	Barking Owl	*Ninox connivens*	V,P,3		2
Aves	Little Lorikeet	*Glossopsitta pusilla*	V,P		1
Aves	Powerful Owl	*Ninox strenua*	V,P,3		16
Aves	Superb Fruit-Dove	*Ptilinopus superbus*	V,P		2
Mammalia	Grey-headed Flying-fox	*Pteropus poliocephalus*	V,P	V	73
Mammalia	Large-eared Pied Bat	*Challinobolus dwyeri*	V,P	V	6
Mammalia	Little Bent-winged Bat	*Miniopterus australis*	V,P		26
Mammalia	Southern Myotis	*Myotis macropus*	V,P		7

Key for BC Act Status

Status	Status	Status Notes
P	Protected Animal	Fauna not listed in Schedule 11 of the NPW Act 1974. Only shown for species that are listed in the other Acts
V	Vulnerable	Schedule 1, part 3, BC Act 2016, Likely to become endangered unless the circumstances & factors threatening its survival or evolutionary development cease to operate.
E1	Endangered	Schedule 1, part 2, BC Act 1995, Likely to become extinct in nature in NSW unless the circumstances and factors threatening its survival or evolutionary stop, in immediate danger of extinction
E2	Endangered Population	Schedule 1, part 2, division 4, BC Act 2016, Population where, numbers have been reduced to such a critical level, or its habitat has been so drastically reduced, that it is in immediate danger of extinction
3	Category 3 sensitive species	Species are classed as of medium sensitivity, and provision of precise locations would subject the species to medium risk from threats such as collection/deliberate damage.

Key for EPBC Act Status

Code	Description	Definition under the EPBC Act 1999, and Migratory Birds agreement.
C	CAMBA	China-Australia Migratory Bird Agreement: Refers to species listed in the Bilateral Agreement between the Government of Australia and the Government of the People's Republic of China for the protection of Migratory Birds and their Environment (Subdivision A of Division 1 of Part 5, Commonwealth EPBC Act 1999).
E	Endangered	Refers to a native species is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria (Subdivision A of Division 2 of Part 13, Commonwealth EPBC Act 1999).
J	JAMBA	Japan-Australia Migratory Bird Agreement: Refers to species listed in the Bilateral Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (Subdivision A of Division 1 of Part 5, Commonwealth EPBC Act 1999).
K	ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement: Refers to species listed in the Bilateral Agreement between the Government of Australia and the Government of the Republic of Korea for the protection of Migratory Birds and their Environment (Subdivision A of Division 1 of Part 5, Commonwealth EPBC Act 1999).
V	Vulnerable	Refers to a native species is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria (Subdivision A of Division 1 of Part 13, Commonwealth EPBC Act 1999).

Code	Description	Definition under the EPBC Act 1999, and Migratory Birds agreement.
X	Extinct	Refers to a native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died (Subdivision A of Division 1 of Part 13, Commonwealth EPBC Act 1999).

2.9 Field Survey

The field survey was carried out on the 18th of August 2021 by three experienced ecologists over 6 person-hours. The weather was sunny, and the temperature was 18ºC. During the field surveys, all sections of the study area and some of the surrounding land were traversed on foot. The study area was searched for the presence of threatened flora and fauna species and their habitats. Endangered Ecological Communities were assessed for likelihood of occurrence.

The field survey involved the following procedures:

- Initial familiarisation with the study area and its extent and surrounding land;
- Assessment of the physical characteristics of the study area and location of the proposal;
- Recording of all plant species in each vegetation type
- Identification of fauna through sightings, calls and potential habitat;
- Search for scats, remains, nests, dreys, bones, feathers, fur, diggings, scratches, tracks, owl white-wash and food sources. Examination of trees for scratchings, sap-feeding notches and hollows;
- Classification of any vegetation into communities according to their structural and floristic attributes;
- Assessment of the habitats within the Study Area;
- Detailed search for targeted Threatened Species;
- Assessment of the extent of disturbance and weed invasion;
- Photography of the study area;

2.9.1 Determining Plant Community Type

The plant community (vegetation) types within, and adjacent to, the Site were classified using a 4-step process that involved online databases (VIS), spatial analysis, correlation of characteristic species lists (floristic analysis) and comparison to structural and environmental parameters from published classifications. The vegetation types were assessed for similarity to threatened ecological community determinations listed in the BC Act, the VIS database and the accompanying descriptions for the most up to date vegetation mapping in the locality.

The vegetation within the study area was classified using structural and floristic indicators and was compared with threatened ecological communities listed in the BC Act 2016 and with the document titled The Native Vegetation of the Sydney Metropolitan Area V3 Volume 2 (OEH 2016) and the Bionet PCT vegetation type database. A detailed description of the method to determine the presence of Threatened Ecological Communities (EEC) within the study area was determined is given in Section 2.1.

2.9.2 Threatened Fauna Habitat Survey

Fauna species were actively searched for by examining rock crevices, searching for tree hollows and looking for animals and/or for signs of use by animals. Elliott, cages or 'harp' traps were not used to reduce any stress to animals.

3 Findings

3.1 Description of the Study Site

The Site is a 918.8 m^2 east sloping block with access being a driveway from Whale Beach Road and access by foot from Whale Beach. The study site is currently vacant. Western and eastern parts of the site are connected by a wooden and concrete staircase along the southern boundary. There are formed gardens on the western side of the site and below the existing house near the centre of the plot. A small patch

of lawn is present below the existing house near the centre of the plot. Large areas of historically formed gardens are present across much of the eastern half of the site, however these have become overgrown and show little sign of recent maintenance. There are several large, scattered native and invasive trees throughout the eastern half of the site. The features of the site are shown on Map 5.

3.1.1 Disturbance History

Whale Beach was originally part of the Palm Beach estate with Palm Beach and Newport. Careel House, overlooking Whale Beach, is a heritage listed building on Careel Head which was built in 1931. There has been more recent disturbance in the form of landscaping and introduction of weeds and garden plants over the entirety of the site as can be seen in photos 1-6. This is likely to have reduced the number of species recorded during the field survey.

3.1.2 Fire History

The vegetation on the site shows signs of not having been burnt in decades. There have been no fires recorded on the site in recent history.

3.1.3 Existing Habitat

There are 5 trees on the site, a mixture of native and exotic species which provide arboreal foraging and roosting habitat for native birds, habitat for possums, and potential foraging habitat for several Threatened species. There is a loose rock wall and medium which provide suitable habitat for a range of reptile species.

The extant vegetation in the reserve to the west and the dune vegetation running north-south on the east of the site is good quality habitat for a range of Threatened and non-threatened fauna and flora. This site itself is likely to be part of a large foraging home range for common and threatened birds, small reptiles, mammals and microbats but does not contain any specific or important habitat for threatened species.

Nearby habitat and bushland areas are shown in Maps 2 and 3. The habitat on this site is shown on Maps 1, 4, 5 and 6. Habitat features on the site are shown in Photos 1 - 6.

3.2 Plant Species

A total of 50 plant species were recorded on site, of which 11 (22%) are local native species, 6 (12%) have been planted, 1 (2%) uncommon and the remaining 32 (64%) are weed species. Of the local native species, four were tree species, one was palm a species, one was local native fern, and the rest of the local native species were herbs, sedges or grasses. This number of species is very low and reflects the extensive disturbance history of the site. The list of species is Table 6 which shows each species' scientific name, common name, family, growth form, status and location.

Table 1. Plant Species List
Floristics and Relative Abundances

255 Wale Beach Road, Whale Beach

18 August 2021

by Nicholas Skelton, GIS Environmental Consultants

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Floristics

Species Richness, Summarised by Growth Form and Status

	Local Native in plot	Weed in Plot	Planted	Uncommon	Total
Fern	1	2		1	4
Grass		6			6
Herb	4	16	2		22
Sedge	1				1
Shrub		5	4		9
Tree	4	1			5
Vine		2			2
Palm	1				1
	11	32	6	1	50

Plant Species

Genus and Species	Family	Growth Form	Common name	Status	Location
Ambrosia sp.	ASTERACEAE	Herb	Rag Weed	Weed	Dune
Arundo donax	POACEAE	Grass	Giant Reed / Elephant Grass	Weed	Dune
Asparagus asparagoides	ASPARAGACEAE	Herb	Bridal Creeper, Mir	Weed	Dune
Asparagus plumosus	ASPARAGACEAE	Herb	Climbing Asparagus	Weed	Dune
Erythrina crista-galli	FABACEAE	Tree	Cockspur Coral Tree	Weed	Dune
Hydrocotyle bonariensis	APIACEAE	Shrub	Kurnell Curse	Weed	Dune
Ipomea indica	CONVOLVULACEAE	Vine	Morning glory	Weed	Dune
Lantana camara	VERBENACEAE	Shrub	Lantana	Weed	Dune
Senecio madagascariensis	ASTERACEAE	Herb	Fire Weed	Weed	Dune
Ageratina adenophora	ASTERACEAE	Herb	Crofton Weed	Weed	Lagoon
Canna indica	CANNACEAE	Herb	Canna Lily	Weed	Lagoon
Ipomea indica	CONVOLVULACEAE	Vine	Morning glory	Weed	Lagoon
Acmena smithii	MYRTACEAE	Tree	Lily Pilly	Local Native Species	Slope
Archontophoenis cunninghamiana	ARECACEAE	Palm	Bangalow Palm	Local Native Species	Slope
Banksia integrifolia ssp. integrifolia	PROTEACEAE	Tree	Coastal Banksia	Local Native Species	Slope
Commelina cyanea	COMMELINACEAE	Herb	Creeping Christian	Local Native Species	Slope
Cyperus gracilis	CYPERACEAE	Sedge	0	Local Native Species	Slope

Dianella caerulea var. producta	PHORMIACEAE	Herb	Blue Flax Lily		Local Native Species	Slope
Oxalis rubens	OXALIDACEAE	Herb		0	Local Native Species	Slope
Syzygium australe	MYRTACEAE	Tree	Bush Cherry		Local Native Species	Slope
Tetragonia tetragonoides	AIZOACEAE	Herb	Warrigal Greens, Native Spinach		Local Native Species	Slope
Agapanthus praecox	AMARYLLIDACEAE	Herb	Agapanthus		Planted	Slope
Clivea miniata	AMARYLLIDACEAE	Herb	Kaffir Lily		Planted	Slope
Murraya paniculata	RUTACEAE	Shrub	Mock Orange		Planted	Slope
Psidium cattleianum	MYRTACEAE	Shrub	Cherry Guava		Planted	Slope
Cyathea cooperi	CYATHEACEAE	Fern	Straw Tree Fern		Uncommon	Slope
Aristea ecklonii	IRIDACEAE	Herb	Blue Eyed Iris		Weed	Slope
Asparagus officinalis	ASPARAGACEAE	Herb	Asparagus		Weed	Slope
Bidens pilosa	ASTERACEAE	Herb	Cobbler's Pegs, Pitchforks		Weed	Slope
Canna indica	CANNACEAE	Herb	Canna Lily		Weed	Slope
Conyza bonariensis	ASTERACEAE	Herb	Fleabane		Weed	Slope
Coprosma repens	RUBIACEAE	Shrub	Looking-glass Bush		Weed	Slope
Ehrharta erecta	POACEAE	Grass	Ehrharta		Weed	Slope
Hedychium gardnerianum	ZINGIBERACEAE	Herb	Ginger Lily		Weed	Slope
Nephrolepis cordifolia	DAVALLIACEAE	Fern	Fishbone Fern		Weed	Slope
Parietaria judaica	URTICACEAE	Herb	Asthma Weed, Pellitory		Weed	Slope
Paspalum dilatatum	POACEAE	Grass	Paspalum		Weed	Slope
Phyllostachys sp.	POACEAE	Grass	Rhizomatous Bamboo		Weed	Slope
Plumbago sp.	PLUMBAGINACEAE	Shrub	Plumbago		Weed	Slope
Poa annua	POACEAE	Grass	Winter Grass		Weed	Slope
Senna pendula	CAESALPINIOIDEAE	Shrub	Cassia		Weed	Slope
Solanum nigrum	SOLANACEAE	Herb	Black-berry Nightshade		Weed	Slope
Sonchus oleraceus	ASTERACEAE	Herb	Sow Thistle		Weed	Slope
Stelleria media	CARYOPHYLLACEAE	Herb	Common Chickweed		Weed	Slope
Stenotaphrum secundatum	POACEAE	Grass	Buffalo Grass		Weed	Slope
Christella dentata	THELYPTERIDACEAE	Fern	Christella		Local Native Species	Top
Cupaniopsis anacardiodies	SAPINDACEAE	Tree	Tuckeroo, Yowarro		Local Native Species	Top
Buxus microphylla	BUXACEAE	Shrub	Japanese Buxus		Planted	Top
Nerium oleander	APOCYNACEAE	Shrub	Oleander		Planted	Top
Cyrtomium falcatum	DRYOPTERIDACEAE	Fern	Holly Fern		Weed	Top

Photo 1: At the top of the site, looking east from corner of Whale Beach Road and Morella Road.

Photo 2: Mid site, looking east

Photo 3: Eastern side of the property, looking west.

Photo 4: Eastern side of the property, looking east at Whale Beach hind dune.

Photo 5: Eastern side of the property, looking north.

Photo 6: Australian Brush-turkey mound on eastern side of the property.

3.3 Non-threatened Fauna

During the field survey evidence was found of the following fauna species using the study area:

Table 7: Non-threatened Fauna Found

Common Name	Scientific Name	Evidence
Birds		
Australian Brush-turkey	*Alectura lathami*	Nest on site
Silver Gull	*Chroicocephalus novaehollandiae*	Observed
Noisy Miner	*Manorina melanocephala*	Observed
Rainbow Lorikeet	*Trichoglossus haematodus*	Observed
Sulphur-crested Cockatoo	*Cacatua galerita*	Observed
Pied Currawong	*Strepera graculina*	Observed
Grey Butcherbird	*Cracticus torquatus*	Observed
Eastern Osprey	*Pandion cristatus*	Observed
Nankeen Kestrel	*Falco cenchroides*	Observed
Australian Magpie	*Gymnorhina tibicen*	Observed
Mammals		
Long-nosed Bandicoot	*Perameles nasuta*	Diggings
Common Ringtail Possum	*Pseudocheirus peregrinus*	Drey on site

3.4 Threatened Species

No threatened flora species were observed on the site. One Eastern Osprey was observed flying overhead during the site survey. This species is listed as vulnerable in NSW (BC Act), however, no suitable breeding or foraging habitat occurs on the site, so the species was not included in the targeted threatened fauna survey (Table 9). The extant vegetation beyond the southern boundary is considered to be good habitat for a range of species. It is likely that wide ranging threatened fauna species that occur in the locality use the site on occasion, however, the proposal will not harm any important habitat such as breeding hollows and the habitat on the site is only foraging habitat or a corridor. The likelihood of targeted Threatened flora and fauna species occurring on the study area and potential impacts to the target Threatened flora and fauna species is assessed in Tables 8 and 9.

3.5 Habitat Trees

No hollow-bearing trees were located during the site survey. Habitat trees on the site include several exotic species (planted and invasive) and one native (*Banksia integrifolia*). A possum drey was located in a *Nerium oleander* in the formed garden beds on the western side of the site. The other trees on the site are in good condition and fauna may utilise the site for foraging as a part of a larger home range.

3.6 Ecological Communities Present on the Site

This site is too disturbed it doesn't meet the definition of any Plant Community Type. Historically it would have likely been **772 – Coast Banksia – Coast Wattle Dune Sydney Basin and South East Corner** Majority of the south-eastern portion of the site is mapped as Urban Exotic/Native" on the Native Vegetation of the Sydney Metropolitan Area Map (V3.1, OEH 2016). The site is currently mapped as "Cleared" on the NSW Extant Native Vegetation Map (V2, Keith and Simpson 2006). A small section of the south-eastern end of the site is mapped as Spinifex Beach Strand Grassland, Sydney Basin Bioregion and South East Corner Bioregion, this area will not be impacted by the proposal.

Legend

255 Whale Beach Rd, Whale Beach

Northern Beaches

Contour

2 metre

Cadastre

Map 5
Site, Existing Ecological Features and Structures

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Date: 18/8/2021
Drawn by: Nicholas Skelton
Version 1
Projection: GDA 94 MGA 56

0 6 12 m

4 Impact Assessment

4.1 Avoidance and Minimisation of Impact

The Biodiversity Conservation Act 2016 requires that all developments "Avoid" then "Minimise" ecological impacts. Once all possible impact minimisation and avoidance has been undertaken, then offsetting can be used to offset the remaining impacts of the proposal (see Map 6) on the environment.
The main ecological constraints that have been identified on the site are one mature *Banksia serrata* and an active Australian Brush-turkey nest. Both of these ecological values are below the footprint of the proposed development and are not expected to be affected.
Due to the slope of the site, particular attention will need to be paid to sediment control during construction and for the life of the development. This will need to ensure that sediment, nutrients, or exotic plant seeds do not leave the site and harm the adjacent ecological values.

4.2 Description of Impacts

4.2.1 Vegetation and Tree Loss

The proposal will remove a small area approximately 80 sqm of disturbed exotic and native species in the slope location. The extent and location of the impact of this vegetation removal can be seen on Map 6 respectively. The proposal does not require the removal of any native trees.

4.2.2 Impact on Wildlife Corridor

The proposal will remove a small area approximately 80 sqm of disturbed exotic and native species in the slope location. It is unlikely that the proposal will impact the movement of species that currently use the site as part of their home range and as a wildlife corridor, including birds and bats, as these are all highly mobile species.

4.2.3 Loss of Tree Hollows

No tree hollows will be lost.

4.2.4 Potential Indirect Impacts

The change in soil moisture levels may impact the viability of trees to be retained, in the future.

4.2.5 Impact to Threatened Species

The site does not contain any important habitat for Threatened species that occur in the locality. The site contains potential foraging habitat for highly mobile species with large home ranges such as large forest owls and microbats.
See Tables 5 and 6 below for the assessment of potential impacts to other Threatened flora and fauna species.

4.2.6 Indirect Impacts and potential impacts during occupation

The indirect impacts of the proposal include;

- Increased weed and exotic growth due to absence of weed control and inappropriate planting at the site or clearing of native vegetation.

Recommendations are made in the report to help reduce the spread of weeds and impacts during ongoing management at the property.

Legend

255 Whale Beach Rd, Whale Beach

Northern Beaches

Contour

2 metre

Cadastre

Vegetation Type/Ecological Community

Sydney Metro Area v3.1 2016 MGA

Grassland PCT Number: 1204
S_GL01: Beach Spinfex Grassland

Boundary of Vegetation for Weed control and regeneration

Map 6
Site, Proposal Impacts and Conservation

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Date: 8/10/2021
Drawn by: Nicholas Skelton
Version 1
Projection: GDA 94 MGA 56

0 5 10 m

4.3 Flora

4.3.1 Assessment of likely occurrence and impacts to Threatened Flora Species (determining candidate species)

The likelihood of targeted threatened flora species occurring on the study area is assessed in the table below.

Table 8: Habitat Suitability for Targeted Threatened Flora Species

Scientific Name	Habitat Preference	Likelihood of Occurrence
Syzygium paniculatum	Grows on gravels, sands, silts and clays in riverside gallery rainforests, as well as remnant littoral and subtropical rainforest communities. It occurs in widely separated localities between Bulahdelah and Jervis Bay. Records from Thornleigh, Chatswood and Seaforth. Also, often planted.	**Historic Records:** Three records within 1 km of the Site. **Local Occurrence**: Very obvious species. Not found during survey. **Habitat Value**: Low quality habitat occurs within study site. **Direct and Indirect Impacts**: Unlikely. **Conclusion**: No further assessment required.
Chamaesyce psammogeton	Grows in coastal sand dunes or exposed areas on headlands. This species has been recorded from Jervis Bay Northward in NSW. Despite once being widespread, C. psammogeton is now rare, with only 9 records in the Sydney region.	**Historic Records:** No recent records within 5 km of the Site. Two historic records from over 40 years ago with in 5 km. **Local Occurrence:** Very obvious species. Not found during survey. **Habitat Value:** Medium quality habitat occurs within study site. **Direct and Indirect Impacts:** Unlikely. **Conclusion:** No further assessment required.

4.4 Fauna

4.4.1 Assessment of Likely Occurrence Threatened Fauna Species (Candidate Species Assessment)

The likelihood of targeted threatened fauna species occurring on the study area is assessed in the table below.

Table 9: Habitat Suitability for Targeted Threatened Fauna Species

Name	Habitat Preference	Likelihood of Occurrence
Barking Owl *Ninox connivens*	Nests in large tree hollows. Inhabits eucalypt woodland, open forest, swamp woodlands along watercourses. Roosts 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. Feeds on a variety of prey, with invertebrates predominant for most of the year, and birds and mammals such as smaller gliders, possums, rodents and rabbits becoming important during breeding.	**Historic Records:** Two recent records within 1 km of the Site. **Local Occurrence**: Low likelihood. **Habitat Value**: No suitable roosting or nesting habitat onsite. Site is likely to be part of a larger home range. **Direct and Indirect Impacts**: Unlikely. Proposal does not extend beyond the property boundary to the south and is unlikely to impact the habitat in the Reserve beyond. Site is likely to be part of a larger home range. **Conclusion**: No further assessment required.
Little Lorikeet	Distributed widely across the coastal and Great Divide regions of eastern Australia from Cape York to South Australia. Nomadic	**Historic Records:** One record within 1 km of the Site. **Local Occurrence**: Low likelihood.

Name	Habitat Preference	Likelihood of Occurrence
Glossopsitta pusilla	movements are common, influenced by season and food availability, although some areas retain residents for much of the year and 'locally nomadic' movements are suspected of breeding pairs. Forages high in treetops and nests in small tree hollows.	**Habitat Value**: Low quality habitat occurs within study site. Site is likely to be part of a larger home range. **Direct and Indirect Impacts**: Unlikely. Conclusion**: No further assessment required.**
Powerful Owl *Ninox strenua*	Nests in large tree hollows. Inhabits large tracts of forest in a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. Roosts along creek lines. Feeds on medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider.	**Historic Records:** Sixteen recent records within 1 km of the Site. **Local Occurrence**: High likelihood. **Habitat Value**: Low quality habitat occurs within study site. No suitable roosting or nesting habitat onsite. Part of a large home range. **Direct and Indirect Impacts**: Unlikely. Proposal does not extend beyond the property boundary to the south and is unlikely to impact the habitat in the Reserve beyond. Site is likely to be part of a larger home range. Conclusion**: No further assessment required.**
Superb Fruit-Dove *Ptilinopus superbus*	Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees. Part of the population is migratory or nomadic. Nests usually 5-30 metres up in rainforest and rainforest edge tree and shrub species. Feeds on a diverse range of tree and vine fruits.	**Historic Records:** Two records within 5 km of the Site. **Local Occurrence**: Low likelihood. **Habitat Value**: Low quality habitat occurs within study site. Site is likely to be part of a larger home range. **Direct and Indirect Impacts**: Unlikely. **Conclusion**: No further assessment required.
Grey-headed Flying-fox Pteropus poliocephalus	Roosting camps are generally located within 20 km of a regular food source and in gullies, close to water, in vegetation with a dense canopy.	**Historic Records**: Seventy-three records within 5 km of site. **Local Occurrence:** High likelihood **Habitat value**: Medium quality habitat occurs within study site. Site is likely to be part of a larger home range. **Direct and Indirect Impacts**: Unlikely. **Conclusion**: 5-Part Test (see Appendix A)
Large-eared Pied Bat *Chalinolobus dwyeri*	Found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. It is generally rare with a very patchy distribution in NSW. There are scattered records from the New England Tablelands and North West Slopes. Found in well-timbered areas containing gullies in low to mid-elevation dry open forest and woodland. Roosts in caves, crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Hirundo ariel*). Probably forages for small, flying insects below the forest canopy.	**Historic Records**: Six records within 5 km. **Local Occurrence**: Low likelihood. **Habitat Value**: Low quality habitat occurs within study site. Site is likely to be part of a larger home range. **Direct and Indirect Impacts**: Unlikely. **Conclusion**: No further assessment required.

Name	Habitat Preference	Likelihood of Occurrence
Little Bent-winged Bat	Inhabits moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Roost in caves, tunnels, tree hollows, abandoned mines, storm water drains, culverts, bridges and buildings during the day, and forage at night for insects.	**Historic Records**: Twenty-six recent records within 5 km. **Local Occurrence**: Low likelihood. **Habitat Value**: Low quality habitat occurs within study site. Site is likely to be part of a larger home range. **Direct and Indirect Impacts**: Unlikely. Unlikely. **Conclusion**: No further assessment required.
Southern Myotis *Myotis macropus*	Needs caves, mines, stormwater pipes, road culverts, tree hollows and similar sites for roosting and breeding. Southern Myotis known to use abandoned fairy martin nests. Forage over streams and pools, catching insects and small fish on the water surface.	**Historic Records**: Seven recent records within 5 km. **Local Occurrence**: Medium likelihood. **Habitat Value**: Low quality habitat occurs within study site. Site is likely to be part of a larger home range. **Direct and Indirect Impacts**: Unlikely. **Conclusion**: No further assessment required.

4.5 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) would only become relevant if it was considered that an impact on a Matter of National Environmental Significance (MNES) were likely, thus providing a trigger for referral of the proposal to the Department of the Environment and Water Resources.

A Protected Matters search was conducted within a 10km radius of the site. A Protected Matters search is a broad scale assessment that includes World Heritage Properties, National Heritage Places, Wetlands of International Importance, Great Barrier Reef Marine Park, Commonwealth Marine Areas, Listed Threatened Ecological communities, Listed Threatened Species and Listed Migratory Species. The only relevant categories to this report are:

- Threatened Ecological Communities
- Threatened species
- Migratory Species

Most of the migratory and aquatic bird species, as well as the fish, sharks and marine mammals are not assessed in this report. This report addresses terrestrial species, which are likely to have potential habitat on the site.

Eleven of the species from the targeted species are listed as Endangered or Vulnerable in the Federal EPBC Act. These species have been assessed under TSC Act criteria in this Flora and Fauna Impact Assessment report. The assessments concluded that no significant impacts are likely to occur to those species as a result of the proposal and a similar conclusion was also reached after consideration of the Commonwealth criteria. It is recommended that this proposal (see Map 6) does not need to be referred to Environment Australia.

4.6 Biodiversity Conservation Act BAM Threshold Assessment

This proposal (see Map 6) is **not** considered to meet the BC Act threshold as;

1) The amount of disturbance to native vegetation by this proposal is approximately 80 sqm below the threshold limit for this size of lot. There are no other lots involved in the DA. Therefore, this proposal does not trigger this threshold limit, **and**

2) The *Biodiversity Conservation Regulation 2017,* 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. The area of impact is **not** mapped on the "Biodiversity Values" Map as having high biodiversity values, as can be seen on Map 3, **and**
3) There is **not** likely to be a significant affect (5-part assessment of significance test Section 7.3, BC Act) on Threatened species or ecological communities or their habitats as has determined by this report. See Appendix A of this report for the 5-part test.

Therefore, the proposal **does not require a BAM assessment report (BDAR)** but does need a Flora and Fauna Report to address Council legislation and development controls, and section 79C of the EP&A Act.

The Biodiversity Assessment Method (BAM) has been used as guide for the field survey and vegetation assessment in this report, however, no offsetting is required.

4.7 Biodiversity Impact Conclusions

The ecological values on the site are shown in Map 5 and are described in section 3 of this report.

- The native species richness is low and reflects the disturbance of the vegetation.
- There is low quality fauna habitat on the site.
- The site does not contain any important habitat for Threatened species that occur in the locality. The site contains potential foraging habitat for highly mobile species with large home ranges such as large forest owls and microbats.
- The proposal will remove a small area approximately 80 sqm of disturbed exotic and native species in the slope location.
- The proposal is unlikely to have a significant impact to the local population of the Grey-headed Flying-fox or any other Threatened Species that may use this site as a large home range.
- The proposal is not considered to be a 'matter of National Environmental Significance (NES)' EPBC Act referral of the proposal to the Department of the Environment and Water Resources is not considered necessary.
- The ecological impact of the proposal is not likely to be an unacceptable impact by itself under Section 4.55 of the EPA Act or to have a significant impact under part 5A.
- The proposal as described in this report is not likely to have a significant effect to any threatened species or ecological community and none of the BC Act thresholds are met, therefore a Biodiversity Development Assessment Report (BDAR) is not recommended in relation to this proposal. It must be noted that this conclusion only applies to the proposal described in this report, the assumptions made in this report and the development shown on the Maps in this report. The recommendations below should be followed to further reduce the impact of the proposal on the ecological values within the study area.

5 Ameliorative Conditions & Recommendations

It is recommended that all ameliorative conditions and management recommendations in this report be followed to reduce disturbance during construction and to improve ecological outcomes.

The following ecological management actions should be carried out in accordance with a plan for the life of the development.

5.1 Prior to Construction

- Erosion and sediment controls are to be installed in accordance with Landcom's 'Managing Urban Stormwater: Soils and Construction'.
- Tree protection measures are to be implemented as per the Arboricultural Impact Assessment.

- All weeds should be removed from the property and controlled in the long-term. The general care duty in the Biosecurity Act (2015) requires that weeds should be controlled on all land in NSW.

5.2 During Construction

- Sediment control measures maintained and monitored.
- All weeds are to be removed from the site. There is to be ongoing weed control every 6-months during construction. Weed level control is achieve a percentage foliage cover of less than 5% in the ground layer and 0% in the shrub and tree layers. No soil should be left bare following weed removal.
- Revegetation of the slope with Littoral Rainforest species and the dune area with Spinifex Beach Strand Grassland species.
- landscaping on the property should be of suitable local native species.
- There is to be no machinery access, clearing native vegetation or dumping fill outside of development footprint.
- All material brought on site must be certified weed and disease free.

5.3 Ongoing Ecological Management

- Weeds are to be effectively controlled on the whole of the property for the life of the development using industry standard techniques.
- No Environmental weeds are to be planted on the property. It is recommended that any future planting is to be with species characteristic of littoral rainforest and sand dune vegetation.
- No pesticides, fertilizers or insecticides are to be used on the within the Development Site
- Motion sensing lights should not be used in outdoor lighting. No direct lights should be faced into adjacent native vegetation. Only minimal low lighting should be used outdoors to insure safety requirements.

6 General References

Australian Standard 4970 – 2009 Protection of Trees on Development Sites

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7 Appendix A: 5-part Tests of Significance

7.1 Making an assessment of significance

The threatened species assessment of significance should not be considered a 'pass or fail' test. Instead, consideration of the factors will inform the decision-making process of the likelihood of significant effect. Where necessary, the process will trigger further assessment.

All factors should be considered as well as any other information deemed relevant to the assessment. Application of the precautionary principle requires that a lack of scientific certainty about the potential impacts of an action does not itself justify a decision that the action is not likely to have a significant impact. If information is not available to conclusively determine that there will not be a significant impact on a threatened species, population or ecological community, or its habitat, then it should be assumed that a significant impact is likely and a species impact statement should be prepared.

Proposed measures that mitigate, improve or compensate for the action, development or activity should not be considered in determining the degree of the effect on threatened species, populations or ecological communities, unless the measure has been used successfully for that species in a similar situation.

In many cases where complex mitigating, ameliorative or compensatory measures are required, such as translocation, bush restoration or purchase of land, further assessment through the species impact statement process is likely to be required.

In determining the nature and magnitude of an impact, it is important to consider matters such as:

- *pre-construction, construction and occupation/maintenance phases,*
- *all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones,*
- *all direct and indirect impacts,*
- *the frequency and duration of each known or likely impact/action,*
- *the total impact which can be attributed to that action over the entire geographic area affected, and over time,*
- *the sensitivity of the receiving environment,*
- *the degree of confidence with which the impacts of the action are known and understood.*

7.1.1 Definitions needed for Assessment of Significance, 5-Part Test DECC 2006 Guidelines

Direct impacts *- are those that directly affect the habitat and individuals. They include, but are not limited to, death through predation, trampling, poisoning of the animal/plant itself and the removal of suitable habitat. When applying each factor, consideration must be given to all of the likely direct impacts of the proposed activity or development.*

Indirect impacts *- occur when project-related activities affect species, populations or ecological communities in a manner other than direct loss. Indirect impacts can include loss of individuals through starvation, exposure, predation by domestic and/or feral animals, loss of breeding opportunities, loss of shade/shelter, deleterious hydrological changes, increased soil salinity, erosion, inhibition of nitrogen fixation, weed invasion, fertiliser drift, or increased human activity within or directly adjacent to sensitive habitat areas. As with direct impacts, consideration must be given, when applying each factor, to all of the likely indirect impacts of the proposed activity or development.*

***Life cycle**: the series or stages of reproduction, growth, development, ageing and death of an organism.*

***Viable**: the capacity to successfully complete each stage of the life cycle under normal conditions.*

***Local population**: the population that occurs in the study area. The assessment of the local population may be extended to include individuals beyond the study area if it can be clearly demonstrated that contiguous or interconnecting parts of the population continue beyond the study area, according to the following definitions.*

- *The local population of a threatened plant species comprises those individuals occurring in the study area or the cluster of individuals that extend into habitat adjoining and contiguous with the study area that could reasonably be expected to be cross-pollinating with those in the study area.*
- *The local population of resident fauna species comprises those individuals known or likely to occur in the study area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the study area.*
- *The local population of migratory or nomadic fauna species comprises those individuals that are likely to occur in the study area from time to time. In cases where multiple populations occur in the study area, each population should be assessed separately.*

***Risk of extinction:** the likelihood that the local population will become extinct either in the short-term or in the long-term as a result of direct or indirect impacts on the viability of that population.*

***Local occurrence**: the ecological community that occurs within the study area. However, the local occurrence may include adjacent areas if the ecological community on the study area forms part of a larger contiguous area of that ecological community and the movement of individuals and exchange of genetic material across the boundary of the study area can be clearly demonstrated.*

***Risk of extinction**: similar to the meaning set out in factor (a), this is the likelihood that the local occurrence of the ecological community will become extinct either in the short-term or in the long-term as a result of direct or indirect impacts on the ecological community, and includes changes to ecological function.*

***Composition**: both the plant and animal species present, and the physical structure of the ecological community. Note that while many ecological communities are identified primarily by their vascular plant composition, an ecological community consists of all plants and animals as defined under the TSC and FM Acts that occur in that ecological community.*

***Habitat**: the area occupied, or periodically or occasionally occupied, by any threatened species, population or ecological community and includes all the different aspects (both biotic and abiotic) used by species during the different stages of their life cycles.*

***Extent:** the physical area removed and/or to the compositional components of the habitat and the degree to which each is affected.*

***Importance:** related to the stages of the species' life cycles and how reproductive success may be affected.*

***Locality:** the same meaning as ascribed to local population of a species or local occurrence of an ecological community.*

*"**likely**" with respect to "significant affect" the term "likely" in the context of s 78A(8)(b) of the EPA Act means a "**real chance or possibility**". It does not mean "more probable than not". Case law*

*"**significant**" qualifying the verb "**affect**" means "**important**", "**notable**", "**weighty**" or "**more than ordinary**". Case law*

7.2 5-Part Test of Significance for Grey-headed Flying-fox (*Pteropus poliocephalus*)

1) **The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:**

*a) in the case of a threatened species, whether the proposed development or activity is likely to have an **adverse effect on the life cycle** of the species such that a **viable local population** of the species is **likely to be placed at risk of extinction**,*

Response: There are seventy-three records of Grey-headed Flying-fox within 5km of the site on Bionet. The closest record is approximately 250m north-west of the site. The local population has a large home range and is likely to be viable. The nearest flying-fox camp to the site is in Warriewood Wetlands, approximately 10km south of the site. There is no roosting colony or camp on or adjacent to the site. No Grey-headed Flying-foxes were observed onsite during the survey. The Bangalow Palms could potentially provide foraging habitat for Grey-headed Flying-foxes.

The proposal will remove a small area, approximately 80 sqm of disturbed exotic and native species in the slope location. The proposal is unlikely to have a significant impact to the local population of the Grey-headed Flying-fox.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Response: This question is not applicable to the Threatened species, Grey-headed Flying-fox.

(c) in relation to the habitat of a threatened species or ecological community:

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

Response: The proposal will remove a small area, approximately 80 sqm of disturbed exotic and native species in the slope location. The proposal is unlikely to have a significant impact to the local population of the Grey-headed Flying-fox.

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

Response: Grey-headed Flying-foxes are highly mobile and the removal of a small amount habitat will unlikely restrict their movement.

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

Response: The proposal will remove a small area, approximately 80 sqm of disturbed exotic and native species in the slope location. The proposal is unlikely to have a significant impact to the local population of the Grey-headed Flying-fox.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

Response: The site is not mapped or defined as an Area of Outstanding Biodiversity Value. The proposal will unlikely directly or indirectly impact any Area of Outstanding Biodiversity Value.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

Response:

Key Threatening Processes that are listed in the Biodiversity Conservation Act 2016 and that are relevant to this site include:

Clearing of native vegetation.

The proposal will remove a small area, approximately 80 sqm of disturbed exotic and native species in the slope location. The proposal is unlikely to have a significant impact to the local population of the Grey-headed Flying-fox.

Conclusion to the 5-Part Test of Significance on the impact of the proposal on the Grey-headed Flying-fox.

The site contains potential foraging habitat for Grey-headed Flying-fox. The proposal will remove a small area, approximately 80 sqm of disturbed exotic and native species in the slope location. The site does not contain any roosting or breeding colony. The proposal is not likely to have a significant impact on the local population of the Grey-headed Flying-fox and a Biodiversity Development Assessment Report (BDAR) is not recommended.