Flora & Fauna Assessment

including BOS Threshold test

for a

Replacement house

At

78 Hudson Parade, Clareville

By

Nicholas Skelton, B. Sc. (Hons), M. App. Sc.

and

Sarah Tuxworth, B. Environmental Sc.

February 2019

Prepared for

Ben Nemeny

GIS Environmental Consultants

45 Austin Ave, North Curl Curl 2099
Ph: (02) 9939 5129 Fax: (02) 9401 0715 Mobile: 0419 438 672
Email: ecology@ecology.net.au Web: www.ecology.net.au

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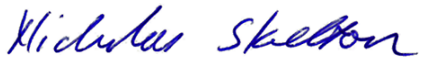

Nicholas Skelton, B.Sc. (Hons), M. App. Sc.
GIS Environmental Consultants

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GIS Environmental Consultants
45 Austin Ave, North Curl Curl, NSW 2099
Phone: (02) 9939 5129
Mobile: 0419 438 672
Email: ecology@ecology.net.au
Web: www.ecology.net.au

1 Introduction

1.1 Background

This report describes the ecological values and constraints at the Study Site, Lot 2 DP221631 known as 78 Hudson Parade, Clareville, in the Northern Beaches Local Government Area. The importance of the land to the conservation of Threatened flora and fauna species, and ecological communities and the significance of the likely impacts of the proposed development on terrestrial biodiversity are assessed as required by Federal, State and Local Government legislation.

An accurate description of the flora and fauna is required when submitting Development Applications to allow assessment of the application in relation to the following State legislation; the NSW *Environmental Planning and Assessment Act 1979*, *Fisheries Management Act 1994*, the *Biodiversity Conservation Act 2016* and the Federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999). In addition, the information in this report is also likely to be needed to assess the development with respect to other acts, SEPPs, local government, LEPs, DCPs, regulations, orders and policies.

1.1 Aims of this Report

The aims of this flora and fauna assessment are to:

- Record the **findings of an ecological survey** (flora, fauna and ecological communities and their habitats) in the area likely to be impacted by the proposal;
- 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;
- Provide **ecological information** to allow assessment and determination of compliance with relevant NSW legislation including; Acts, regulations SEPPs, LEP and DCPs;
- **Assess** the likely **ecological impact** of the proposal on the ecology 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;
- 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 **referral** to the Federal government for assessment under the EPBC Act;
- Recommend ways the ecological **impacts** can be further **ameliorated**, by plan actions during construction and for the life of the development.

1.2 Legislation Addressed by the Report

1.2.1 Environment Planning and Assessment Act 1979

The NSW Environment Planning and Assessment Act 1979 is the framework for approval of development in NSW. Section 4.15 (formerly 79C) of the Act requires that consent authorities must take into consideration any environmental planning instruments, LEP, DCP, SEPPs and regulations.

Section 4.15 (b) (formerly 79C (b)) requires the assessment of the likely impacts of that 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.

The proposed development will be assessed under Part 4 of the NSW Environmental Planning and Assessment Act.

1.2.2 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 endangered ecological communities in NSW and the regulation for the Act requires that a threshold test be applied to Development Applications. A Test of significance is required to be undertaken for all Threatened species or ecological communities that may have suitable habitat impacted by the proposal. If any of the triggers in the threshold are 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 (formerly 79C) of the EP&A Act, SEPP and LEP/DCP requirements..

1.2.3 Northern Beaches Council, Pittwater LEP 2014 and DCP 2014

The study area is zoned as Part E4 -Environmental Living.

The parts of PLEP 2014 and DCP 2014 relevant to the proposed development are as follows:

PLEP - 7.6 Biodiversity Protection

The site is mapped as containing "Biodiversity" on the *Biodiversity Map* and therefore section 7.6 *Biodiversity Protection* of the LEP applies to this proposal.

PDCP- Clause B4.7 Pittwater Spotted Gum Forest

The site contains remnant Pittwater and Wagstaffe Spotted Gum Forest Endangered Ecological Community, therefore Clause B4.7 of the Pittwater DCP applies.

1.2.4 Federal Environment Protection and Biodiversity Conservation Act, EPBC Act

This report also identifies "matters of national environmental significance", relevant to the site that are listed under Part 13 Division 1 of the *Environment Protection & Biodiversity Conservation 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 any "matters of national environmental significance". In determining whether a "significant impact" will occur, consideration is given to the 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".

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.

This report addresses the requirements of this legislation.

1.3 Definitions and Acronyms

5-Part 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.

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 is the ecological survey and assessment technique that is required to be used for the BOS and it is described in a document by Office of Environment and Heritage August 2017 and referred to by the BC Act regulation. The Biodiversity Assessment Reports (**BAR**) that the BAM methods produces are a **BDAR**, **BSSAR** and a **BCAR**.

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.

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

DCP - Development Control Plan, a local planning instrument for each LGA.

Direct Impacts - are 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)

DPI – NSW government of Department of Primary Industries

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

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.

LGA- Local Government Area.

OEH – NSW Office of Environment and Heritage, formerly NPWS, DEC, DECC and DECCW. Department responsible for the conservation of native flora and fauna.

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 - means 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 - means the area directly affected by the proposal (DECC 2006).

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".

The Impact Mitigation Hierarchy

In managing adverse impacts on Biodiversity from development, an important frameworks is required this is called the mitigation hierarchy where the proponent needs to consider, in order, actions to avoid, mitigate and offset impacts.

The Chief Justice of the NSW Land and Environment Court has made the following statement (Preston, B J, Biodiversity offsets: adequacy and efficacy in theory and practice (2016) 33 EPLJ 93 at 95-96)

Avoidance and mitigation measures should be the priority strategies for managing the potential adverse impacts of a proposed development. Avoidance and mitigation measures directly reduce the scale and intensity of the potential impacts of the development. Only then are offsets used to address the residual impacts that remain after avoidance and mitigation measures have been put in place. Adherence to the mitigation hierarchy is central to biodiversity offsetting. Without prior application of the mitigation hierarchy, conservation actions would not qualify as offsets.

Application of the mitigation hierarchy is described in the LEC cases Bulga Milbrodale progress Association Inc v Minister for Planning and Infrastructure and Warkworth Mining Limited 2013 NSW LEC 48 (Bulga) at 147 – 153.

1.4 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 to the proposal that changes the ecological impact, 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.
- 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 only rarely. The conclusions drawn in this report are a result of testing, observation and experience.
- 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.
- 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.

1.5 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 Sydney. 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. Nick was the principle ecologist on all field surveys and was responsible for map making and report editing. Further details can be found at www.ecology.net.au.

Sarah Tuxworth has a Bachelor of Environmental Science (ACU). Sarah has been working with GIS Environmental Consultants for 1 year and has assisted in many ecological surveys and writing of reports.

2 The Site and Locality

2.1 Locality and Adjacent Ecological Values

The adjacent allotments to the north, east and south are zoned E4 Environmental Living and contain single residential dwellings with some patches of bushland within the properties. Pittwater estuary abuts the western boundary of the property. The lot layout in the locality is shown on Maps 1 and 2. There are many remnant canopy trees in the area connecting the canopy on the site to Angophora Reserve. The proximity of the site to nearby bushland is shown on Maps 2 and 4.

Map 4 shows the vegetation types (ecological communities) in the locality that have been mapped at the regional scale (Native Vegetation of the Sydney Metropolitan Area V3 2016). This map is a compilation of the best available vegetation maps by various authors. The site and adjacent properties east, west and south are mapped as containing Pittwater Wagstaffe Spotted Gum Forest (S_WSF11, PCT 1214). Other mapped vegetation communities near the property are Coastal Escarpment Littoral Rainforest (south-west of site, S_RF07), Coastal Flats Swamp Mahogany Forest (west of site, S_FoW02) and Seagrass Meadows (east of site, S_SW03).

2.2 Description of the Study Site

For this proposal the Subject Site (Site), Property and Study Area are the same and are the whole of Lot 2 DP221631, known as 78 Hudson Parade, Clareville in the Northern Beaches Local Government Area. The Site is 0.14ha in size and is generally a long trapezium in shape, see aerial photo of the Site on Map 1. Map 2 shows an aerial photo of the locality , Map 3 shows the topography, contours, drainage, roads and other relevant features in the locality, Map 4 shows the mapped vegetation types and soils in the locality, Map 5 shows the Threatened Species records in the locality and habitats and Map 6 is the site survey showing the locations of the existing and proposed buildings, trees and levels. The property contains an existing dwelling, garage, boatshed, stairway and boat ramp. The site contains several large mostly local native canopy trees with a disturbed grassy and weedy understorey. A stairway leads west from the house down to the foreshore where there is a small grassed area adjacent to the boatshed. At the western edge of the property is a small tidal beach. There is a concrete boat ramp at the western end of the property running from the boat shed and into the water. The western boundary of the property is the Mean High Water Mark.

2.2.1 Geographic co-ordinates

The latitude and longitude of the study site is -33.633174° S and 151.313259°E

2.2.2 Topography

The Site slopes gradually to the west before dropping off steeply close to the foreshore. 10 m contours and the locality of the site are shown in pink on Map 3.

2.2.3 Drainage

There are no permanent drainage lines or other waterbodies on the site. Stormwater on the site flows to west into Pittwater. Drainage in the locality is shown in light blue on Maps 2, 3 and 4.

2.2.4 Riparian Land

The Site occurs on the foreshore of Pittwater estuary and the *Guidelines for Riparian Corridors on Waterfront Land* (Office of Water DPI 2012) recommend that the Vegetation Riparian Zone for estuaries be 40m from the top of bank (Mean High Water Mark, western boundary of the property). The Vegetated Riparian Zone comes approximately halfway up the property. Construction of a single residential dwelling and associated works is exempt under the Water Management Act 2000 and does not require a Controlled Activity Approval for works within a Vegetated Riparian Zone.

2.2.5 Geology and Soils

The property is on Watagan soil type (Soils Sydney ed4 DPI). The boundaries of soil types in the locality are shown by the thick light blue line on Map 4.

2.2.6 Fire History

The vegetation on the site shows signs of not having been burnt for more than 30 years.

Map 1. Study Site, Aerial Photo

78 Hudson Prd, Clareville

Date: 04/02/2019

Legend

78 Hudson Prd

N

0 4.5 9 18 Meters

Disclaimer: Mapping is indicative and may contain errors from the source of the data. Information on these maps should only be used at the scale provided. Dimensions need to be determined by a registered surveyor.

GIS Environmental Consultants
Ph: (02) 9939 5129, Mobile: 0419 438 672
ecology@ecology.net.au, ecology.net.au

Map 2.
Locality Aerial Photograph

78 Hudson Prd, Clareville

Date: 03/02/2019

Legend

Buffer 1500m

78 Hudson Prd

N

0 125 250 500 Meters

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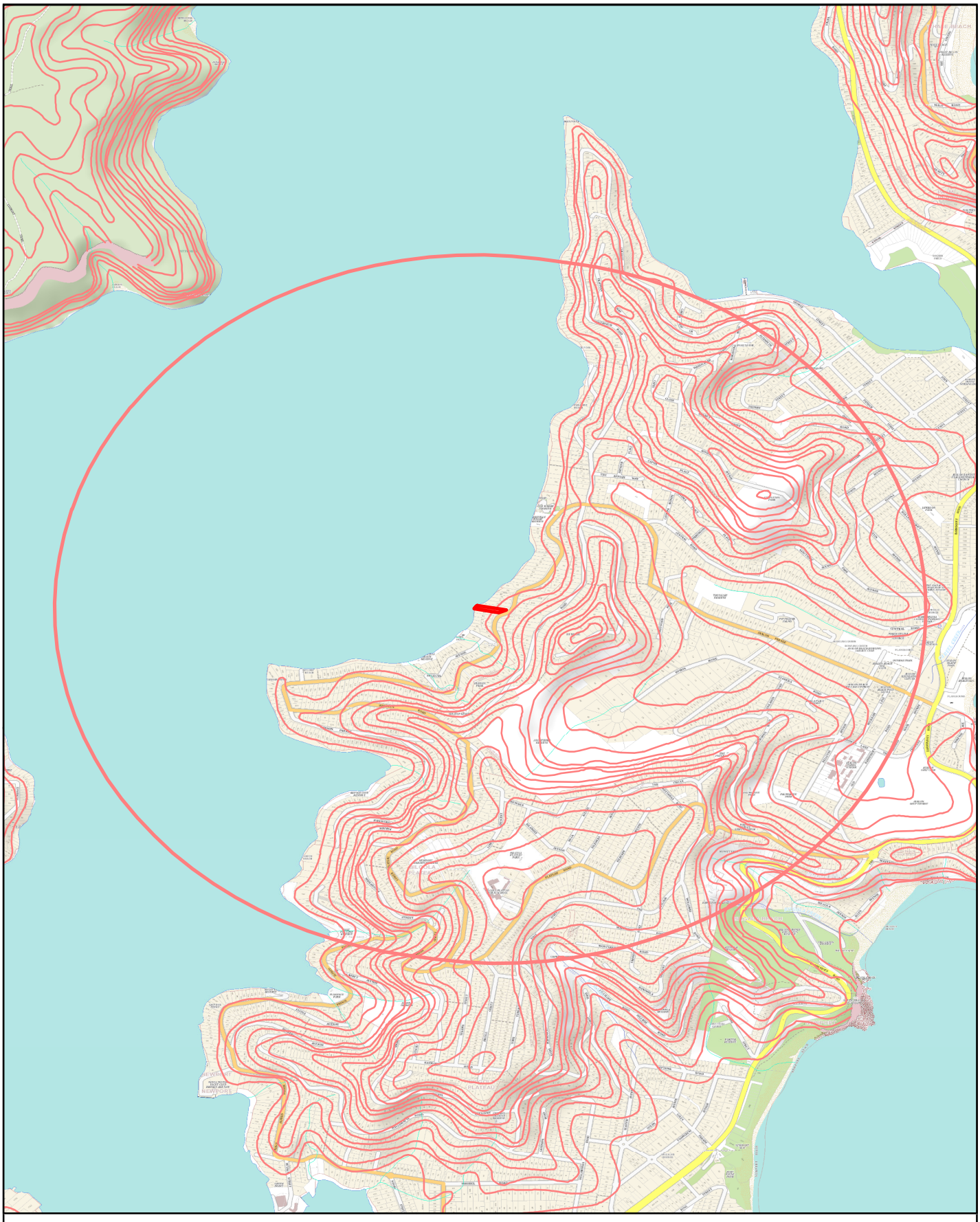


Legend

- Buffer 1500m
- 78 Hudson Prd
- Contours 10m

Map 3.
Locality, Topography and Features

78 Hudson Prd, Clareville

Date: 03/02/2019

N

0 125 250 500 Meters

GIS Environmental Consultants
Ph: (02) 9939 5129, Mobile: 0419 438 672
ecology@ecology.net.au, ecology.net.au

2.3 The Proposal

The proposal is for a:

- Demolition of existing dwelling and garage
- Construction of new dwelling and garage
- Altering the driveway footprint
- Removal and disturbance of native vegetation including 8 native trees (see section 4.1.2 for details)
- Addition of a small pool
- Revegetation of 430m^2 as Pittwater Spotted Gum Forest
- Landscaping
- The proposal will not remove the existing boat shed but the existing roof will be replaced. There are no proposal works on the beach at the western end of the property.

The proposal is shown on Map 6. The site is not mapped as bushfire prone land and impacts for an APZ are not assessed.

Connection to sewerage is available.

2.3.1 Revegetation Areas

After extensive discussion with the Landscape Architect a 355m^2 area at the front of the property and a 75m^2 area in the eastern section of the property, north of the stairs leading down to the foreshore, will be managed as revegetation areas, see Map 6. The suitable species for planting are shown in Appendix B and the planting specifications are described in section 6.3. The landscape plan is in keeping with appropriate management of the Pittwater Wagstaffe Spotted Gum Forest.

2.4 Plans and Documents Used for this Report

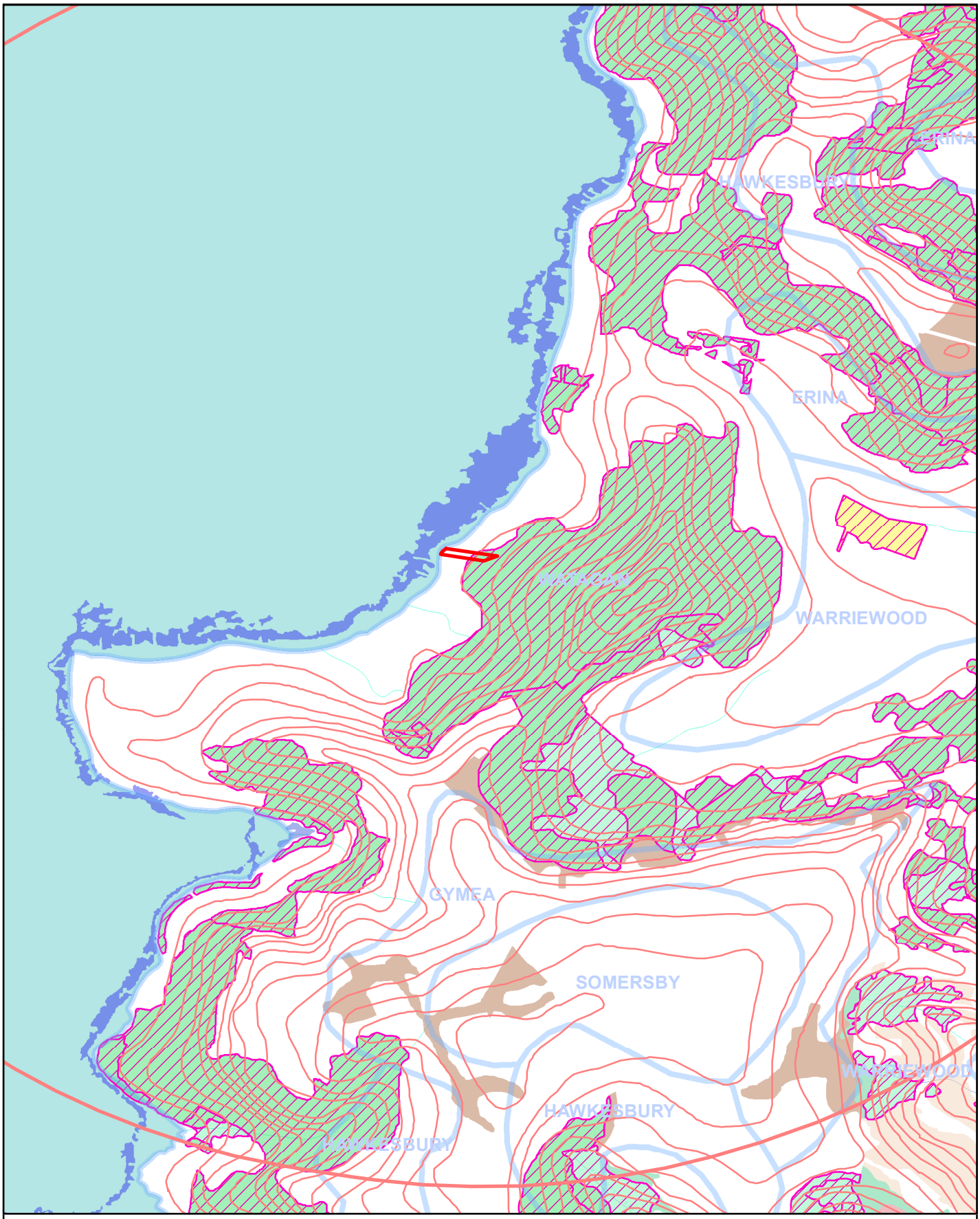
Title	Author	Rev	DWG./Doc. No./Ref.	Date
Proposed Roof Plan	Marker Architecture and Design	02	DA04	16/01/19
Landscape Master Plan	Landart	A	LMP01	22/1/19
Landscape Planting Plan	Landart	A	LPP01	22/1/19
Landscape Master Plan	Landart	A	LMP02	22/1/19
Landscape Planting Plan	Landart	A	LPP02	22/1/19
Aboricultural Impact Assessment	Standfast Tree Services	-	-	13/12/18

3 Methods

3.1 Literature and Database Search

Relevant information was obtained from literature, local knowledge and established sources such as scientific journals, electronic databases and reports. The data in databases that were consulted included BioNet (5km search area) (including NPWS Atlas of NSW Wildlife records, Australian Museum specimen records and the Royal Botanic Gardens records), BAM Calculator, 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 in or near the study area. Map 5 shows the Threatened species that have been recorded near the and the date of recording. The data from within a 5km search area were then combined with local knowledge and the habitat conditions within the study area to compile a list of Threatened plant and animal species for specific targeting during the fieldwork. These are listed in Table 1 and 2.



Legend

- Buffer 1500m
- 78 Hudson Prd
- Contours 10m
- Soils Sydney ed4

Threatened Vegetation Communities

Threatened Ecological Community

- Littoral Rainforest
- Pittwater Spotted Gum Forest
- Swamp Sclerophyll Forest on Coastal Floodplains

Vegetation Communities in Locality

- S_DSF04: Coastal Enriched Sandstone Dry Forest
- S_DSF06: Coastal Sandstone Foreshores Forest
- S_FoW02: Coastal Flats Swamp Mahogany Forest
- S_HL01: Coastal Headland Clay Heath
- S_RF07: Coastal Escarpment Littoral Rainforest
- S_SW01: Estuarine Mangrove Forest
- S_SW03: Seagrass Meadows
- S_WSF11: Pittwater Spotted Gum Forest
- S_WSF33: Central Coast Escarpment Moist Forest

Map 4.
Locality Mapped Vegetation Types & Soils

Vegetation Data from; The Native Vegetation of the Sydney Metropolitan Area V3 2016

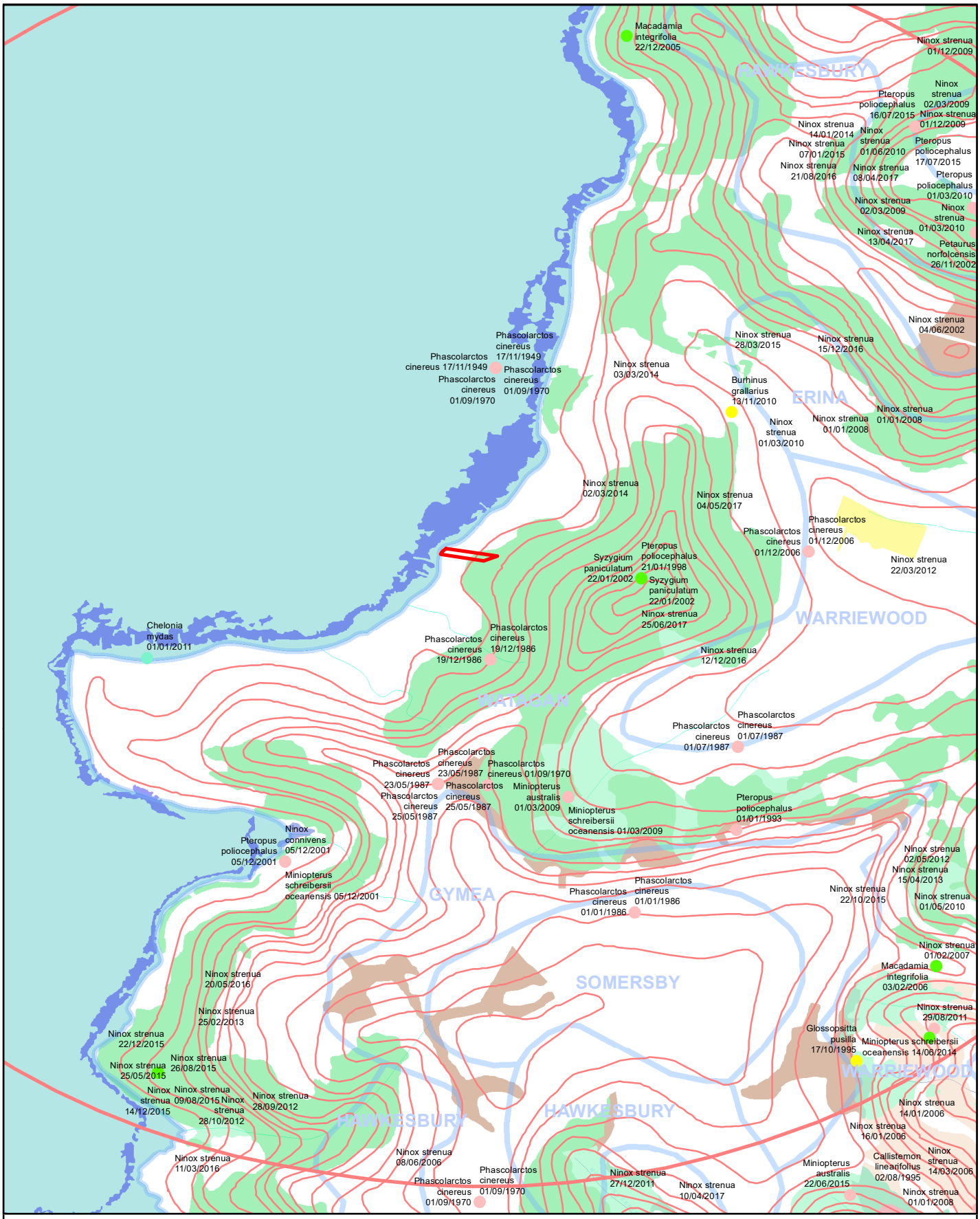
78 Hudson Prd, Clareville

Date: 03/02/2019

N

0 70 140 280 Meters

GIS Environmental Consultants
Ph: (02) 9939 5129, Mobile: 0419 438 672
ecology@ecology.net.au, ecology.net.au



Legend

Threatened Species Records

- Plant
- Bird
- Mammal
- Reptile
- Sensitive Species (Not Shown)
- Buffer 1500m
- 78 Hudson Prd
- Contours 10m
- Soils Sydney ed4

Threatened species records from NSW Office of Environment and Heritage BioNet Atlas which holds data from a number of custodians.

Map 5.
Threatened Species and Habitat

Vegetation Data from; The Native Vegetation of the Sydney Metropolitan Area V3 2016

78 Hudson Prd, Clareville

Date: 03/02/2019

N

0 70 140 280 Meters

GIS Environmental Consultants
Ph: (02) 9939 5129, Mobile: 0419 438 672
ecology@ecology.net.au, ecology.net.au

3.2 Targeted Threatened Species

Table 1: Targeted Threatened Flora Species

Genus and Species	Common Name	BC Act status	EPBC Act status	BioNet records within 5 km
Callistemon linearifolius	Netted Bottle Brush	V,3		4
Eucalyptus camfieldii	Camfield's Stringybark	V	V	7
Persoonia hirsuta	Hairy Geebung	E1,P,3	E	5
Pimelea curviflora var. curviflora	Curved Rice Flower	V	V	1
Syzygium paniculatum	Magenta Lilly Pilly	E1	V	16

Table 2: Targeted Threatened Fauna Species

Class	Common Name	Genus and Species	BC Act status	EPBC Act status	Bionet records within 5 km
Amphibia	Giant Burrowing Frog	*Heleioporus australiacus*	V,P	V	15
Amphibia	Red-crowned Toadlet	*Pseudophryne australis*	V,P		28
Aves	Barking Owl	*Ninox connivens*	V,P,3		17
Aves	Bush Stone-curlew	*Burhinus grallarius*	E1,P		45
Aves	Eastern Osprey	*Pandion cristatus*	V,P,3		3
Aves	Gang-gang Cockatoo	*Callocephalon fimbriatum*	V,P,3		1
Aves	Glossy Black-Cockatoo	*Calyptorhynchus lathami*	V,P,2		45
Aves	Little Lorikeet	*Glossopsitta pusilla*	V,P		6
Aves	Powerful Owl	*Ninox strenua*	V,P,3		188
Aves	Superb Fruit Dove	*Ptilinopus superbus*	V,P		1
Aves	White-bellied Sea-Eagle	*Haliaeetus leucogaster*	V,P	C	37
Mammalia	Eastern Bentwing-bat	*Miniopterus schreibersii oceanensis*	V,P		22
Mammalia	Eastern Pygmy Possum	*Cercartetus nanus*	V,P		42
Mammalia	Grey-headed Flying-fox	*Pteropus poliocephalus*	V,P	V	44
Mammalia	Koala	*Phascolarctos cinereus*	V,P	V	75
Mammalia	Little Bentwing-bat	*Miniopterus australis*	V,P		15
Mammalia	Southern Brown Bandicoot (eastern)	*Isoodon obesulus obesulus*	E1,P	E	34
Mammalia	Southern Myotis	*Myotis macropus*	V,P		7
Mammalia	Spotted-tailed Quoll	*Dasyurus maculatus*	V,P	E	3
Mammalia	Squirrel Glider	*Petaurus norfolcensis*	V,P		3
Reptilia	Rosenberg's Goanna	*Varanus rosenbergi*	V,P		10

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).
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).

3.3 Field Survey

During the field surveys, all sections of the study area and some of the surrounding land were traversed on foot. The landscape features, vegetation type (PCT) and condition were surveyed using the Biodiversity Assessment Method (BAM). 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;
- Mapping the extent of the existing vegetation;
- 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;

3.3.1 Determining Plant Community Type (PCT)

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 vegetation classification titled The Native Vegetation of the Sydney Metropolitan Area V3 Volume 2 (OEH 2016) and the PCT vegetation type database. A detailed description of how the importance of the habitat for Threatened Ecological Communities (EEC) within the study area was determined is given in Section 5.4.

3.3.2 Field Survey Effort

Date	Person Hours	Weather	Type	Location
12th October 2018	3 hrs	13-19°C Recent Showers	Random meander/ Site constraints	Across the entire Study Area
12th October 2018	4hrs	13-19°C Recent Showers	Targeted threatened species/habitat search	Across the entire Study Area

4 Findings

4.1 Existing Habitat

The Site contains medium value habitat for a range of native species. There are many weeds and exotic species on the site that are likely to be have been planted, bird dispersed, or resulted from nutrient runoff from exotic gardens in the upslope urban environment. The site has not been burnt for decades, which had reduced the species richness.

There is a garage at the eastern section of the property that is potential habitat for some microbat species but there was no evidence the Site ever being used by bats. The foreshore beach and adjacent estuarine environment also provides habitat for the native Water Rat and native estuarine birds.

The Aboricultural Impact Assessment (Standfast Tree Services 13/12/18) assessed 36 trees on the site. Twelve of the trees are local native species. The native tree canopy across the majority of the site provides habitat for native arboreal mammals (Ring-tail and Brushtail Possums, Gliders) and birds and foraging habitat for bats.

There is a large amount of woody debris and leaf litter which is habitat for insects/molluscs, small reptiles and Australian Brush turkey. Bandicoot diggings were observed in the south-east corner of the site.

The Site and the locality are shown on Maps 1 to 6 and can be seen on the cover image of this report.

4.1.1 Habitat Trees

Four (4) of the trees on the Site were observed as containing hollows (see summary below) and additional trees may contain hollows where the hollows are not visible from the ground.

One of the hollow bearing trees (T26) had scratches along the trunk that were most likely from a Brushtail Possum. There was no evidence of gliders using the trees for sap.

Summary of Hollows

Hollow Number	Tree Number (See Arborist Report)	Description
H1	T21 *Corymbia maculata*	Approximately 20m high, upward facing and 15cm in diameter
H2	T23, *Eucalyptus botryoides*	2m high, 7x5cm in width, deep both up and down the truck.

		Bark worn around hollow entrance. Inspected with endoscope and no signs of use.
H3	T26, *Corymbia maculata*	North facing, approx. 10m high and 20cm in width. Many scratches on tree, likely from possum.

4.2 Threatened Species

No threatened flora and fauna species were observed on or adjacent to the site during the survey. Highly mobile Threatened fauna species that occur in the locality may use this site as part of a large home range. The likelihood of targeted threatened flora and fauna species occurring on the study area is assessed in Tables 8 and 9.

4.3 Non-threatened Fauna

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

Table 3: Non-threatened Fauna Found

Common Name	Scientific Name	Evidence
Aves		
Australian Magpie	*Gymnorhina tibicen*	Observed
Black Cormorant	*Phalacrocorax sulcirostris*	Observed
Noisy Miner	*Manorina melanocephala*	Observed
Pacific Black Duck	*Anas superciliosa*	Observed
Sulphur-Crested Cockatoo	*Cacatua galerita*	Heard
Rainbow Lorikeet	*Trichoglossus haematodus*	Observed
Laughing Kookaburra	*Dacelo novaeguineae*	Observed
Reptiles		
Garden Skink	*Lampropholis guichenoti*	Observed
Mammals		
Long-nosed Bandicoot	*Perameles nasuta*	Diggings
Water Rat	*Hydromys chrysogaster*	Tracks

4.4 Presence of Threatened Ecological Communities

4.4.1 Threatened Ecological Communities in the Locality

The NSW Biodiversity Conservation Act, 2016 lists Threatened Ecological Communities (TECs) and Threatened Species that are likely to become extinct in nature unless the circumstances and factors threatening their survival cease to operate. The Threatened communities that occur in the locality are shown on Map 4. Two of the main determinants of habitat quality are the type of habitat and proximity to hydrological features, these are shown on Map 3 to assist extrapolation. Other biotic and abiotic environmental habitat features such as soil type, topography and drainage are also shown on Map 3. These factors were used to determine Threatened Ecological Communities and species to target during the field survey.

4.4.2 Method of Establishing if EEC's Occur on this Study area

To establish if any Endangered ecological community occurs within the study area and combination of three separate methods were used:

Mapping Method: The most accurate and up-to-date vegetation maps that are available were used to determine what is already known about the distribution of vegetation types in the locality. Where more accurate local maps are not available, the 'Vegetation of the Sydney Metropolitan Area' map and classification (OEH, 2016) are used. Vegetation mapping has inherent errors such as classification accuracy is limited due to the amount of field verification that was carried out when they were made, the spatial accuracy of the mapping and how old the mapping is. Vegetation maps do not provide a sufficient level of spatial accuracy for the assessment of the impact at the scale of this proposal but are useful in determining the ecological communities that are likely to occur in the vicinity. Fieldwork is necessary to determine the site-specific accurate vegetation mapping.

Correlation Method: Correlations between the species that occur in the study area and the listed characteristic species for the Endangered Ecological Community in; the Final Determination in Part 3 of Schedule 1 of the Threatened Species Conservation Act (1995). The floristics were also compared to the document 'Vegetation of the Sydney Metropolitan Area V3' by OEH 2016.

Comparison Method: Comparison of the ecological features on the site to the environmental description in the legal definition of the Threatened Ecological Community in the Final Determination in Biodiversity Conservation Act (2016). This comparison is essential when determining if the type of ecological community that occurs within a study area is an endangered community. Not all the sections of the determinations need to apply to the study area and the earlier sections are more important and should be given more weight (Preston and Adams).

4.4.3 Occurrence of TECs in this Study Area

Mapping Result

The Site and adjacent land has been mapped as containing Pittwater and Wagstaffe Spotted Gum Forest, that is listed as an Endangered Ecological Community in schedule 2 of the BC Act. No other EECs have been mapped nearby on similar environmental features, see Maps 3 and 4.

Correlation Result – Listed Characteristic Species within the TSC Final Determination

The vegetation on the Site contains very little local native shrub and groundcover species. The Site contains a remnant native tree canopy that are comprised of the species *Corymbia maculata* (Spotted Gum), *Glochidion ferdinandi* (Cheese Tree), *Eucalyptus panicultata, Eucalyptus botryoides* which are characteristic species of PWSGF EEC listed in section 2 of the Final Determination.

Comparison Result – Ecological Features within the TSC Final Determination

The NSW Scientific Committee Final Determination listed Pittwater and Wagstaffe Spotted Gum Forest as an Endangered Ecological Community has 14 Sections of which sections 2, 5 and 8 are the most useful in determining the likely presence of PWSGF EEC.

Section 2- Floristics- See above

Section 5- Soils and Location- The site has the correct soil type and is in the correct LGA to support PWSGF EEC.

Section 8- Structure- Section 8 states that "*the structure of Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion was originally open-forest however, it now exists outside of reserves as woodland or remnant trees with few large stands remaining."* The remnant characteristic trees on this site fit this description of PWSGF EEC.

The site does fit the structure or topography of the Endangered Ecological Communities mapped in the locality of the site.

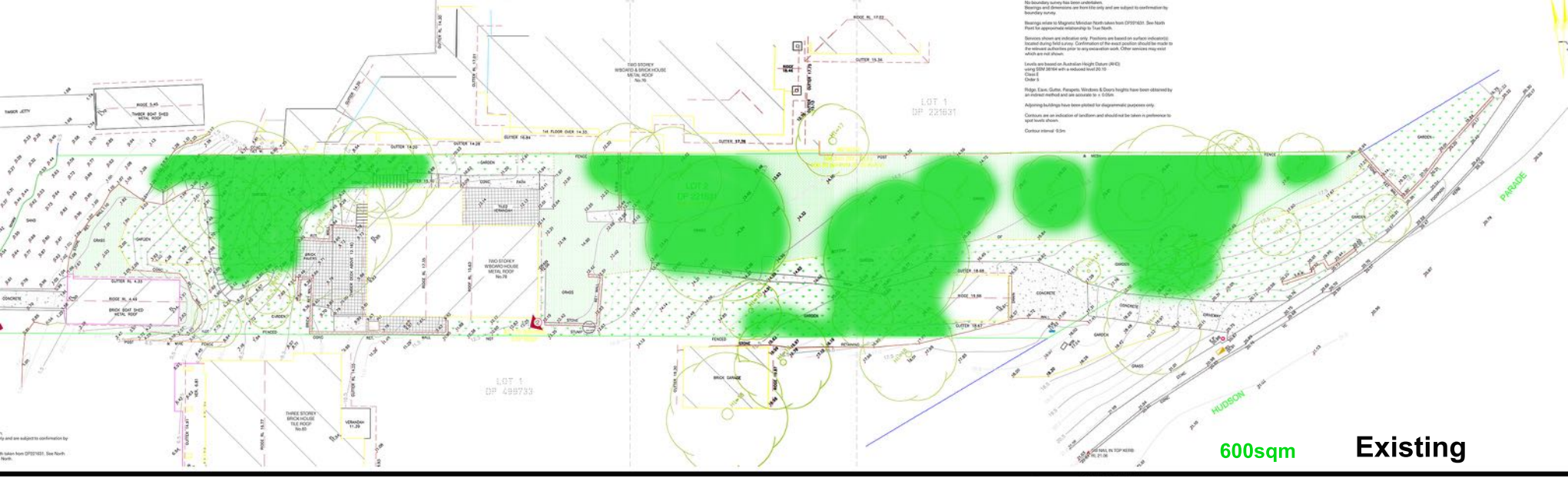
Conclusion regarding occurrence of TECs on the Site

The vegetation on the site fits the description of the Pittwater Wagstaffe Spotted Gum Forest Endangered Ecological Community as described in the Final Determination and the Site contains a remanent characteristic tree canopy.

4.5 Native Vegetation Types Present

The Site is mapped as containing Pittwater Spotted Gum Forest (PCT 1214, Pittwater and Wagstaffe Spotted Gum Forest EEC). Pittwater Spotted Gum Forest is described in the Native Vegetation of the Sydney Metropolitan Area (V3, 2016) as a tall open forest occurring in the Pittwater peninsular. The canopy is dominated by the distinctive Spotted Gum (*Corymbia maculata*) and may also include Grey Ironbark (*Eucalyptus paniculata*) and Broad-leaved White Mahogany (*Eucalyptus umbra*). The midstorey is usually composed of mixed layer of mesic and dry shrub species and occasional palms such as Blueberry Ash (*Elaeocarpus reticulatus*), Scentless Rosewood (*Synoum glandulosum subsp. glandulosum*), narrow-leaved geebung (*Persoonia linearis*) and mountain holly (*Podolobium ilicifolium*). The Site contains a tree canopy of Spotted Gums (*Corymbia maculata*) and the ground cover is mostly mown lawn and exotic species. When the biotic and abiotic features are taken into consideration the site is considered to contain a degraded form of Pittwater Spotted Gum Forest.

No other native vegetation community occurs on the site.



Map 6
Change in Ecological Value

5 Impact Assessment

5.1 Direct and Indirect Impacts

5.1.1 Steps Taken to Avoid and Minimise Ecological Impact

The Biodiversity Conservation Act 2016 (Biodiversity Conservation Regulations 2017) requires that all developments be planned using the impact avoidance hierarchy, which is Development Applications must "Avoid" then "Minimise" ecological impacts. Once all possible impact minimisation and avoidance has been undertaken, then offsetting can be used to mitigate the remaining impacts of the proposal on the environment. This report describes the ecological constraints present on this site for the use in planning the proposal.

The main ecological constraints that have been identified on this site are the Endangered Ecological Community (Pittwater and Wagstaffe Spotted Gum Forest) that is represented on the site by large remnant canopy trees and fauna habitat hollows.

Due to the small lot size and the high amount of native trees at the site there is a limit to what can be done to avoid impact. There was a preliminary constraints meeting held onsite with the architect to determine the ecological constraints at the site and discuss the proposal. The meeting resulted in a preliminary ecological constraints letter (dated 16th October 2018) that was sent to the architect to assist in the design stage.

Extensive discussions were held with the Landscape Architect to reduce the impact of the landscaping and replace landscaping with Pittwater Wagstaffe Spotted Gum Forest revegetation are. Further reccomendations are provided in Appendix A and recommendation section in this report.

The proposal will remove 1 of the three hollows identified onsite, and 8 of the 23 PWSGF EEC trees on the site. Offset tree planting is proposed at a ratio of 3:1 for the loss of PWSGF EEC trees and the planting of PWSGF EEC understorey species and weed control to improve the condition of the vegetation and the habitat value of the Revegetation Area, as shown in the landscape plan.

Recommendations have been made in the *Ameliorative Conditions and Recommendations* section of this report to minimise the ecological impact from the proposal.

5.1.2 Vegetation and Tree Loss

The proposal is for the replacement of the existing dwelling within the a new dwelling, swimming pool and reconfiguring the driveway. Map 6 shows the oextent of the existing highly disturbed Pittwater Wagstaffe Spotted Gum Forest habitat on the Site in green and the proposed revegetation habitat areas shown in green.

The Aboricultural Impact Assessment (Standfast Tree Services, 13/12/18) identified 36 trees on the site of which, 23 are trees that are characteristic species listed in the Final Determination for Pittwater and Wagstaffe Spotted Gum Forest Endangered Ecological Community. Characteristic PWSGF EEC species that occur on the site in *Corymbia maculata* (Spotted Gum), *Eucalyptus paniculata* (Grey Ironbark), *Eucalyptus botryoides* (Bangalay) and *Glochidion ferdinandi* (Cheese Tree).

The Aboricultural Impact Assessment identified 8 native trees that require removal, all of which are characteristic PWSGF EEC including 5 *Corymbia maculata,* 1 *Eucalyptus botryoides,* 1 *Glochidion ferdinandi* and 1 *Eucalyptus paniculata.*

The understorey in the footprint of the proposed driveway, dwelling, pool and hard landscaping will be removed. These parts of the site are under the canopy of remnant PWSGF EEC trees and are therefore considered to be part of the community, however, the understorey is currently highly disturbed and contains mostly exotic species, with some scattered natives. The majority of the soft landscaped parts of the site will have the exotic and weed species removed and planted with local native PWSGF EEC understorey species planted as per the requirements specified in this report.

5.1.3 Impact to Other Habitat Values

The proposal will remove one hollow bearing tree (T23, *Eucalyptus botryoides*). The tree contains a hollow with a small entrance (7x5cm) and goes deep into the trunk both up and down the tree. The hollow is potentially suitable for microbats or gliders and Pygmy Possums. The hollow was inspected with an endoscope and there were no signs of use.

There are some minor works proposed along the foreshore part of the property including the replacement of the boatshed roof, sandstone steps and a ladder down to the beach. This is unlikely to impact the foreshore habitat. There are no proposed works on the beach.

This Site has highly erodible soil and the steep slope will erode if soil is left bare. It is possible that sediment leaving the site will impact the downhill estuarine environment. Appropriate sediment control will need to be in place for the entire length of construction and soil in the landscape area is not to be left bare.

5.1.4 Impact on Wildlife Corridor

The tree canopy on the site is connected to other remnant tree canopy in the locality including Angophora Reserve to the south, allowing access for arboreal fauna to and from the site. The proposal will maintain a continuous tree canopy across the site in a north-south direction.

Access will be maintained for possums, birds, bandicoots and brush turkey to and from this property to neighbouring properties to the north and south.

There will be no changes to the effectiveness of the wildlife corridor along the foreshore of the property.

There is to be planting of local native PWSGF EEC species in the Revegetation Areas of the property to improve corridor and habitat value. The planting will include replacement tree canopy planting at a ratio 3:1 (tree planted: tree loss).

5.2 Assessment of Likely Occurrence and Impacts to Threatened Flora

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

Table 6: Habitat Suitability for Targeted Threatened Flora Species

Scientific Name	Habitat Preference	Likelihood of Occurrence
Callistemon linearifolius	This species is mainly confined to Hawkesbury Sandstone, however isolated specimens have been observed between Sydney and Nelson Bay. Found in damp places in woodland and sclerophyll forest usually in gullies. (Warringah Pittwater Bush Fire Management Plan, 2000).	**Local Occurrence**: Low likelihood. No records within 1 km of the site. Not found during survey. Site was adequately searched. **Habitat Value**: low suitable habitat occurs within study site. **Direct and Indirect Impacts**: Unlikely. **Conclusion**: No further assessment required.
Eucalyptus camfieldii	Records from St Ives, Gordon, Turramurra, East Killara, Duffy's Forest Galston Rd Hornsby, Castle Cove. Usually occurs on shallow sandstone soils bordering coastal heath with laterite-influenced soils, often with restricted drainage. Large obvious plant.	**Local Occurrence**: Low likelihood. Targeted during survey. No records within 5km of the site in the last decade. Not found during survey. Very obvious species. **Habitat Value:** No suitable habitat occurs within study site. **Direct and Indirect Impacts**: Unlikely. **Conclusion**: No further assessment required.
Persoonia hirsuta	Usually found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone. Usually present as isolated individuals or very small populations.	**Local Occurrence**: Low likelihood. Targeted during survey. No recent records within 1 km of the site. Not found during survey. **Habitat Value**: No suitable habitat occurs within study site. **Direct and Indirect Impacts**: Unlikely. **Conclusion**: No further assessment required.

Scientific Name	Habitat Preference	Likelihood of Occurrence
Pimelea curviflora var. curviflora	Confined to the coastal area of Sydney between northern Sydney in the south and Maroota in the north-west. Usually found in shale/sandstone transition woodland on sandstone and laterite soils.	**Local Occurrence**: Low likelihood. Targeted during survey. No recent records within 4km of the site in the last decade. Not found during survey. **Habitat Value**: No suitable habitat occurs within study site. **Direct and Indirect Impacts**: Unlikely. **Conclusion**: No further assessment required.
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.	**Local Occurrence**: Medium likelihood. Targeted during survey. No records within 1km of the site in the last decade. Obvious species. Site adequately searched. Not found during survey. **Habitat Value**: Medium suitable habitat occurs on the study site. **Direct and Indirect Impacts**: Unlikely. **Conclusion**: No further assessment required.

5.3 Assessment of Likely Occurrence Threatened Fauna Species

Table 7: Habitat Suitability for Targeted Threatened Fauna Species

Name	Habitat Preference	Likelihood of Occurrence
Amphibians		
Giant Burrowing Frog *Heleioporus australiacus*	Found in heath, woodland and open forest with sandy soils. Generally travels several hundred metres to creeks to breed. Burrows into deep litter or loose soil, emerging to feed or breed after rain. Diet includes ground-dwelling invertebrates such as ants, beetles and spiders	**Historic records**: Fifteen records within 5 km of the site. No records within 1 km of site. **Importance of site**: **Low** quality habitat occurs on this site due to no permanent drainage lines or streams. **No further assessment required.**
Red-crowned Toadlet *Pseudophryne australis*	Occurs in open forests. Inhabits periodically wet drainage lines below sandstone ridges that often have shale lenses or cappings. Shelters under rocks and amongst masses of dense vegetation or thick piles of leaf litter.	**Historic records**: Twenty-eight records within 5 km of the site. No records within 1 km of site. **Importance of site**: **Low** quality habitat occurs on this site due to no permanent drainage lines or streams. **No further assessment required.**
Aves		
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	**Historic records**: Eighteen records within 5km. One record within 1km to the south. **Importance of site: Low** quality habitat occurs on site. **Medium** quality foraging habitat. No suitable roosting or nesting habitat onsite. Possibly part of a large home range**.**

	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.	**No further assessment required.**
Bush Stone-curlew *Burhinus grallarius*	Occurs in open forests and woodlands with a sparse grassy ground layer and fallen timber. Feed on insects and small vertebrates, such as frogs, lizards and snakes. Nest on the ground in a scrape or small bare patch.	**Historic records**: Forty-five records within 5km. One record, to the north-west, within 1km. **Importance of site: Medium** quality habitat occurs on this site. Possibly part of larger home range. **No further assessment required.**
Eastern Osprey Pandion cristatus	Occurs in coastal areas, near the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water. Breeds from July to September. Nests are made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea.	**Historic records**: Three records within 5km. No records within 1km of the site. **Importance of site: Medium** quality habitat occurs on this site. No suitable nesting trees onsite. No forging habitat onsite. **No further assessment required.**
Gang Gang Cockatoo *Callocephalon fimbriatum*	Inhabits eucalypt open forests and woodland with an acacia understorey. In summer, it lives in moist highland forest types and in winter moves to lower elevations with more open forests. Nests and roosts in hollows, 10 cm in diameter and 9 metres above the ground, in trunks, limbs and or dead spouts of living trees. Feeds on seeds from eucalypts and acacias.	**Historic Records**: One record within 5 km of the site. No records within 1 km of site. **Importance of site: Low.** Medium quality winter foraging habitat in eucalypts. Not within nesting range. **No further assessment required.**
Glossy Black-Cockatoo *Calyptorhynchus lathami*	Inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1000 m. Feeds almost exclusively on the seeds of several species of she-oak (*Casuarina* and *Allocasuarina* species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites.	**Historic records**: Forty-five records within 5km. No records within 1km. **Importance of site: Medium**. One casuarina on site. No evidence of species using the site for foraging. No nesting hollows onsite. Known to occur in the locality. **No further assessment required.**
Little Lorikeet *Glossopsitta pusilla*	Distributed from Cape York to South Australia. Nomadic 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 primarily on eucalypts high in treetops and nests in small tree hollows. Riparian habitats are favoured due to their higher soil fertility.	**Historic records**: Six records within 5 km of the site. No records within 1 km of site. **Importance of site**: **Low**. No evidence of species using the site for foraging. Likely to be a small part of large foraging home range. Potential nesting hollow onsite. **No further assessment required.**
Powerful Owl	Nests in large tree hollows. Inhabits large tracts of forest in a range of vegetation types, from woodland	**Historic records**: One-hundred and eighty-eight records within 5 km of site. Many records within 1km.

Ninox strenua	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.	**Importance of site: Low**. No suitable nesting hollows onsite. No evidence of roosting or nesting found during survey. The Site is likely to be part of large foraging home-range. **No further assessment required.**
White-bellied Sea-Eagle *Haliaeetus leucogaster*	Occurs at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Breeds in mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'.	**Historic records**: Thirty-seven records within 5 km of site. No records within 1km of the site. **Importance of site: Low.** The Site may be part of large foraging home-range. **No further assessment required**.
Mammalia		
Eastern Bentwing-bat *Miniopterus schreibersii oceanensis*	Maternity roosts are usually in large caves or derelict mines, storm-water tunnels, buildings and other man-made structures. Disperses over 300 km range from roost.	**Historic Records**: Twenty-two records within 5 km of site. **Importance of site: Low**. No evidence of roosting in garage or boat shed. Site likely to be a small part of a large foraging home range. **No further assessment required**
Eastern Pygmy-possum ***Cercartetus nanus***	Found in a broad range of habitats from rainforest through sclerophyll forest and woodland to heath, but in most areas woodlands and heath appear to be preferred. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes. Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, possum dreys or thickets of vegetation.	**Historic Records**: Forty-six records within 5 km of the site. No records within 1 km of site. **Importance of site: Low**. Low quality foraging habitat. No food trees onsite. Not recorded during field survey. **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**: Forty-four records within 5 km of site. Two records within 1km east of the site recorded in 1998. **Importance of site**: **Medium.** No roosts occur on site. Likely to forage and fly over. **No further assessment required.**
Koala *Phascolarctos cinereus*	Feeds on the foliage of more than 70 Eucalypt species and 30 other species. No scats or individuals found during survey.	**Historic Records:** Seventy-five records within 5km the Site. Records within 1km of the site are more than 20 years old. **Importance of site: Low**. One food tree on Site. Site could be a small part of a large

		foraging home range. No evidence of koalas using trees. **No further assessment required.**
Southern Brown Bandicoot (eastern) *Isoodon obesulus obesulus*	Usually found in heath or open forest with a dense understorey on sandy or friable soils. Feeds on a variety of ground-dwelling invertebrates and the fruit-bodies of hypogenous (underground-fruiting) fungi.	**Historic Records**: Thirty-four records with 5 km. No records within 1km of the site. **Importance of site: Low.** Low quality foraging habitat on site. Bandicoot diggings onsite, most likely to be Long-nosed Bandicoot due to urban environment. **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 records within 5 km. **Importance of site**: **Low**. No suitable roosting or foraging habitat on site. No evidence of roosting in hollow to be removed. **No further assessment required**
Spotted-tailed Quoll *Dasyurus maculatus*	Occurs across a range of habitat types including rainforest, open forest, woodland and coastal heath. Use hollow-bearing trees, fallen logs, small caves and rock outcrops as den sites. Female home ranges up to 750 hectares and males up to 3500 hectares.	**Historic Records**: Three records within 5 km of site. No records within 1km of the Site. **Importance of site: Low**. **Low quality** habitat on this site. No scats or evidence of dens found during survey. Possibly part of large home range for foraging. **No further assessment required.**
Squirrel Glider *Petaurus norfolcensis*	Inhabits Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. 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.	**Historic Records**: Three records within 5 km of site. No records within 1km of the Site. **Importance of site: Low**. **Low quality** habitat on site due to lack native understorey. Potential food trees and nesting trees but no signs of use. **No further assessment required.**
Reptilia		
Rosenberg's Goanna *Varanus rosenbergi*	Found in heath, open forest and woodland. Associated with termites; mounds are a critical habitat component. Requires large areas of habitat. Feeds on carrion, birds, eggs, reptiles and small mammals. Shelters in hollow logs, rock crevices and in burrows.	**Historic Records:** Ten records with 5km. No records within 1km of the Site. **Importance of site: Low**. No suitable habitat onsite due to urban environment. No termite mounds onsite. **No further assessment required.**

5.4 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) would only be relevant if the proposal was to be or impact a Matter of National Environmental Significance (MNES), thus triggering referral l to the Federal 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 species, Threatened Ecological Communities and Migratory species.

The report lists the following ecologically relevant items:

- 5 Threatened Ecological Communities
- 78 Threatened species
- 57 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.

The EPBC Act Threatened species that have potential habitat onsite have been assessed under BC 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. The vegetation on the site meets the does not meet the definition of any EEC under the EPBC Act.

It is recommended that this proposal (see Map 6) does not need to be referred to Environment Australia.

5.5 Pittwater LEP and DCP 2014 2014 Assessment

5.5.1 Pittwater LEP Part 7.6 Biodiversity

(3) Before determining a development application for development on land to which this clause applies, 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, and*

Response: The Site contains a degraded form of Pittwater and Wagstaffe Spotted Gum Forest EEC with a native canopy and weedy/native mid and understorey. The vegetation is weedy but provides habitat to a range of native fauna. The proposal will remove eight trees that belong to the Pittwater and Wagstaffe Spotted Gum Forest community and parts of the weedy understorey. The site is long and narrow and due to this and the high density of trees the Tree Protection Zone covers nearly the entire property. Alteration to the plans have been made to retain tree 21. Tree Protection Measures will be applied to retain trees 26 and 27, although they are currently with two metres of the indicative building footprint. Replacement tree planting is proposed for the loss of EEC trees at a ratio of 3:1.

It is recommended that the remaining vegetation on the site have weed control and be managed as native bushland including planting species from the PWSGF EEC. This will improve the condition and values of the land for native flora and fauna in the undeveloped parts of the site. If the recommendations are followed then the proposal is likely to improve the condition of the remaining habitat at the site.

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

Response: The site contains remnant patch of degraded Pittwater and Wagstaffe Spotted Gum Forest with a predominantly native tree canopy, sparse midstorey and mown lawn and weedy understorey. The vegetation is very weedy but provides habitat to a range of native fauna. The Aboricultural Impact Assessment by Nigel Dean (Standfast Tree, 13/12/2018) lists eight native (and PWSGF EEC) trees that will require removal as a result of occurring in the building and driveway footprint or structural instability.

Parts of the exotic understorey will be removed, this has low important for the survival of native fauna in the locality.

The removal of Pittwater and Wagstaffe Spotted Gum Forest trees will be offset by planting, with the same species or other tree species of the same community, at a ratio of three trees for every one that is removed. There will also be removal of exotics and weeds and planting of PWSGF EEC understorey species under the canopy of EEC trees to be retained in the Revegetation Area. This will improve the importance of the vegetation in the undeveloped parts of the site.

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

Response: The removal of 8 remnant canopy trees that are from the community PWSGF will diminish the structure and composition of the remnant vegetation at the site, however will not affect the function of the land as habitat for native flora and fauna species as the majority of the remanet canopy trees on the site will be retained. There will be replacement tree canopy planting at a ratio of 3:1, however it will take some time for the trees to grow large enough to function the same as the trees that were removed.

The removal of parts of the weedy understorey for the building and drive footprints will unlikely disturb or diminish the biodiversity structure, function or composition of the land. There will be planting of local native species in in the Revegetation Area of the site, see Appendix B, that will improve the ecological value of the undeveloped parts of the site.

It is recommended that the hollow to be removed is replaced with 2 suitably sized nesting boxes**.**

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

Response: Retaining trees 26 and 27 will proved continuing canopy from the front west to the east of the property. The corridor along the foreshore and the connectivity provided by remnant tree canopies will be maintained. Movement of highly mobile fauna such as birds and bats is not likely to be effected by the proposal.

> *(b) any **appropriate measures proposed to avoid, minimise or mitigate** the impacts of the 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*

Response: The majority of the native remnant trees and hollow bearing trees will be retained. There will be no works along the foreshore part of the property. A preliminary report that outlined ecological constraints was sent to the architect.

> *(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*

Response: See recommendation section in *Ameliorative Conditions and Recommendations*.

> *(c) if that impact cannot be minimised—the development will be managed to **mitigate** that impact.*

Response: The impact to the native tree canopy will be mitigated by tree replacement **planting at a ratio** of 3:1. There will also be removal of weeds and exotic and planting of PWSGF EEC groundcovers to improve the habitat value in the vegetated parts of the site to be retained

5.5.2 Pittwater DCP Part B4.7 Pittwater Spotted Gum Forest

Outcomes

- *Conservation of intact Pittwater Spotted Gum Forest EEC. (En)*

Response: The Pittwater and Wagstaffe Spotted Gum Forest EEC on the site is in a degraded form with a native canopy consisting of 23 remnant trees, and exotic and weedy understorey with some native. The

proposal will remove eight of the canopy trees and some of the disturbed understorey. The majority of the native EEC trees on the site will be retained.

- *Regeneration and/or restoration of fragmented and / or degraded Pittwater Spotted Gum Forest EEC. (En)*

Response: The proposal includes the planting of replacement canopy EEC trees at a ratio of 3:1. There will also be planting of PWSGF EEC understory species in the Revegetation Area of the site along with weed and exotic removal.

- *Reinstatement of Pittwater Spotted Gum Forest to link remnants. (En)*

Response: The majority of the site already contains a remnant canopy of PWSGF EEC species. Understorey species will be planted under the canopy of the existing PWSGF EEC to be retained. Replacement canopy trees will be planted to offset the loss of those removed.

- *Long-term viability of locally native flora and fauna and their habitats through conservation, enhancement and/or creation of habitats and wildlife corridors. (En)*

Response: The proposal includes the planting of replacement canopy EEC trees at a ratio of 3:1. There will also be planting of PWSGF EEC understory species in the Revegetation Area of the site along with weed and exotic removal.

Controls

- *Development shall not have an adverse impact on Pittwater Spotted Gum Endangered Ecological Community.*

Response: The Pittwater and Wagstaffe Spotted Gum Forest EEC on the site is in a degraded form with a native canopy consisting of 23 remnant trees, and exotic and weedy understorey with some native. The proposal will remove eight of the canopy trees and some of the disturbed understorey. The majority of the native EEC trees on the site will be retained.

- *Development shall restore and/or regenerate Pittwater Spotted Gum Endangered Ecological Community and provide links between remnants.*

Response: The majority of the site already contains a remnant canopy of PWSGF EEC species. Understorey species will be planted under the canopy of the existing PWSGF EEC to be retained. Replacement canopy trees will be planted to offset the loss of those removed.

- *Development shall be in accordance with any Pittwater Spotted Gum Forest Recovery Plan.*

Response: The development is in accordance with the Recovery Plan.

- *Development shall result in no significant onsite loss of canopy cover or a net loss in native canopy trees.*

Response: The proposal will result in the loss of 8 PWSGF canopy tree. The loss of the tree will be offset with tree replacement plantings at ratio 3:1. The trees will be planted onsite in suitable canopy gaps.

- *Development shall retain and enhance habitat and wildlife corridors for locally native species, threatened species and endangered populations.*

Response: The development will retain the corridor along the foreshore of the property. The connection between tree canopies will be retained from the east to the west across the site and to the adjacent properties. The habitat value on the Revegetation Areas of the site will be enhanced by planting local native understorey species, as shown in the landscape plan.

- *Caretakers of domestic animals shall prevent them from entering wildlife habitat.*

Response: Recommendations have been made to reduce the impact of domestic animals on native fauna.

- *Fencing shall allow the safe passage of native wildlife.*

Response: There is no proposed fencing that would prevent wildlife access.

- *Development shall ensure that at least 80% of any new planting incorporates native vegetation (as per species found on the site or listed in Pittwater Spotted Gum Endangered Ecological Community).*

Response: The Landscape Plan (Landart 22/1/19) includes the planting of PWSGF EEC species in the understorey and tree canopy.

- *Development shall ensure any landscaping works are outside areas of existing Pittwater Spotted Gum Endangered Ecological Community and do not include Environmental Weeds*

Response: The majority of the areas under the existing canopy of PWSGF EEC tree will be revegetated with local native species.

5.7 5-Part Test of Significance

After an assessment of the potential habitat at the site, historic records and BAM modelling, two Threatened biota were considered to have potential impact due to this proposal a 5-part Test of Significance (Section 7.3 of the BC Act 2016) was completed for the following biota:

- Pittwater and Wagstaffe Spotted Gum Forest Endangered Ecological Community

The 5-Part Tests (in Appendix A) concluded that this proposal is not likely to have a significant effect on these biota. These conclusions are reliant on the assumptions stated in this report.

5.8 BOS Threshold Assessment

The Biodiversity Conservation Act Regulation (Aug 2017) requires that the Biodiversity Offset Scheme (BOS) threshold test (section 7.1 to 7.3) be applied to all development applications, to determine if the requirement to enter the BOS is triggered. If triggered then the Biodiversity Assessment Method (BAM) needs to be applied and a Biodiversity Development Assessment Report (BDAR) is required.

The Biodiversity Offsets Scheme applies to local developments, major projects or the clearing of native vegetation where the *State* Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 applies.

This proposal as described in this report is **not** considered to meet the BC Act threshold as;

1) The LEP minimum lot size in this location is less than 1ha therefore the maximum cut off for clearing “Native vegetation” is 0.25ha. If there is no LEP minimum lot size then the actual smallest lot size is used. Native Vegetation is defined in the LLS act as any native plant whether tree, shrub of ground cover plant. The total amount of disturbance to native vegetation by this proposal **is less than 0.25ha**, which is below the threshold limit, therefore, this part of the test is **not triggered**, **and**
2) The, Biodiversity Values Map (BV Map) identifies land with high biodiversity value, as defined by the *Biodiversity Conservation Regulation 2017*. The area of impact for this proposal is **not** mapped on the “Biodiversity Values” Map as having high biodiversity value, **and**
3) This proposal is **not** likely to have a significant affect (5-part test of significance Section 7.3, BC Act) on any Threatened species or ecological community or their habitats. See the section above and Appendix A of this report for the 5-part tests.

Therefore, the proposal **does not require a BAM assessment or BDAR report** but does require a Flora and Fauna report to address; Council legislation (LEP, DCP), the Heads of Consideration in section 4.15 (1) a, b, c of the EP&A Act, SEPPs, other NSW environmental Acts and the Federal EPBC Act 1999. 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.

5.9 Biodiversity Impact Conclusions

The proposal assessed is for a replacement house, reconfiguration of the driveway, swimming pool and hard and soft landscaping.

The site contains a degraded form of Pittwater and Wagstaffe Spotted Gum Forest EEC in the form of 23 remanent characteristic trees, sparse rather good cover plants and a garden and weedy understorey.

The Aboricultural Impact Assessment (Standfast Tree Services,13/12/18) identified 8 native trees that will require removal for the proposal, all of which are PWSGF EEC trees. The trees to be removed include one hollow bearing tree (*Eucalyptus botryoides* T23).

Replacement PWSGF ECC tree canopy planting at a ratio of 3:1 and planting of PWSGF EEC understorey species is proposed. See *Ameliorative Conditions and Recommendations* section of this report for specifications.

Recommendations have been made to further avoid, minimise and mitigate impacts to important habitat features and ecological values are provided in *Ameliorative Conditions and Recommendations* section of this report.

The BC Act and EP&A Act requires that proactive planning needs to be undertaken to avoid and minimise environmental impacts. Discussions were held with the Architect and Landscape Architect, a constraints map was produced, the plans were mapped and planting lists and guiding for Pittwater Wagstaffe Spotted Gum Forest revegetation were provided.

The proposal (see Map 6) with the ameliorative conditions described in this report is not likely to have a significant effect to any threatened species, population or ecological community or their habitat 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.

The ecological impact of the proposal is not likely to be an unacceptable impact by itself under Section 79C (now 4.15) of the EPA Act or to have a significant impact under part 5A. The ecological impact can be reduced by the recommended ameliorative conditions.

The proposal is not considered to be a 'matter of National Environmental Significance (NES)' EPBC Act referral of the proposal to the Federal Department of the Environment and Water Resources is not considered necessary.

The proposal meets the requirements and objectives of part 7.6 of the Pittwater LEP 2014.

We recommend that ameliorative conditions and management recommendations in this report be followed to reduce disturbance during construction and to improve ecological outcomes in the long term.

6 Ameliorative Conditions & Recommendations

6.1 Recommendations to Avoid and Minimise Impact During Planning

- Native vegetation on the site is to be retained where possible. This is a requirement of 3.3.2 of Appendix 9 of the Pittwater DCP 2014. This will maintain habitat values and reduce the risk of soil erosion.
- Natural rock features should be retained where possible to maintain habitat and reduce the risk of soil erosion. Retaining significant natural features is a requirement of 3.3.2 of Appendix 9 of the Pittwater DCP 2014.
- Replacement tree planting is proposed for the loss of EEC trees at a minimum ratio of 3:1.
- It is recommended that any landscaping on the property include suitable locally native species from the Pittwater Wagstaffe Spotted Gum Forest ecological community, see Appendix B. Protecting and enhancing bushland is a requirement in 3.3.2 of Appendix 9 of the DCP 2014.
- It is recommended that the hollow to be removed is replaced with 2 suitably sized nesting boxes.

6.2 Prior to issue of the Construction Certificate

- Sediment control devices such as sediment fences, are to be in place prior to the commencement of works and should be in place and maintained for the duration of the works.
- Weed control and planting suitable local native species on the site are recommended to prevent erosion occurring and to improve the habitat quality on site. This is to prevent the spread of weeds during construction, reduce erosion and provide habitat in the long-term.
- Environment Protection Fencing should be erected to prevent accidental harm to parts of the site to be retained as habitat.

6.3 During Construction

- There is to be sediment fencing downslope from all earthworks and around all stockpiles, to prevent sediment entering the foreshore.
- There is to be no earthworks during wet weather.
- Ongoing 3 monthly weed control is be carried out across the property to maintain and improve habitat and wildlife corridor value, reduce the occurrence of medical conditions (asthma, hay fever, rashes and allergies), caused by weeds, reduce fuel loads and to improve aesthetics. The sight of weeds also decreases the perception of an areas value. Landowners are required by the Biosecurity Act to control weeds on their land.
- No soil is to be left bare following demolition and establishment of an indicative building footprint. Areas that have been disturbed and left bare following construction should be mulched with a weed free mulch and planted with local native species to prevent a future weed problem.

Planting Specifications for Revegetation Area

- The planting density in the Revegetation Area will need to achieve a planting density of 5 plants p/sqm.
- All species are to be from the community Pittwater and Wagstaffe Spotted Gum Forest Endangered Ecological Community. See Appendix B.
- All plants are to be tubestock of local provenance, propagated from seed or cutting within 10km of the site.
- At least 50% of the species listed must be used and no one species can constitute more than 10% of total plant numbers used.

- All existing native species that occur in the Revegetation Area are to be retained where possible.
- There is to be no substitution of species without written approval from the site ecologist or Council.
- Plants are to be watered regularly after planting for one month.
- Minimum of 90% of plantings are to be alive and in a vigorous state at the end of construction prior to issue of occupation certificate.
- Plants can be bought from a local bush regeneration nursery at a cost of approximately $1.50 each.
- Prior to planting the Revegetation Area is to be mulched with 75mm of weed free mulch. All imported mulch must be of known provenance and free of weeds including Coral Trees.
- No fertiliser, pesticides or insecticide is to be used in the Revegetation Area.

7 References

Australian Standard 4970 – 2009 Protection of Trees on Development Sites

Cropper, S.C. (1993) Management of Endangered Plants CSIRO Publications, East Melbourne.

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Morrison D. A. and Davies S. J. 1991. Acacia, in G. J. Harden (Ed.) Flora of New South Wales, Volume 2: 327-392. New South Wales University Press, Kensington.

The Native Vegetation of the Sydney Metropolitan Area Version 3 2016, Volume 2, Office of Environment and Heritage (OEH)

Northern Beaches Council Website, Pittwater LEP and DCP 2014

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NSW Rural Fire Service, 2006, Planning for Bushfire Protection, A Guide for Councils, Planners, Fire Authorities and Developers

Weeds Australia (2009) An Australian Government Initiative, Weeds of National Significance, Web Site viewed 20/06/2012, http://www.weeds.org.au/natsig.htm

8 Appendix A: 5-part Tests of Significance

8.1 Definitions (DEEC 2006)

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 BC 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*

8.2 5-Part Test of Significance for the Pittwater and Wagstaffe Spotted Gum Forest EEC

3) **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: Pittwater and Wagstaffe Spotted Gum Forest is not listed as a Threated species, therefore this question is not applicable.

- Habitat loss and degradation due to urban development including encroachment.
- Encroachment from urban areas including illegal and legal tree and understorey removal, planting of exotic species and weed invasion.
- Inappropriate fire regime being a combination of lack of fire and too frequent fires due to arson and hazard reduction burns.
- Stormwater and soil erosion.
- Disturbance from recreational users, including unauthorised visitor access; rubbish dumping, illegal trails, illegal mountain bike tracks, and walkers.
- Introducing and spreading of disease including phytophthora and myrtle rust.
- Weed invasion, including multiple asparagus species, mickey mouse weed, bitou, privet, crofton weed, lantana, mixed woody weeds and garden escapes.
- Lack of knowledge about extent, composition and condition beyond the areas mapped for this toolbox.

(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

Response: The site contains 600m^2 of a degraded form of Pittwater and Wagstaffe Spotted Gum Forest consisting of 23 remnant canopy trees with a mostly exotic and weedy understorey. The proposal will remove 8 canopy trees and an area of exotic and weedy understorey. This will result in a 170m^2 reduction in the extent of the EEC onsite due to the loss of canopy cover (see Map 6), however the majority of the canopy trees on the site will be retained. Native tree canopy replacement planting is proposed at a ratio of 3:1 (3 canopy trees planted for each one that is lost).

(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: The site contains a degraded form of Pittwater and Wagstaffe Spotted Gum Forest consisting of 23 remnant canopy trees with a mostly exotic and weedy understorey. The proposal will remove 8 canopy trees and an area of exotic and weedy understorey. The proposal aims to improve the condition of the remaining PWSGF EEC by weed control and planting under the canopy of PWSGF trees in the western and eastern parts of the site (see Map 6) including planting PWSGF canopy trees.

(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 8 PWSGF EEC trees and an area of exotic weedy understorey.

(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: The proposal will unlikely further fragment or isolate areas of habitat as the majority of the canopy that connects the site to other remnant patches in the locality, will be retained.

(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 understorey to be removed is highly degraded and contains mostly exotic garden species. The proposed planting in the western and eastern parts of the site would improve the condition of the vegetation in the undeveloped parts of the site (see Map 6 and planting list in Appendix B). The 8 canopy trees to be removed are a small percentage of the remanent canopy that exists in the locality and are therefore not considered important for the long-term survival of this community. The canopy tree to be removed will be replaced with PWSGF EEC saplings at a ratio of 3:1 (tree planted: loss)

(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 an area of approximately 250m^2 of weedy native vegetation. This will unlikely significantly increase the impact of this Key Threatening Process.

Loss of Hollow Bearing Trees

The proposal will remove 1 hollow bearing tree. The removal of this tree has been avoided but is recommended by the arborist due to it being hazardous.

Conclusion to the 5-Part Test of Significance on the impact of the proposal on the Pittwater and Wagstaffe Spotted Gum Forest Endangered Ecological Community

The proposal is not likely to have a significant impact on the local occurrence of Pittwater and Wagstaffe Spotted Gum Forest and a Biodiversity Development Assessment Report (BDAR) is not recommended for this proposal.

9 Appendix B: Suitable Pittwater Spotted Gum Planting Schedule

by Nicholas Skelton, GIS Environmental Consultants, Ph 041 943 8672

Scientific Name	Family	Habit	Common Name
Macrozamia communis	ZAMIACEAE	Cycad	Burrawang
Adiantum aethiopicum	ADIANTACEAE	Fern	Maidenhair Fern
Blechnum ambiguum	BLECHNACEAE	Fern	
Cyathea cooperi	CYATHEACEAE	Fern	Straw Tree Fern
Doodia caudata var. caudata	BLECHNACEAE	Fern	
Todea barbara	OSMUNDACEAE	Fern	
Oplismenus aemulus	POACEAE	Grass	Basket Grass
Themeda australis	POACEAE	Grass	Kangaroo Grass
Xanthorrhoea macronema	XANTHORRHOEACEAE	Grass Tree	Grass Tree
Dianella caerulea var. caerulea/producta	PHORMIACEAE	Herb	Blue Flax Lily
Dichondra repens	CONVOLVULACEAE	Herb	Kidney Weed
Geranium homeanum	GERANIACEAE	Herb	
Gymnostachys anceps	ARACEAE	Herb	Settlers Flax
Lomandra filiformis	LOMANDRACEAE	Herb	Mat-rush
Lomandra longifolia	LOMANDRACEAE	Herb	Spiny-headed Mat-rush
Viola hederacea	VIOLACEAE	Herb	Native Violet
Livistona australis	ARECACEAE	Palm	Cabbage Tree Palm
Breynia oblongifolia	EUPHORBIACEAE	Shrub	Breynia
Dodonaea triquetra	SAPINDACEAE	Shrub	Hop Bush
Notelaea longifolia forma longifolia	OLEACEAE	Shrub	Mock Olive
Notelaea venosa	OLEACEAE	Shrub	Veined Mock-olive
Oxylobium ilicifolium	FABACEAE - FABOIDEAE	Shrub	Native Holly
Persoonia linearis	PROTEACEAE	Shrub	Narrow-leaved Geebung
Pultenaea flexilis	FABACEAE	Shrub	Graceful Bush Pea
Acmena smithii	MYRTACEAE	Tree	Lily Pilly
Banksia integrifolia ssp. integrifolia	PROTEACEAE	Tree	Coastal Banksia
Cassine australis var. australis	CELASTRACEAE	Tree	
Diospyros australis	EBENACEAE	Tree	
Elaeocarpus reticulatus	ELAEOCARPACEAE	Tree	Blueberry Ash

Glochidion ferdinandi var. ferdinandi	EUPHORBIACEAE	Tree	Cheese Tree
Syzygium oleosum	MYRTACEAE	Tree	Blue Lillypilly (Edible Fruit)
Syzygium paniculatum	MYRTACEAE	Tree	Magenta Lillypilly (Edible Fruit)
Billardiera scandens	PITTOSPORACEAE	Vine	Apple Berry, Dumplings
Cissus antarctica	VITACEAE	Vine	Kangaroo Vine
Cissus hypoglauca	VITACEAE	Vine	Native Grape
Eustrephus latifolius	LUZURIAGACEAE	Vine	Wombat Berry
Geitonoplesium cymosum	LUZURIAGACEAE	Vine	Scrambling Lily
Glycine clandestina/microphylla	FABACEAE	Vine	Love Creeper
Kennedia rubicunda	FABACEAE	Vine	Dusky Coral-pea