Flora & Fauna Assessment

(and BAM Threshold test)

for the

Demolition of Existing 2 buildings and Construction of a Boarding House

at

60 Binalong Avenue, Allambie Heights

By

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and

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30th January 2018

Prepared for

Gannet Developments

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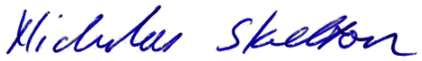

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should not be relied upon. The report and its attachments should be read as a whole and no individual part of the report or its attachments should be interpreted without reference to the entire report.

1 Introduction

1.1 Background

This report describes the ecological values and constraints at Lot 2211 and 2223, DP752038 known as 60 Binalong Avenue, Allambie Heights 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 likely impacts of the proposed development on terrestrial biodiversity are assessed as required by Federal, State and Local Government legislation.

Impacts to Threatened and other native plants and animals, that are likely occur during construction and occupation are identified and ways these impacts can be avoided and minimised have been discussed with the developer and the plans have been modified. Recommendations to further ameliorate ecological impacts are included in this report.

An accurate description of the flora and fauna and an assessment of the ecological impact is required when submitting development applications to allow assessment of the application in relation to the following legislation; *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 may be needed to assess the development with respect to other acts, policies, regulations, SEPPs, local government controls, orders and policies such as; LEPs, DCPs, *Biosecurity Act 2015*, *Rural Fires Act 1997*.

1.1 Aims of this Report

The aims of this flora and fauna assessment are to:

- Record the findings of an ecological (flora, fauna and ecological communities and their habitats) survey of the area likely to be impacted by the proposal;
- Determine the ecological constraints of the site and provide advice on ways the impact can be avoided and minimised before finalising the proposal plans;
- Assess the likely impact of the final proposal on the ecology of the site including native animals and plants, in particular Threatened species, populations and ecological communities, and their habitats;
- Prepare a flora and fauna impact assessment in accordance with the requirements of the *Environment Planning and Assessment Act* (EPA Act) (particularly Section 79C), the *Biodiversity Conservation Act 2016 and regulations*);
- Assess whether the proposal will have a significant impact to Threatened Species or Endangered ecological communities;
- Assess if the proposal meets the threshold test for the Biodiversity Assessment Method (BAM), and determine any required offset;
- Address the requirements for an ecological assessment needed by the local council's LEP and DCP;
- Recommend ways the ecological impact of the proposal can be further ameliorated by offsetting and/or property management.

1.2 Legislation Addressed by the Report

1.2.1 Biodiversity Conservation Act 2016

On the 25th of August 2017, the Biodiversity Conservation Act 2016 (BC Act) replaced the Threatened Species Conservation Act 1995 (TSC Act 1995), the Native Vegetation Act 2003 and modified parts of the EP&A and NPWS Acts.

This act lists the Threatened flora and fauna species and defines the ecological communities in NSW and the regulation for the Act requires that a threshold test be applied to Development Applications. If the threshold is met, the Biodiversity Assessment Method (BAM) needs to be applied to determine the type of survey and assessment and the amount of offsetting required.

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

1.2.2 Environment Planning and Assessment Act 1979

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

Section 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.

1.2.3 Northern Beaches Council (Warringah) LEP (2011) and DCP (2011)

The Northern Beaches Local Council (Warringah) Local Environment Plan (WLEP 2011) aims to protect the environment and the quality of life in the Northern Beaches while promoting sustainable development. The Warringah Development Control Plan (WDCP 2011) contains detailed planning controls. Both the WLEP and the WDCP must be considered when a determining authority assesses development in this area.

The study area is zoned as R2 Low Density Residential.

The parts of WDCP 2011 relevant to the proposed development are as follows:

E2 Prescribed Vegetation

This control applies to all areas where the WLEP 2011 applies and is therefore relevant to the property. This Flora and Fauna report addresses the requirements of section E2 of the Warringah DCP.

E4 Wildlife Corridors

The property is mapped as part of a Wildlife Corridor on the "Wildlife Corridors' map. This Flora and Fauna report addresses the requirements of section E4 of the Warringah DCP.

E6 Retaining Unique Environmental Features

This control applies to all areas where the WLEP 2011 applies and is therefore relevant to the property. This Flora and Fauna report addresses the requirements of section E6 of the Warringah DCP.

E7 Development on Land Adjoining Public Open Space

The property is mapped as adjoining public open space on the "Land Adjoining Public Open Space" Map. This Flora and Fauna report addresses the requirements of section E7 of the Warringah DCP.

E8 Waterways and Riparian Lands

The property is mapped as containing Riparian Land on the "Waterways and Riparian Lands" Map. Section E8 of the Warringah DCP is addressed separately in a Waterway Impact Statement (Skelton and Drane, February 2018).

1.2.5 Federal Environment Protection and Biodiversity Conservation Act, EPBC Act

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

Assessment of a Development Application with respect to the EPBC Act 1999 is not a Council issue but is the responsibility of the proponent. Proponents should be advised by their ecological consultant whether a referral is necessary. Assessment under the Commonwealth Environment Protection and Biodiversity

Conservation Act 1999 (EPBC Act) is needed if the proposal is considered likely to have an impact on a 'matter of National Environmental Significance (NES)' then the proposal would need detailed assessment and referral to the Federal Department of Environment and Energy (DEE) thus providing a trigger for referral of the proposal to the Environment Department for assessment. Matters of national environmental significance identified in the Act are: world heritage properties; national heritage places; RAMSAR wetlands; nationally threatened species and communities; migratory species protected under international agreements; the Commonwealth marine environment; nuclear actions and a water resource, in relation to coal seam gas development and large coal mining development.

This report addresses the requirements of this legislation.

1.3 Definitions and Acronyms

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. Replaces the 7 and 8 part tests of previous legislation.

APZ – Bushfire hazard fuel reduction Asset Protection Zone, defined in the document '*Planning for Bushfire Protection 2006*'. Usually consisting of an Inner Protection Area (IPA) and an Outer Protection Area (IPA)

Assessment of Significance – Five-part test for determining whether proposed development or activity is likely to significantly affect, threatened species, ecological communities or their habitats as described in section 7.3 Biodiversity Conservation Act.

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

BC Act - NSW Biodiversity Conservation Act 2016 replaced the Threatened Species Conservation Act, the native Vegetation Conservation Act and modified the EP&A and the NPWS Acts. The Act contains the lists of threatened species, the definitions of the threatened ecological communities, 5 part tests, Assessment of Significance and the BOS. There is an associated Biodiversity Conservation regulations which refers to the BAM.

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

DCP - Development Control Plan, a local planning instrument, defined in the EPA Act.

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 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, when applying each factor, to all of the likely indirect impacts of the proposed activity or development. As defined by the 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

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, defined in the EPA Act

OEH – NSW Office of Environment and Heritage, formerly NPWS, DEC, DECC and DECCW

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".

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

1.4 Assumptions and Limitations

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

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. Further details can be found at www.ecology.net.au.

Sophia Mueller Sewell has a Bachelor of Science (B. Sc) majoring in Environmental Biology. Sophia was responsible for assisting with field surveys and report writing and editing.

Legend

60 Binalong Ave

Map 1. Study Site, Aerial Photo and Plots

60 Binalong Ave, Allambie Heights

Date: 25/01/2018

N

0 1.75 3.5 7 m

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1.6 General Description of the Proposal

The proposal is shown on Map 5 and includes;

- Demolition of the 2 existing buildings
- The removal of 23 trees on the site, one of which is a prescribed native tree (Cheese Tree), others are native tree species that do not meet the definition of a prescribed tree (eg. *Pittostrum undulatum*, *Ficus rubininosa*).
- Construction of a new 2 storey 36 room boarding house with outdoor common
- Construction of an 9-car underground garage.
- One native tree on the site will be retained (Tree 11, a Cheese Tree), this tree is also a prescribed tree. Adjacent to the property there are several non-native and native tree that will be retained.
- Establishment and maintenance of a bushfire asset protection zone
- Establishment and maintenance of a riparian zone
- Landscaping of gardens

1.7 Plans and Documents Used for this Report

Title	Author	Rev	DWG./Doc. No./Ref.	Date
Plan showing boundaries, relative heights & physical feature	Bee and Lethbridge		20818	22/01/2017
Demolition Plan	Walsh Architects	A	DA020	07/01/18
Basement Plan	Walsh Architects	A	DA101	07/01/18
Ground Plan	Walsh Architects	A	DA102	07/01/18
Roof Plan	Walsh Architects	A	DA104	07/01/18
Area Calculations	Walsh Architects	A	DA400	07/01/18
Landscape DA Plan	Banksia Design Group	C	2/3	24.01.18
Bushfire Risk Assessment	Matt Toghill	-	60BIN-02	25/01/18
Arboricultural Impact Assessment	Urban Forestry Australia	-	-	Jan 2018
Water Impact Statement	Skelton and Drane	A	-	30/01/18
Biodiversity Management Plan	Skelton and Sewell	A	-	1/2/18

2 Part 1. Existing Environment – Vegetation Habitat and Environmental Context

2.1 Literature and Database Search

Relevant information was obtained from literature, local knowledge and established sources such as scientific journals, electronic databases and reports. Records gathered were also used and data in databases were consulted including BioNet (NPWS Atlas of NSW Wildlife records, Australian Museum

specimen records and the Royal Botanic Gardens), ROTAP records and Birds Australia Atlas. Searches were also undertaken on the DOEE – 'protected matters search tool' website to generate a report that will help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in the area of interest.

This information was used to ascertain which threatened species are known to occur within a 5km radius of the study area. The data were then combined with local knowledge and the habitat conditions within the study area to compile a list of plant and animal species for specific targeting during the fieldwork. These lists are Table 1 and 2.

2.2 Locality and Adjacent Land

The site and adjacent allotments to the south and west are zoned R2, Low Density Residential and contain single residential dwellings. To the north across the road is a public park. Immediately adjacent eastern boundary is the northernmost part of a Council owned drainage reserve (Zoned RE1 Public Recreation) that extends approximately 400 south of the site. Less than 200m south-east of the site is a large area of bushland called Manly Warringah War Memorial Park that is connected to Garigal National Park. The proximity of the site to the National Park, development and nearby bushland is shown on Maps 1 and 2.

2.2.1 Vegetation Mapping in the Locality

Map 4 shows the vegetation types (ecological communities) that have been mapped at regional scale (Native Vegetation of the Sydney Metropolitan Area V3 2016). The property and the adjacent drainage reserve is mapped as Coastal Sandstone Gully Forest (S_DSF09, PCT 1250). Other mapped vegetation communities near the include Sydney North Exposed Sandstone Woodland (S_DFS11, PCT 1783) and Coastal Sandstone Heath-Mallee (S_HL08, PCT 1824)

2.3 Landscape Features

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

The location of the site and its context and the environmental features in the locality are shown on Maps 1, 2, 3,and 4.

2.3.1 Topography

The site has a gentle slope towards the south-east corner. Between the western boundary and Binalong Avenue is a steep slope. As a result, the road level at the section is approximately 1m higher than the ground level of the property.

10m contours of the site and the locality are shown on Map 3.

2.3.2 Drainage

Overland flow will flow south-east into the adjacent open drain creek line running down the eastern side of the site which flows into Manly Creek then Manly lagoon.

2.3.3 Geology and Soils

The property is on Narrabeen Group sandstone on the Hawkesbury soil type. There is no exposed bedrock. The soils in the locality are shown on Map 4.

Legend

- Buffer 1500m
- 60 Binalong Ave
- Drainage

Map 2.
Locality Aerial Photograph

60 Binalong Ave, Allambie Heights

Date: 25/01/2018

N

0 125 250 500 m

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Legend

- Buffer 1500m
- 60 Binalong Ave
- Contour 10m

Map 3.
Locality Topography and Features

60 Binalong Ave, Allambie Heights

Date: 25/01/2018

N

0 125 250 500 m

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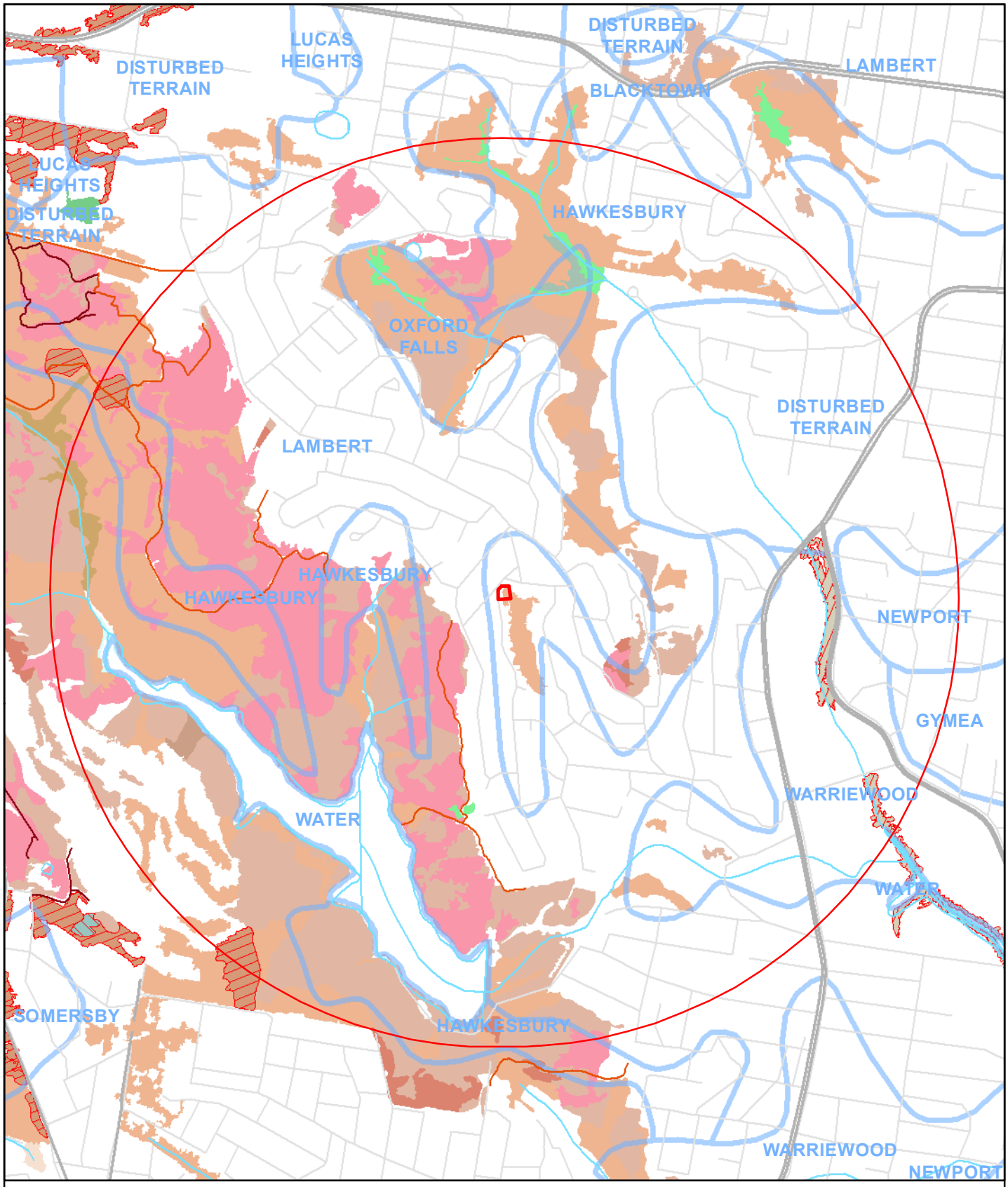

Legend

- Buffer 1500m
- 60 Binalong Ave
- Drainage
- Soils Sydney ed 4 DPI

Vegetation of Sydney v3 2016 EEC

Endangered Ecological Community

- Coastal Upland Swamp
- Duffys Forest Ecological Community
- Swamp Oak Floodplain Forest

Vegetation of Sydney v3 2016

Vegetation Type

- Art_WL: Artificial Wetland
- S_DSF04: Coastal Enriched Sandstone Dry Forest
- S_DSF06: Coastal Sandstone Foreshores Forest
- S_DSF08: Coastal Sandstone Riparian Forest
- S_DSF09: Coastal Sandstone Gully Forest
- S_DSF11: Sydney North Exposed Sandstone Woodland
- S_DSF14: Sydney Ironstone Bloodwood-Silvertop Ash Forest
- S_FoW08: Estuarine Swamp Oak Forest
- S_FrW01: Coastal Upland Damp Heath Swamp
- S_HL08: Coastal Sandstone Heath-Mallee
- S_HL09: Coastal Sandstone Rock Plate Heath
- S_RF02: Coastal Sandstone Gallery Rainforest
- S_WSF02: Coastal Enriched Sandstone Moist Forest
- S_WSF06: Coastal Shale-Sandstone Forest

Map 4.
Locality Mapped Vegetation Types & Soils

60 Binalong Ave, Allambie Heights

Date: 25/01/2018

N

0 125 250 500 m

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

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2.4 Targeted Threatened Species

Table 1: Targeted Threatened Flora Species

Genus and Species	Common Name	TSC Act status	EPBC Act status	Bionet records within 5 km
Acacia terminalis subsp. terminalis	Sunshine Wattle	E1,P	E	184
Eucalyptus camfieldii	Camfield's Stringybark	V,P	V	30
Grevillea caleyi	Caley's Grevillea	E4A,P	E	185
Persoonia hirsuta	Hairy Geebung	E1,P,3	E	26
Pimelea curviflora var.*curviflora*	Curved Rice-flower	V,P	V	26
Prostanthera marifolia	Seaforth Mintbush	E4A,P,3	CE	168
Syzygium paniculatum	Mangenta Lilly Pilly	E1,P	V	23
Tetratheca glandulosa		V,P		61

Table 2: Targeted Threatened Fauna Species

Class	Common Name	Genus and Species	TSC Act status	EPBC Act status	Bionet records within 5 km
Amphibia	Red-crowned Toadlet	*Pseudophryne australis*	V,P		98
Aves	Glossy Black-Cockatoo	*Calyptorhynchus lathami*	V,P,2		27
Aves	Barking Owl	*Ninox connivens*	V,P,3		4
Aves	Masked Owl	*Tyto novaehollandiae*	V,P,3		1
Aves	Powerful Owl	*Ninox strenua*	V,P,3		234
Aves	Sooty Owl	*Tyto tenebricosa*	V,P,3		3
Mammalia	Eastern Bentwing-bat	*Miniopterus schreibersii oceanensis*	V,P		63
Mammalia	Grey-headed Flying-fox	*Pteropus poliocephalus*	V,P	V	106
Mammalia	Little Bentwing-bat	*Miniopterus australis*	V,P		7
Mammalia	Southern Myotis	*Myotis macropus*	V,P		10
Mammalia	Eastern Pygmy-possum	*Cercartetus nanus*	V,P		67
Reptilia	Rosenberg's Goanna	*Varanus rosenbergi*	V,P		98

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).

2.5 Field Survey

The field survey was carried out on the 14th December 2017 and the 28th January 2017 by three experienced ecologists over 5 person-hours. The weather was sunny and temperature was approximately 20-25ºC. During the field surveys, all sections of the study area and some of the surrounding land were traversed on foot. The landscape features were surveyed using the Biodiversity Assessment Method (BAM). The study area was searched for the presence of threatened flora and fauna species and their habitat. 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;
- Identification and recording of all flora species in the 400m^2 plot and also in the rest of the property;
- Identification of fauna through sightings, calls and potential habitat
- Search for scats, remains, nests, dreys, bones, feathers, fur, diggings, scratches, tracks, owl white-wash and food sources. Examination of trees for scratchings, sap-feeding notches and hollows

- Classification of any vegetation into communities according to their structural and floristic attributes
- Assessment of the habitats within the Study Area
- Detailed search for targeted threatened species
- Assessment of the extent of disturbance and weed invasion
- Photography of the study area

2.5.1 Vegetation Survey

Vegetation Assessment

One Biodiversity Assessment Method (BAM) survey plot was recorded, to quantify vegetation integrity as follows: one 400 m^2 plot (20 m x 20 m) was used to assess the composition and structure; one 1000 m^2 (20 m x 50 m) plot was used to assess functional attributes of the site; and five 1 m^2 subplots nested within the 1000m^2 plot were used to assess the average percentage leaf litter cover.

Composition and Structure

The floristic composition was surveyed in one 20m x 20m plot. Information for each plant species found within the plots were recorded including: scientific and common name; and the percent foliage projected cover across the plot of each species rooted in or overhanging the plot.

This information was then used to determine the Plant Community Types (PCT) present (or most likely PCTs) and the presence of any endangered ecological communities (EECs) listed in schedule 2 of the BC Act 2016.

Function

The number of large trees, the presence of tree stem size classes, tree regeneration and fallen log length were measured in the 20m x 50m plot. The DBH of all live trees were measured and assigned a tree stem size class from <5, 5-9, 10-19, 20-29, 30-49, 50-79, and 80+cm. Where a tree had multiple stems, the largest stem was measured.

The number of large trees was recorded within the 20m x 50m plot. The definition of a “large tree” varies depending on the PCT that occurs within the plot.

The length of all fallen logs greater than 10 cm in diameter was measured. Only logs that were dead and on the ground either in part or entirely were measured, and only the length of the log that was inside the plot was measured if the log extended out of the plot.

The percentage litter cover was measured within five 1m x 1m plots distributed evenly along the central 50 m transect (see Map 1). The percentage litter cover includes leaves, seeds, twigs, branchlets and branches (<10 cm diameter).

Table 3: Flora Field Survey Effort

Date	Person Hours	Weather	Type	Location
25th January 2018	2 hours	Fine 25-28°C	Random Meander (Cropper (1993) across each vegetation type	Across the whole of the Study Site
25th January 2018	3 hours	Fine 25-28°C	One 20m x 20m plot, one 20m x 50m plot, and five 1m^2 plots along a 50m transects	See Map 1 for plot location

2.5.2 Fauna Survey

Fauna species were actively searched for by examining rock crevices, searching for tree hollows and looking for animals and/or for signs of use by animals. Elliott, cages or 'harp' traps were not used to reduce any stress to animals. Hollows were investigated internally using an endoscopic camera attached to a pole where necessary. Field notes are available for scrutiny.

Table 4: Fauna Field Survey Effort

Date	Person Hours	Weather	Type	Location
14th December 2017	2 hours	Fine 19-20°C	Targeted habitat searches and bird survey	Across the whole of the Site
25th January 2018	3 hours	Fine 25-28°C	Targeted habitat searches	Across the whole of the Site

2.5.3 Field Assessment of the Vegetation Types

The vegetation within the study area was classified using structural and floristic indicators and was compared with threatened ecological communities listed in the BC Act 2016 and with the document titled The Native Vegetation of the Sydney Metropolitan Area V3 Volume 2 (OEH 2016) and the Bionet PCT vegetation type database. A detailed description of how the presence of Threatened Ecological Communities (EEC) within the study area was determined is given in Section 3.8 below.

2.6 Description of the Study Site

For this proposal the Subject Site, Study Area and Property are the same and is the 2 adjacent lots 2211 and 2223 in DP 752038 with a total area of 1780m^2 that is known as 60 Binalong Ave, Allambie Heights and is within the Northern Beaches LGA. The land is irregular in shape and has 3 street frontages Binalong Ave, Jennifer Ave and Nargong Rd on the western, north-western and northern sides respectively. Adjacent to the eastern side is a Council bushland reserve called Kentwell Road Reserve, which has a drainage line starting at a Council street culvert on Nargong. On the other side of Nargong Road is a mown grass Council park. There is an urban lot with a dwelling to the south and other developed urban lots in the surrounding locality. The Site and the locality are shown on Maps 1, 2, 3 and 4.

The Site has had a long history of disturbance including clearing for the house and garden and many decades of occupation. Similar disturbance has occurred on the other private land in the locality. The adjacent reserve is mostly cleared mown grass land and a strip of weedy thicket immediately adjacent to the site that contains many weeds including, Camphor Laurel, Lantana and Privet. The creek line comes from a Council culvert from the street drainage pipe on Nargong Road. The water in the drainage line flows most of the time.

The eastern part of the site has been identified by Council (WDCP) as contain Riparian Land. The area of Riparian Land on the site is 258m^2. The impact to the Riparian Land is discussed in the accompanying Waterway Impact Statement.

The study site currently contains two existing dilapidated buildings, a one-storey residential dwelling raised above an enclosed garage space and a two - storey stone and cladding workshop/observatory. The buildings have not been occupied for many years and the garden has not been well maintained for decades except for mowing the small lawn. There is also an old concrete driveway and footpath entering from the northern boundary and leading up to the buildings. There are some stonewalls and machinery in the garden. The features of the site and the slope of the land are shown on Map 3.

Photo 1: Creek adjacent to the eastern side of 60 Binalong Ave

Photo 2: From eastern boundary, looking west across Plot 1

Photo 3: Looking east from eastern boundary of property and eastern edge of Plot 1

2.6.1 Geographic co-ordinates

The latitude and longitude of the study area are -33. 770070° S and 151.256507°E.

2.6.2 Native Vegetation Structure

The vegetation on the site unlikely fits the structure or floristics of a native vegetation community.

2.6.3 Disturbance History

The property has had a long history of disturbance and approximately 100% of the property has had some disturbance in the past. (see Map 1).

2.6.4 Fire History

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

2.7 Vegetation Integrity Assessment

2.7.1 Composition and Structure

A total of 57 plant species were recorded during the field survey for the whole site (see Appendix B), of these 10 are local native species, 17 are planted and 31 weeds. The low number of native species is reflective of the long history of disturbance at the site. A total of 32 plant species were recorded in the 20x20m plot, all of which 7 were local native species, 6 were planted and 19 were weeds. The summary of the floristics of the 20x20m plot are given in Table 5. A summary of the structure of the 20 m x 20 m plot is listed in Table 6. The plant species that occur in the plot and elsewhere on the site are listed in appendix B.

Table 5: Species Richness in each Growth Form and Status for plots

Count	Fern	Herb	Grass	Other	Sedge	Shrub	Tree	Vine	Total
Local Native Species	1	1	1	1	0	0	3	0	**7**
Weed	1	7	3	1	0	6	5	2	**25**
Total	**2**	**8**	**4**	**2**	**0**	**6**	**8**	**2**	**32**

Table 6: Cover (%) of Native Vegetation in each Growth Form in plots

Growth Form	Percent Cover
Tree Cover	37.5
Shrub	0
Grass	0.1
Herb	0.1
Fern	1.5
Other	0.1

2.7.2 Function-habitat Value

The results for tree width diversity, log length and ground cover for the 20m x 50m plot are recorded in Table 8.

Table 7: Fauna Habitat Function Summary for Plots

Plot 1 Function Results		
Tree Stem Size Class		**Log Length Total**
Width Class (cm)		22.55
<5	present	
5 to 9	present	**Number of large trees (50cm+)**
10 to 19	present	0
20 to 29	present	
30 to 49	present	**Number of hollow bearing trees**
50 to 70	absent	0
80+	absent	

Leaf Litter % Cover (in 1m2 subplots)				
Subplot A	**Subplot B**	**Subplot C**	**Subplot D**	**Subplot E**
70%	85%	5%	1%	90%

2.8 Non-threatened Fauna Found

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

Table 8: Non-threatened Fauna Found

Common Name	Scientific Name	Evidence
Birds		
Laughing Kookaburra	*Dacelo novaeguineae*	Observed
Noisy Miner	*Manorina melanocephala*	Observed
Rainbow Lorikeet	*Trichoglossus moluccanus*	Heard
Mammals		
Ring-tail Possum	*Pseudocheirus peregrinus*	Anecdotal
Long-nosed Bandicoot	*Perameles nasuta*	Diggings
Reptiles		
Garden Skink	*Lampropholis guichenoti*	Observed

2.9 Flora and Native Vegetation Types

The tree canopy is dominated by exotic species including the weeds *Liquidambar*, Privet and Camphor Laurel, and the native tree species Cheese Tree and *Pittostrum undulatum*. The shrub layer is sparse and mostly exotic planted species and weeds and there is a patch of rhizomatous Bamboo in the western section. The ground cover layer consists mostly of patches of mown lawn that cover approximately 15% of the site and sparse weeds.

The vegetation on the site is very disturbed and is dominated by unmaintained exotic planted species and weeds. There is very few native species and due to a long history of disturbance the vegetation does not meet the definition of any native vegetation ecological community.

The vegetation on the site and the adjacent reserve is mapped as Coastal Sandstone Gully Forest (PCT 1250) (The Native Vegetation of the Sydney Metropolitan Area (V3 2016 OEH))

Coastal Sandstone Gully Forest is described as a moderately tall open forest dominated by *Angophora costata* and *Eucalyptus piperita* in the canopy with a heath and shrub understorey including Banksias, Tea-trees and Wattles.

The vegetation of the site not match the canopy or shrub species of this community and therefore is not considered to contain Coastal Sandstone Gully Forest. It is likely that the site and the adjacent reserve may have once contained this community.

2.10 Threatened Species

No threatened were observed using the site. It is likely that threatened species that occur in the locality use the site. The likelihood of targeted threatened flora and fauna species occurring on the study area is assessed in Tables 9 and 10.

2.11 Habitat Trees

No trees containing hollows or important food trees for gliders were observed during the survey.

3 Part 2. Impact Assessment

3.1 Description of the Proposal

The proposal is for demolition of the existing buildings and construction of a SEPP 70 boarding house development for 36 dwellings.

The proposal is shown on Map 5 and includes;

- Demolition of the 2 existing buildings
- The removal of 23 trees on the site, one of which is a prescribed native tree (Cheese Tree), others are native tree species that do not meet the definition of a prescribed tree (eg. *Pittostrum undulatum*, *Ficus rubininosa*).
- Construction of a new 2 storey 36 room boarding house with outdoor common
- Construction of an 9 -car underground garage.
- One native tree on the site will be retained (Tree 11, a Cheese Tree), this tree is also a prescribed tree. Adjacent to the property there are several non-native and native tree that will be retained.
- Establishment and maintenance of a bushfire asset protection zone
- Establishment and maintenance of a riparian zone
- Landscaping of gardens

3.1.1 Bushfire Asset Protection

The subject site has been mapped as Bushfire Prone Land and the legislative requirements for building and development on bushfire prone lands are applicable. A bushfire assessment report has been prepared in accordance with the format of Clause 44 of the Rural Fire Regulation 2008 for consideration of a Bushfire Safety Authority under section 100B of the Rural Fires Act 1997.

The Bushfire Risk Assessment by Matthew Toghill, (Dated 25/1/18) identifies that the bushfire threat is from the adjacent Council bushland reserve (Kentwell Road Reserve) to the south-east. The report requires a 23m Asset Protection Zone extending as an arc from the south-eastern corner of the site.

The APZ may be able to be achieved by the following actions adapted from Standards for Asset Protection Zones (NSW Rural Fire Service) for establishing and maintaining an APZ:

1. ***Raking or manual reduction of fine fuels in the APZ part of the site only***

   Ground fuels such as fallen leaves, twigs (less than 6 mm in diameter) and bark should be reduced on a regular basis. This flash fuel burns quickly and increases the intensity of a fire. Fine fuels should be removed by hand. Fine fuel does not include logs or hollows. The leaf litter reduction is not to expose bare earth that may lead to erosion and weed invasion. or,

2. ***mowing or grazing of grass in the APZ part of the site only***

   Where there is lawn, the grass needs to be kept short and, where possible, green. This does not apply to the eastern part of the site that is to be maintained as riparian native vegetation; or,

3. ***removal or pruning of trees, shrubs and understorey in APZ part of the site only***

   All weeds are to be removed every three months by qualified bush regenerators. The control of existing vegetation involves both selective fuel reduction (removal, thinning and pruning) and the retention of vegetation. Prune or remove trees so that you do not have a continuous tree canopy

leading from the hazard to the asset. This can be achieved by separating tree crowns by two to five metres, tree canopy should not overhang within two to five metres of a dwelling. Native trees and shrubs can be retained as clumps or islands and can maintain a covering of up to 20% of the area. All weeds are to be removed then there is to be removal of dead material then thinning of native vegetation if necessary to meet the fuel load requirements.

The APZ on this property can most likely be achieved by:

- Removing weeds from the ground cover and shrub layers.
- Planting suitable low flammability local native ground cover species to improve habitat value and prevent soil loss whilst maintaining low fuel levels.
- Prior to occupation compliance of the APZ needs to be confirmed by the RFS or a qualified Bushfire Consultant.

3.1.2 Vegetation Loss

The site contains a few remnant native plant species (See Appendix B) but does not contain enough plant species or vegetation cover to meet the definition of native vegetation or any native ecological community.

The proposal will remove an area of approximately 1000m^2 of low value fauna habitat which contains; exotic plants, weeds species (Appendix 2, Biosecurity Act 2015) and scattered native plant species.

The arborist (Catriona Mackenzie and Chantalle Hughes January 2018) has determined that 23 trees on the site will be removed. One of these is a prescribed native tree (Cheese Tree), others are native tree species that do not meet the definition of a prescribed tree (eg. *Pittostrum undulatum*, *Ficus rubininosa*).

One native tree on the site will be retained (Tree 11, a Cheese Tree), this tree is also a prescribed tree. Adjacent to the property there are several non-native and native tree that will be retained.

Prescribed trees are defined in Part E1 of the Warringah Development Control Plan 2011 Plan (WDCP).

The Biodiversity Management Plan and the Landscape Plan describe the planting of trees in the gardens, riparian zone and APZ that will in part offset the impact of the tree and habitat loss.

The eastern part of the site has been identified by Council (WDCP) as containing Riparian Land. The area of Riparian Land on the site is 258m^2. The impact to the Riparian Land is discussed in the accompanying Waterway Impact Statement.

An area of the impact from the driveway, the path, the raised lawn, deck and underground access stairs will be located within the mapped riparian zone. This area currently does not contain any native vegetation. See Map 5.

The bushfire, Asset Protection Zone (APZ) overlaps with 58m^2 of the mapped Riparian Zone. See Map 5.

An assessment of the impact to the riparian zone is provided in the accompanying Waterway Impact Statement (GIS Environmental Consultants, Jan 2018).

3.1.3 Avoidance and Minimisation of Impact

The Biodiversity Conservation Act 2016 requires that all developments “Avoid” then “Minimise” ecological impacts. Once all possible impact minimisation and avoidance has been undertaken, then offsetting can be used to offset the remaining impacts of the proposal on the environment.

Discussions were held with the owner and the project manager at the start of the planning of the proposal (in early December before the purchase and on the 14 December 2017) regarding the ecological constraints of the site. The main ecological constraints that have been identified are the adjacent creek line habitat and associated riparian zone and wildlife corridor, the adjacent bushland reserve with its habitat value and the threatened fauna species that have been recorded from the locality.

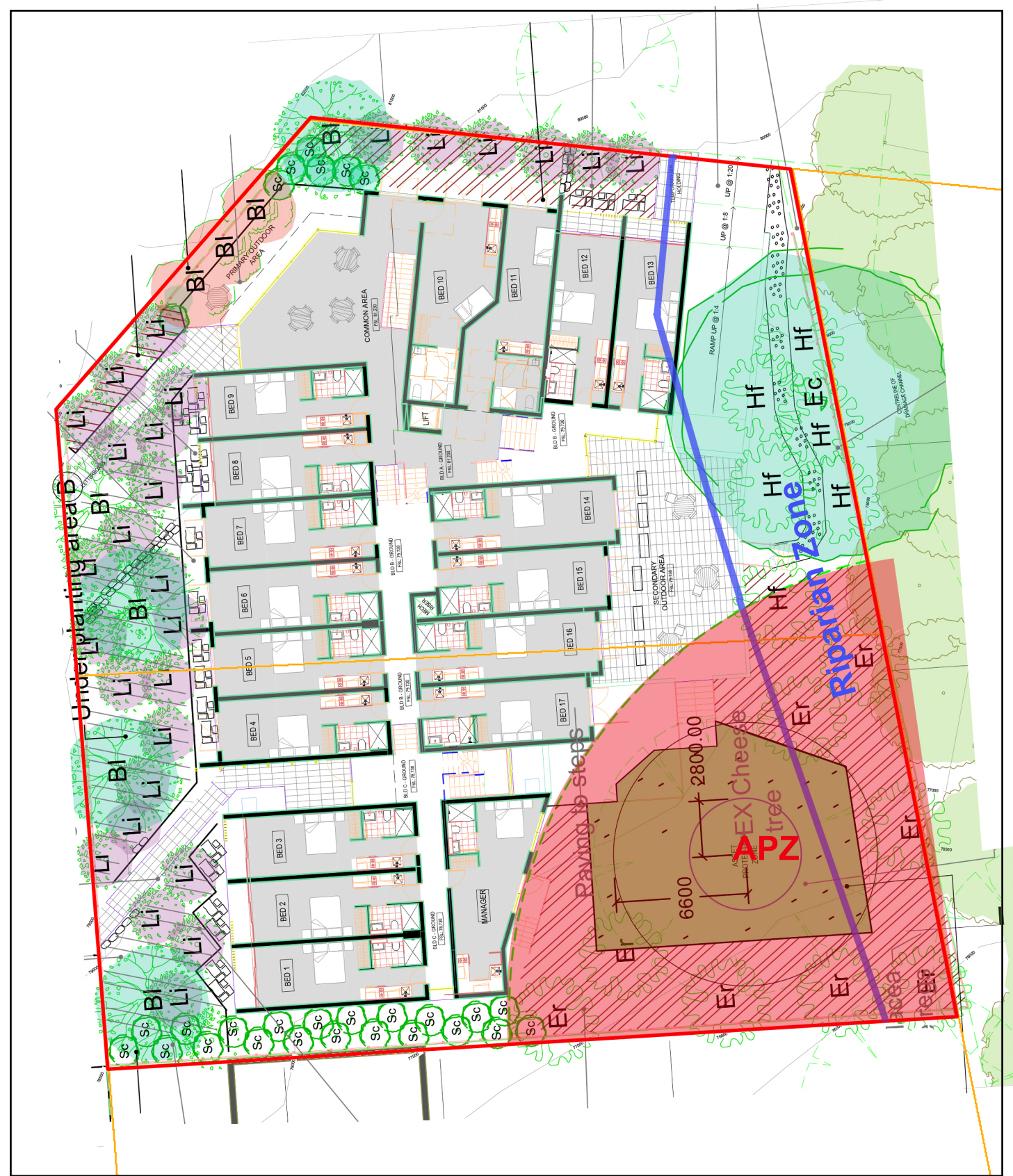
The buildings have been located to include the existing disturbed area and will not disturb any high value bushland habitat. The majority of the proposed dwellings and underground carpark are located on the western side of the property away from the riparian zone.

Due to the adjacent downhill drainage line, there will need to be particular attention paid to sediment

control during construction and for the life of the development. This will need to ensure that sediment, nutrients, or exotic plants seeds do not leave the site and harm the adjacent ecological values of the downslope native vegetation and water quality downstream into Manly Creek and to Manly Lagoon.

The Landscape plan shows 3 types of planting, the north eastern and south eastern are in the Riparian and APZ part of the site.

The northern area with one large tree (Eucalyptus (sic) citriodora) and 5 small (Hymenosporum flavum) trees with a ground cover of the sedge Lomandra Tanika, none of which are local native species. The south-eastern area contains the retained local native Cheese Tree (tree 11), a Buffalo grass raised area, a shrub planting of the local native *Eleocarpus reticulatus* with a ground cover of the local native vine *Hardenbergia violacea* with a low flammability hardwood chip mulch. The planting immediately around the building which is a mostly local native shrub and ground cover species. These areas will provide medium level of habitat value.



Legend

60 Binalong Ave

Map 5
Proposal and Impacts

60 Binalong Ave, Allambie Heights

Date: 29/01/2018

N

0 1.75 3.5 7 m

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.

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3.2 Threatened Ecological Communities

3.2.1 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.

3.2.2 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. There are often different classification interpretations and the newest is not necessarily the best. 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. These maps are based on aerial photography and normally little local field verification. They were produced for regional planning and are often not of an appropriate scale to be relied on for a DA proposal. 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), description were used to assist to determine if any EECs occur in the study area. The floristics were also compared to the document 'Vegetation of the Sydney Metropolitan Area' by OEH 2016.

Comparison Method: Comparison of the ecological features on the site to the environmental description in the legal definition of the Endangered 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).

3.2.3 Occurrence of EECs in this Study Area

Several Endangered Ecological Communities (EECs) are mapped in the locality including Coastal Upland Swamps EEC, Duffys Forest EEC and Swamp Oak Floodplain Forest EEC. As the vegetation on the site is not conserved to native vegetation It is unlikely that any of these EEC occur on the study site.

3.3 Flora

3.3.1 Assessment of Threatened Flora Species

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

Table 9: Habitat Suitability for Targeted Threatened Flora Species

Scientific Name	Habitat Preference	Likelihood of Occurrence
Acacia terminalis subsp. terminalis	Grows in coastal scrub and dry sclerophyll woodland on sandy soils. Most habitat sites are highly modified or disturbed due to	Historic Records: Nearest records approximately 2.2km east of the site.

	surrounding urban development. Flowers in autumn. Small birds and bees are natural pollinators.	Habitat Value: **Low** habitat value. No suitable habitat occurs onsite 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.	Historic Records: 30 records within 5km of the site. No nearby records. Habitat Value: **Low** suitable habitat occurs within study site. Occurrence Onsite: Not found during survey. Very obvious species. 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.	Historic Records: Twenty-six records with 5km of the site. No nearby records. Habitat Value: **LoW** quality habitat occurs within study site. Occurrence onsite: Targeted during survey. **Not found** during survey. Direct and Indirect Impacts: **Unlikely**. Conclusion: **No further assessment required.**
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.	Historic Records: Nearest records 1.2km south-west in Manly Warringah War Memorial Park. Habitat Value: **Low** quality habitat occurs within study site. Occurrence Onsite: Targeted during survey. **Not found** during survey. Cryptic species 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.	Historic Records: There is a fairly recent record (2002) within 1km north-west of the site. Habitat Value: **Medium** quality habitat occurs within study site. Occurrence Onsite: Targeted during survey. Very obvious species. **Not found** during survey. Direct and Indirect Impacts: **Unlikely**. Conclusion: **No further assessment required.**
Tetratheca glandulosa	Found in Sydney Sandstone Ridge top Woodland in sandy or rocky heath scrub. Often associated with a sandstone/shale interface where soils have a stronger clay influence. Seasonal and cryptic.	Historic Records: One record (1996) within 1km north-west of the site. Habitat Value: **Low** value habitat occurs within study site. Occurrence Onsite: Cryptic and seasonal. Site was adequately searched. **Not found during survey.** Direct and Indirect Impacts: **Unlikely**. Conclusion: **No further assessment required.**

3.4 Fauna

3.4.1 Description of Fauna Habitat

The site contains mostly exotic tree species and a few native *Pittosporum undulatum* and *Glochidion ferdinandi* that provide foraging and roosting habitat for native birds and habitat for possums.
The site is likely to be part of a large foraging home range for owls but does not contain any suitable nesting of roosting habitat. The adjacent drainage reserve is likely to contain suitable nest/roosting habitat for owls.

There are some fallen logs with hollows at the site that provide habitat for small reptiles such as skinks and lizards.

The site contains good quality foraging habitat for long-nosed bandicoots and many diggings were observed on the property during the site survey.

The site contains a small *Ficus rubiginosa* tree along the north-western boundary which provides foraging habitat for several native species including the threatened Grey-headed Flying-fox

There are no caves on the property but the old dwellings are potential roosting habit for microbats.

3.4.2 Assessment of Threatened Fauna Species

Table 10: Habitat Suitability for Targeted Threatened Fauna Species

Common Name	Habitat Preference	Potential to occur within the study area
Amphibians		
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: Nearest record 400m south-west of site (2014). Importance of site: **Low** quality habitat occurs on this site due to non-suitable habitat. **No further assessment required.**
Aves		
Glossy Black-Cockatoo *Calyptorhynchus lathami*	Inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1000 m in which stands of She-oak species, particularly Black She-oak (*Allocasuarina littoralis*), Forest She-oak (*A. torulosa*) or Drooping She-oak (*A. verticillata*) occur. 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: Nearest record 2km north-west of the site (2007) Importance of site: **Low**. No food trees on site. No nesting hollows found during survey. No evidence of species using the site for foraging. Known to occur in the locality. **No further assessment required.**
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	Historic records: 4 records within 5km. No nearby records. Importance of site: **Low**. Medium quality habitat along Creekline adjacent to the study area. No suitable roosting or nesting habitat

Common Name	Habitat Preference	Potential to occur within the study area
	clumps of canopy leaves in large Eucalypts. Feeds on a variety of prey, with invertebrates predominant for most of the year, and birds and mammals such as smaller gliders, possums, rodents and rabbits becoming important during breeding.	onsite. Possibly part of a large home range. **No further assessment required.**
Masked Owl ***Tyto novaehollandiae***	Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting. Lives in dry eucalypt forests and woodlands from sea level to 1100 m. Hunts tree-dwelling and ground mammals, especially rats along the edges of forests, including roadsides.	Historic records: One record within 5km. No nearby records. Importance of site: **Low**. No roosting habitat on site. No evidence of roosting or nesting found during survey. Site likely to be part of large foraging home-range. **No further assessment required.**
Powerful Owl *Ninox strenua*	Nests in large tree hollows. Inhabits large tracts of forest in a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. Roosts along creek lines. Feeds on medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider.	Historic records: Recent record (2014) less than 350m east of the site. Many records in the locality. Importance of site: **Low**. No suitable nesting hollows onsite. Site immediately adjacent to a permeant open drainage line. No evidence of roosting or nesting found during survey. The Site is likely to be part of large foraging home-range and contains potential roosting habitat. **No further assessment required**.
Sooty Owl *Tyto tenebricosa*	Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests. Roosts by day in the hollow of a tall forest tree or in heavy vegetation; hunts by night for small ground mammals or tree-dwelling mammals such as the Common Ringtail Possum (Pseudocheirus peregrinus) or Sugar Glider (Petaurus breviceps). Nests in very large tree-hollows.	Historic Records: 3 records within 5km. No nearby records. Importance of Site: **Low.** Low suitable habitat. No suitable roosting or nesting habitat onsite. Site may be used as part of a large foraging home range. **No further assessment required.**
Mammalia		
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,	Historic Records: Recent record (Nov 2017) less than 1km west of the site. Importance of site: **Low**. Site does not contain suitable habitat. No food trees onsite. Not recorded during field survey. **No further assessment required.**

Common Name	Habitat Preference	Potential to occur within the study area
	possum dreys or thickets of vegetation.	
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: 3 recent records (2014-2016) within 1km north-east of the site. Importance of site: **Medium**. Site likely to be a small part of a large foraging home range. The old dwellings are potential roosts. **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: 5 records with 5km. no nearby records. Importance of site: **Low**. No suitable roosting habitat on site. Adjacent drainage reserve contain potential roosting habitat and medium value foraging habitat. **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: Nearest record 400m south (2012) Importance of site: **Medium.** No roosts occur on site. Likely to forage or fly over as there are known colonies in the locality. Site contain a small sized Ficus rubiginosa that will be removed. **Further assessment in the form of a 5-part test 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: Nearest record less than 650m south of site (2002) Importance of site: **Low**. No suitable habitat onsite. No termite mounds onsite. **No further assessment required.**

3.5 Impact on Wildlife Corridor

The majority of the site is mapped on the Warringah DCP 2011 Wildlife Corridors Map. The site is connected to the adjacent drainage reserve which partly connects the bushland in the west (War Memorial Park) and to the east (Allenby Park) via remanet vegetation in residential backyards.

The site is considered to have low wildlife corridor value due its disturbed nature and disturbed residential properties bordering it on three sides.
The proposal will unlikely impact movement to the adjacent drainage reserve. The proposal will unlikely

impact the movement of species that currently use the site as part of their home range including birds and possibly bats, as these are all highly mobile species.

3.6 Loss of Tree Hollows

More than 300 species of Australian native animals (mammals, birds, reptiles and amphibians) use tree hollows for nesting (Gibbons et al, 2002). Some eucalypts develop hollows at all ages, but in some cases, tree hollows suitable for vertebrate fauna may take up to 250 years to develop. The loss of tree hollows is a key threatening process for many native species and should be avoided where possible.

No trees containing hollow were observed during the field surveys.

3.7 Environment Protection and Biodiversity Conservation Act 1999

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

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

The report lists the following ecologically relevant items:

- 4 Threatened Ecological Communities
- 79 Threatened species
- 50 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.

Eight (8) of the species from the targeted species are listed as Endangered or Vulnerable in the Federal EPBC Act. These species have been assessed under TSC Act criteria in this Flora and Fauna Impact Assessment report. The assessments concluded that no significant impacts are likely to occur to those species as a result of the proposal and a similar conclusion was also reached after consideration of the Commonwealth criteria. It is recommended that this proposal does not need to be referred to Environment Australia.

3.8 Northern Beaches Council (Warringah) DCP 2011 Assessment

3.8.1 Part E2 Prescribed Vegetation

Objectives

• *To preserve and enhance the area's amenity, whilst protecting human life and property.*

The proposal requires that an APZ be established and maintained in the south-eastern corner of the property to protect the new dwelling. Some of the APZ is mapped as Riparian Land in the Warringah DCP 2011 Riparian Lands Map. The area within the APZ will also be subject to the Biodiversity Management Plan (BMP, GIS Environmental Consultants) for the property. The BMP and the Landscape Plan will include the planting of some local native plants, suitable for the APZ requirements, to improve to ecological value of the Riparian Land.

• *To improve air quality, prevent soil erosion, assist in improving water quality, carbon sequestration, storm water retention, energy conservation and noise reduction.*

It is recommended that the proposal include sediment control during demolition and construction to prevent sediment from entering the adjacent drainage reserve. Sediment control is detailed in the

Ameliorative Measure and Recommendations section of this report and the Biodiversity Management Plan (GIS Environmental Consultants)

• *To provide habitat for local wildlife, generate shade for residents and provide psychological & social benefits.*

One native tree (Cheese Tree) will be retained in the south-eastern corner of the site. This will provide very little shade for the residents. The Landscape Plan and Biodiversity Management Plan includes the planting of some native trees, shrub and groundcover to improve habitat and maintain a continuation of the tree canopy in the adjacent reserve.

• *To protect and promote the recovery of threatened species, populations and endangered ecological communities.*

The proposal will not remove any important habitat for threatened species or endangered ecological communities. The Landscape Plan and Biodiversity Management Plan includes the planting of some native trees, shrub and groundcover to improve habitat.

• *To protect and enhance the habitat of plants, animals and vegetation communities with high conservation significance.*

The proposal will not remove any important habitat for threatened species or endangered ecological communities. The proposal will impact some mapped Riparian Land. The Landscape Plan and Biodiversity Management Plan includes the planting of some native trees, shrub and groundcover to improve habitat and the value of the Riparian Land.

• *To retain and enhance native vegetation communities and the ecological functions of wildlife corridors.*

The vegetation on the site is not conserved to be native vegetation. The proposal will remove vegetation from within a mapped wildlife corridor several trees that are native species including *Pittosproum undulatum,* Cheese tree and a *Ficus rubiginosa*. This is not considered to significantly disrupt the movement of species that use the wildlife corridor including birds and possums. The Landscape Plan and Biodiversity Management Plan includes the planting of some native trees, shrub and groundcover to improve habitat

• *To reconstruct habitat in non-vegetated areas of wildlife corridors that will sustain the ecological functions of a* wildlife corridor *and that, as far as possible, represents the combination of plant species and vegetation structure of the original 1750 community.*

The Landscape Plan and Biodiversity Management Plan includes the planting of some native trees, shrub and groundcover to improve habitat and function of the wildlife corridor.

• *Promote the retention of native vegetation in parcels of a size, condition and configuration which will as far as possible enable plant and animal communities to survive in the long-term.*

The vegetation on the site is not considered to be native vegetation. The proposal will remove several trees that are native species including *Pittosproum undulatum,* Cheese tree and a *Ficus rubiginosa.*

Conclusion: The proposal generally meets the objectives of Part E2 “Prescribed Vegetation” of the Warringah DCP 2011.

3.8.2 Part E4 Wildlife Corridors

Objectives

• *To preserve and enhance the area’s amenity, whilst protecting human life and property.*

The proposal requires that an APZ be established and maintained in the south-eastern corner of the property to protect the new dwelling. Some of the APZ is mapped as Riparian Land in the Warringah DCP 2011 Riparian Lands Map. The area within the APZ will also be subject to the Biodiversity Management Plan (BMP, GIS Environmental Consultants) for the property. The BMP and the Landscape Plan will

include the planting of some local native plants, suitable for the APZ requirements, to improve to ecological value of the Riparian Land.

• *To improve air quality, prevent soil erosion, assist in improving water quality, carbon sequestration, storm water retention, energy conservation and noise reduction.*

It is recommended that the proposal include sediment control during demolition and construction to prevent sediment from entering the adjacent drainage reserve. Sediment control is detailed in the Ameliorative Measure and Recommendations section of this report and the Biodiversity Management Plan (GIS Environmental Consultants)

• *To provide natural habitat for local wildlife, maintain natural shade profiles and provide psychological & social benefits.*

One native tree (Cheese Tree) will be retained in the south-eastern corner of the site. This will provide very little shade for the residents. The Landscape Plan and Biodiversity Management Plan includes the planting of some native trees, shrub and groundcover to improve habitat and maintain a continuation of the tree canopy in the adjacent reserve.

• *To retain and enhance native vegetation and the ecological functions of wildlife corridors.*

The Landscape Plan and Biodiversity Management Plan includes the planting of some native trees, shrub and groundcover to improve habitat and maintain a continuation of the tree canopy in the adjacent reserve.

• *To reconstruct habitat in non vegetated areas of wildlife corridors that will sustain the ecological function of a* wildlife corridor *and that, as far as possible, represents the combination of plant species and vegetation structure of the original 1750 community. See Warringah Natural Area Survey, August 2005.*

The Landscape Plan and Biodiversity Management Plan includes the planting of some native trees, shrub and groundcover to improve habitat and function of the wildlife corridor.

Conclusion: The proposal generally meets the objectives of Part E4 “Wildlife Corridors” of the Warringah DCP 2011.

3.8.3 Part E6 Retaining Unique Environmental Features

Objectives

• *To conserve those parts of land which distinguish it from its surroundings.*

The site has a native reserve and Creekline running along the eastern side of the property. If the recommendations on this report and the Biodiversity Management Plan are followed then this will not be adversely impacted by the proposal.

Requirements

1. Development is to be designed to address any distinctive environmental features of the site and on adjoining nearby land.

The site has a native reserve and Creekline running along the eastern side of the property. If the recommendations on this report and the Biodiversity Management Plan are followed then this will not be adversely impacted by the proposal.

2. Development should respond to these features through location of structures, outlook, design and materials.

The site has a native reserve and Creekline running along the eastern side of the property. The majority of the building and OSD will occur outside of the Riparian Zone. Part of the driveway and the APZ will occur with the Riparian Zone.

Conclusion: The proposal generally meets the objectives and requirements of Part E6 "Retaining unique environmental features" of the Warringah DCP 2011.

3.8.4 E7 Development on Land Adjoining Public Open Space

Objectives

1. *To protect and preserve bushland adjoining parks, bushland reserves and other public open spaces.*

The site has a native reserve and Creekline running along the eastern side of the property. If the recommendations on this report and the Biodiversity Management Plan are followed then this will not be adversely impacted by the proposal.

2. To ensure that development responds to its adjacent surroundings to preserve and enhance the natural qualities of the environment.

The site has a native reserve and Creekline running along the eastern side of the property. If the recommendations on this report and the Biodiversity Management Plan are followed then this will not be adversely impacted by the proposal. The development will be built along the northern and western boundary and mostly outside of the Riparian Land. Part of the driveway and the APZ will occur within the Riparian Land.

3. Development on land adjoining open space is to complement the landscape character and public use and enjoyment of the adjoining parks, bushland reserves and other public open spaces.

The adjacent drainage reserve is not likely to be used by the public. The reserve contains some native species and weeds. The Landscaped and open area on the property will be immediately adjacent to the reserve and will include the planting of some native species to improve the habitat value.

Requirements

1. Development on land adjoining public open space is to complement the landscape character and public use and enjoyment of the adjoining parks, bushland *reserves and other public open spaces.*

The adjacent drainage reserve is not likely to be used by the public. The reserve contains some native species and weeds. The Landscaped and open area on the property will be immediately adjacent to the reserve and will include the planting of some native species to improve the habitat value.

2. Public access to public open space is to be maximised.

The development on the property will not change access to the reserve.

3. Buildings are to be located to provide an outlook to public open space, without appearing to privatise that space.

The development will be built along the northern and western boundary and mostly away from the reserve boarder the eastern boundary.

4. Development is to provide a visual transition between open space, bushland *reserves or other public spaces and buildings, including avoiding abutting public open space with back fences.*

There are no fences proposed. The Landscaped and open area on the property will be immediately adjacent to the reserve and will include the planting of some native species to improve the habitat value.

5. Development is to protect views to and from public open space.

There are no fences proposed. The Landscaped and open area on the property will be immediately adjacent to the reserve and will include the planting of some native species to improve the habitat value.

6. Development is to provide buffers for bushfire protection on private land, not on public land.

The development will be built along the western and northern boundaries to minimise the APZ. A 23m wide APZ will extend from the south-eastern corner of the property and will not occur on public land.

7. If the adjoining parks, bushland *reserves or public open space contain* bushland*, development is not to threaten the protection or preservation of the* bushland*.*

The adjacent reserve contains a mixture of native and exotic species. The Landscaping includes the planting of some native species adjacent to the reserve and the Biodiversity Management Plan outlines weed and sediment control methods to prevent the spread of weeds and sediment into the adjacent creek line and riparian land.

8. Development should be designed to maximise opportunities for casual surveillance of the public open space.

There are no fences proposed. The Landscaped and open area on the property will be immediately adjacent to the reserve and will include the planting of some native species to improve the habitat value.

9. Development is to utilise landscaping or existing landscape elements to screen development.

The Landscape Plan includes planting of shrubs to screen the development from adjacent properties.

Conclusion: The proposal generally meets the objectives and requirements of Part E "Development on Land Adjoining Public Open Space" of the Warringah DCP 2011.

3.9 Assessment of Significance 5-Part Test

No Threatened ecological communities were found during the field survey.

No Threatened flora or Fauna species were found during the field survey.

A 5-Part Test of Significance was completed for the threatened Grey-headed Flying-fox (*Pteropus poliocephalus*). See Appendix A. No other important habitat for other Threatened species was identified during the survey.

3.9.1 5-part Tests of Significance Conclusions

The 5-part test, Assessment of Significance for the threatened Gang-gang Cockatoo Grey-headed Flying-fox (*Pteropus poliocephalus*) concluded that the complete proposal including the bushfire APZ is unlikely to have a significant effect and a Biodiversity Development Assessment Report (BDAR) is not recommended in relation to this proposal. These conclusions are reliant on the assumptions stated in this report.

3.10 Biodiversity Conservation Act BAM Threshold Assessment

The part of the site that is likely to be disturbed is shown on Map 5.

This proposal is **not** considered to meet the BC Act threshold as;

1) The integrity score for the vegetation on the site is below the value that would classify it as native vegetation, therefore, the amount of native vegetation that will be disturbed by this proposal is **0ha**. There are two lots impacted by this proposal and these have a lot size of **0.09ha and 0.08ha**. The amount of disturbance to native vegetation in these lot is 0ha which is below the threshold limit for this size of lot. There are no other lots involved in the DA. Therefore this proposal does not trigger this threshold limit. **and**
2) The *Biodiversity Conservation Regulation 2017,* Biodiversity Values Map (BV Map) identifies land with high biodiversity value, as defined by the *Biodiversity Conservation Regulation 2017*. The Biodiversity Offsets Scheme applies to all local developments, major projects or the clearing of native vegetation where the *State* Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 applies. Any of these will require entry into the Biodiversity Offsets Scheme if they occur on land mapped on the Biodiversity Values Map. The area of impact is **not** mapped on the "Biodiversity Values" Map as having high biodiversity value. **and**
3) There is **not** likely to be a significant affect (5-part assessment of significance test Section 7.3, BC Act) on Threatened species or ecological communities or their habitats as has determined by this report. See Appendix A of this report for the 5 part tests.

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

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

3.11 Biodiversity Impact Conclusions

In the planning and design of this proposal, measures were taken to avoid and minimise environmental impacts. The legislation (BC Act and EP&A Act) require that proactive planning need to be taken to avoid and minimise environmental impacts. In this project the constraints were taken into consideration the ecological constraints of the site during discussions with the author of this report, the scale and placement of the proposal and amelioration of the impacts (tree retention, landscaping, . The proposal described in this report not likely to have a significant effect to any threatened species, population or ecological community and none of the BC Act thresholds are met, therefore a Biodiversity Development Assessment Report (BDAR) is not recommended in relation to this proposal. It must be noted that this conclusion only applies to the proposal described in this report, the assumptions made in this report and the development shown on the Maps in this report. The recommendations below should be followed to further reduce the impact of the proposal on the ecological values within the study area.

The ecological impact of the proposal is not likely to be an unacceptable impact by itself under Section 79C of the EPA Act or to have a significant impact under part 5A.

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

The proposal meets the requirements and objectives of parts E2, E4, E6 and E7 of the Warringah DCP 2011.

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

4 Part 3. Ameliorative Conditions & Recommendations

4.1 Prior to Construction

- Prior to construction and for the duration of construction there is to be a temporary Environment Protection Zone fence installed 1m outside the the edge of footprint of the built upon area that is within the riparian zone, to prevent heavy machinery accessing this areas and prevent the stockpiling of materials. The fence is to have signage every 4m stating “Environment Protection Riparian Area, no construction access or stockpiling of materials or fill”.
- Sediment control devices such as sediment fences, is to be in place prior to the commencement of construction and should be in place and maintained for the duration of construction. They are only to be removed when the permanent erosion control measures have been installed and are established.
- The tree protection fence around tree 11 is to be installed before any heavy machinery enters the site. All native trees to be retained that are within 10 m of the construction site are to be protected by having the drip line below the canopy of the tree fenced during construction. The Tree Protection Zone (TPZ) must be fenced in accordance with AS4970 – 2009 for the duration of the works. To prevent the damage to tree to be retained.
- Prior to issue of the construction certificate there is to be primary weed control, herbicide treatment (of weeds only) and preliminary mulching with weed free, wood chip in the riparian area within the site. All native plants are to be retained. This is to prevent the spread of weeds during construction and erosion and sedimentation of disturbed areas.
- The parts of the riparian zone that are inside the Environment Protection Zone are to be planted to a

density of 5 plants per square metre as specified in the Bushland Management Plan. The plants are to be tube stock propagated from local native stock from the list in the Bushland Management Plan. Plants are to be watered regularly and any deaths are to be replaced. This is to prevent the spread of weeds during construction and erosion and sedimentation of disturbed areas.

- A minimum of 30 linear metres of logs are to retained in the riparian area within the site and secured to pegs to improve the habitat value of the riparian area. It should be noted that logs are not flash fuel and do not conflict with the requirements for an APZ, and are important habitat for fauna.
- The protection of native plants, herbicide treatment, planting, watering, mulching, and log retention works described in the Biodiversity Management Plan that are to occur prior to construction are to be carried out by a qualified bush regenerator..

4.2 During Construction

- There is to be sediment fencing around all stockpiles to prevent sedimentation of the creek line.
- Weeds are to be controlled on the whole property every 3 months during construction by qualified bush regenerators to prevent the spread of weeds during construction and to assist in the establishment of the environment protection and landscaped areas. A weed cover of less than 1% is to be achieved.
- The riparian and landscaped areas are to be re mulched at the end of construction. At no time is the soil to be left bare as this will cause soil erosion and encourage the rapid growth of flammable weeds.
- The works described in the Biodiversity Management Plan that are to during construction are to be carried out.
- There is to be no earthworks during wet weather.
- Any dewatering of the below ground excavation is to be clear water only. It may be necessary to use a flocculent and floating pump. This is to ensure the water quality and prevent environmental damage to the creek line habitat.

4.3 After Construction and Management of Retained Vegetation

- Ongoing 3 monthly weed control is be carried out across the property to 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 construction. 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. See Biodiversity Management Plan for specifications.
- The ongoing maintenance described in the Biodiversity Management Plan are to be carried out.

5 References

Australian Standard 4970 – 2009 Protection of Trees on Development Sites

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6 Appendix A: 5-part Tests of Significance

6.1 Making an assessment of significance (DECC Guidelines 2007)

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

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

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

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

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

pre-construction, construction and occupation/maintenance phases

all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones

all direct and indirect impacts

the frequency and duration of each known or likely impact/action

the total impact which can be attributed to that action over the entire geographic area affected, and over time

the sensitivity of the receiving environment

the degree of confidence with which the impacts of the action are known and understood.

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

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

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

Life cycle*: the series or stages of reproduction, growth, development, ageing and*

death of an organism.

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

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

. *The local population of a threatened plant species comprises those individuals occurring in the study area or the cluster of individuals that extend into habitat adjoining and contiguous with the study area that could reasonably be expected to be cross-pollinating with those in the study area.*

- *The local population of resident fauna species comprises those individuals known or likely to occur in the study area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the study area.*
- *The local population of migratory or nomadic fauna species comprises those individuals that are likely to occur in the study area from time to time. In cases where multiple populations occur in the study area, each population should be assessed separately.*

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

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

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

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

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

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

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

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

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

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

6.2 Assessment of Significance (5-Part Test) for the Grey-headed Flying-fox (Pteropus poliocephalus)

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

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

The local population is likely to be viable. The nearest record is approximately 400m south of the site (2012). The nearest known roost is in Balgowlah approximately 2km south of the site.

The site does not contain any known bat roost or breeding population. The site provides some potential foraging habitat includes a small native fig (*Ficus rubiginosa*) and a *Melaleauca* (just outside the site). The *Ficus rubiginosa* tree will be removed for the proposed development.

Due to amount of similar suitable foraging habitat in the locality it is unlikely that the removal of the fig tree will have a significant adverse impact on the life cycle of this species such that the local population will be placed at risk of extinction.

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

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

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

Response: The Grey-headed Flying-fox is not listed as an Endangered Ecological Community and therefore this question does not apply.

(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

The development will remove some potential foraging habitat including a small *Ficus rubiginosa* tree.

(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

Grey-headed Flying-foxes are highly mobile animal and it is unlikely that the removal of the foraging habitat or other habitat on the property will fragment or isolate the flying-foxes from suitable habitat in the locality.

(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,

The forging habitat on the site is not considered to be important habitat due to the small amount and the large amount of similar habitat in locality. There is no roosting or breeding colony on the property.

(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.

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

Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands

The site is adjacent to a creek line that is constantly flowing. If the sediment control measures in the Biodiversity Management Plan and the recommendations of this report are followed than the development will unlikely impact the creek.

The proposal will unlike result in the increase of the impact of a Key Threatening Process.

Conclusion to the 5-part test of significance for the impact of the proposed development on the local population of Grey-headed Flying-fox

The local population is likely to be viable. The nearest record is approximately 400m south of the site (2012). The nearest known roost is in Balgowlah approximately 2km south of the site.

The site does not contain any known bat roost or breeding population. The site provides some potential foraging habitat includes a small native fig (*Ficus rubiginosa*) and a Melaleauca (just outside the site). The *Ficus rubiginosa* tree will be removed for the proposed development.

Due to amount of similar suitable foraging habitat in the locality it is unlikely that the removal of the fig tree will have a significant impact on the local population of Grey-headed Flying-foxes. A Biodiversity Development Assessment Report (BDAR) is not considered necessary for this development.

7 Appendix B: Plant Species List

Appendix B. Plant Species in Each Vegetation Zone

60 Binalong Ave, Allambie Heights
January 2018
by Nichlas Skelton, GIS Environmental Consultants

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Summary of Growth Form Cover for the Plot

Sum of Cover % Row Labels	Column Labels I Native Sp	Planted	Weed	Grand Total
Fern	1.5		1	2.5
Grass	0.1		5.1	5.2
Herb	0.1	0.1	0.7	0.9
Palm	0.1	0.1		0.2
Shrub		0.5	28.2	28.7
Tree	37.5	40.5	2.6	80.6
Vine		0.1	0.1	0.2
Grand Total	**39.3**	**41.3**	**37.7**	**118.3**

Part of Site	Cover %	Genus and Species	Family	Growth Form	Common Name	Status
Plot 1	0.1	Archontophoenis cunninghamiana	ARECACEAE	Palm	Bangalow Palm	Local Native Species
Plot 1	0.1	Asparagus aethiopicus	ASPARAGACEAE	Herb	Asparagus Fern	Weed
Plot 1	0.5	Brachychiton acerifolius	STERCULIACEAE	Tree	Flame Tree	Local Native Species
Plot 1	0.1	Bromeliad	BROMELIACEAE	Herb	Bromeliad	Planted
Plot 1	0.1	Chlorphytum comosum	LILLIACEAE	Herb	Spider Plant	Weed
Plot 1	2	Cinnamomum camphora	LAURACEAE	Tree	Camphor Laurel	Weed
Plot 1	0.5	Citrus X paradisi	RUTACEAE	Tree	Grapefruit	Planted
Plot 1	0.1	Commelina cyanea	COMMELINACEAE	Herb	Creeping Christian	Local Native Species
Plot 1	0.1	Convolvulus erubescens	CONVOLVULACEAE	Vine	Australian Bindweed	Weed
Plot 1	0.1	Cotoneaster pannosus	ROSACEAE	Shrub	Cotoneaster	Weed
Plot 1	0.1	Cynodon dactylon	POACEAE	Grass	Common Couch	Local Native Species
Plot 1	4	Ehrharta erecta	POACEAE	Grass	Ehrharta	Weed
Plot 1	0.5	Erythrina crista-galli	FABACEAE	Tree	Cockspur Coral Tree	Weed
Plot 1	35	Glochidion ferdinandi var. ferdinandi	EUPHORBIACEAE	Tree	Cheese Tree	Local Native Species
Plot 1	0.1	Hedychium gardnerianum	ZINGIBERACEAE	Herb	Ginger Lily	Weed
Plot 1	0.5	Hibiscus sp.	MALVACEAE	Shrub	Hibiscus	Planted
Plot 1	1.5	Lastreopsis decomposita	DRYOPTERIDACEAE	Fern	Trim Shield Fern	Local Native Species
Plot 1	25	Ligustrum lucidum	OLEACEAE	Shrub	Privet - broad leaved	Weed
Plot 1	2	Ligustrum sinense	OLEACEAE	Shrub	Privet - narrow leaved	Weed
Plot 1	40	Liquidambar styraciflua	ALTINGIACEAE	Tree	Liquidambar	Planted
Plot 1	0.2	Monstera deliciosa	ARACEAE	Herb	Swiss Cheese Plant	Weed
Plot 1	1	Nephrolepis cordifolia	DAVALLIACEAE	Fern	Fishbone Fern	Weed
Plot 1	1	Ochna serrulata	OCHNACEAE	Shrub	Ochna, Mickey Mouse Pl	Weed
Plot 1	0.1	Philodendron bipinnatifidum	ARACEAE	Herb	Philodendron	Weed
Plot 1	0.1	Phoenix canariensis	ARECACEAE	Palm	Canary Island Date Palm	Planted
Plot 1	1	Phyllostachys sp.	POACEAE	Grass	Rhizomatous Bamboo	Weed
Plot 1	2	Pittosporum undulatum	PITTOSPORACEAE	Tree	Sweet Pittosporum	Local Native Species
Plot 1	0.1	Prunus sp.	ROSACEAE	Tree	Stonefruit	Weed
Plot 1	0.1	Senna floribunda	CAESALPINIOIDEAE	Shrub	Cassia	Weed
Plot 1	0.1	Stenotaphrum secundatum	POACEAE	Grass	Buffalo Grass	Weed
Plot 1	0.1	Syngonium sp.	ARACEAE	Herb	Syngonium	Weed
Plot 1	0.1	Wistaria sinensis	FABACEAE	Vine	Wistaria	Planted
Additional		Acer palmatum		tree	Japanese Maple	Planted
Additional		Ageratina adenophora	ASTERACEAE	Herb	Crofton Weed	Weed
Additional		Brassaia actinophylla	ARALIACEAE	Shrub	Umberella Tree	Weed
Additional		Camellia sasanqua	THEACEAE	Tree	Camellia	Planted
Additional		Cordyline congesta	ASTELIACEAE	Shrub	Native Cordyline	Local Native Species
Additional		Crassula multicava	CRASSULACEAE	Herb	Fairy Crassula	Weed
Additional		Dicksonia antarctica	DICKSONIACEAE	Fern	Soft Tree Fern	Local Native Species
Additional		Epidendrum ibaguense	ORCHIDACEAE	Herb	Crucifix Orchid	Planted
Additional		Ficus rubiginosa	MORACEAE	Tree	Port Jackson Fig	Local Native Species
Additional		Fraxinus sp.		Tree	Ash	Weed
Additional		Geranium sp.	GERANIACEAE	Herb	Geranium	Weed
Additional		Hedera helix	ARALIACEAE	Vine	English Ivy	Planted
Additional		Jacaranda mimosifolia	BIGNONIACEAE	Tree	Jacaranda	Planted
Additional		Lagerstroemia indica	LYTHRACEAE	Tree	Crepe Myrtle	Planted
Additional		Lantana camara	VERBENACEAE	Shrub	Lantana	Weed
Additional		Lilium formosanum	LILIACEAE	Herb	Formosan Lily	Weed
Additional		Lonicera japonica	CAPRIFOLIACEAE	Vine	Japanese Honeysuckle	Weed
Additional		Magnolia sp.	MAGNOLIACEAE	Tree	Magnolia	Planted
Additional		Morus alba	MORACEAE	Tree	White Mulberry	Weed
Additional		Nandina domestica	BERBERIDACEAE	Shrub	Sacred Bamboo	Weed
Additional		Nerium oleander	APOCYNACEAE	Shrub	Oleander	Planted
Additional		Pentas lanceolata	RUBIACEAE	Shrub	Pentas	Planted
Additional		Plumeria lutea	APOCYNACEAE	Tree	Frangipanni	Planted
Additional		Rhododendron sp.	ERICACEAE	Shrub	Azalea	Weed
Additional		Taraxacum officinale	ASTERACEAE	Herb	Dandelion	Weed
Additional		Tibouchina sp.	MELASTOMATACEAE	Shrub	Tibouchina, Lasiandra	Planted