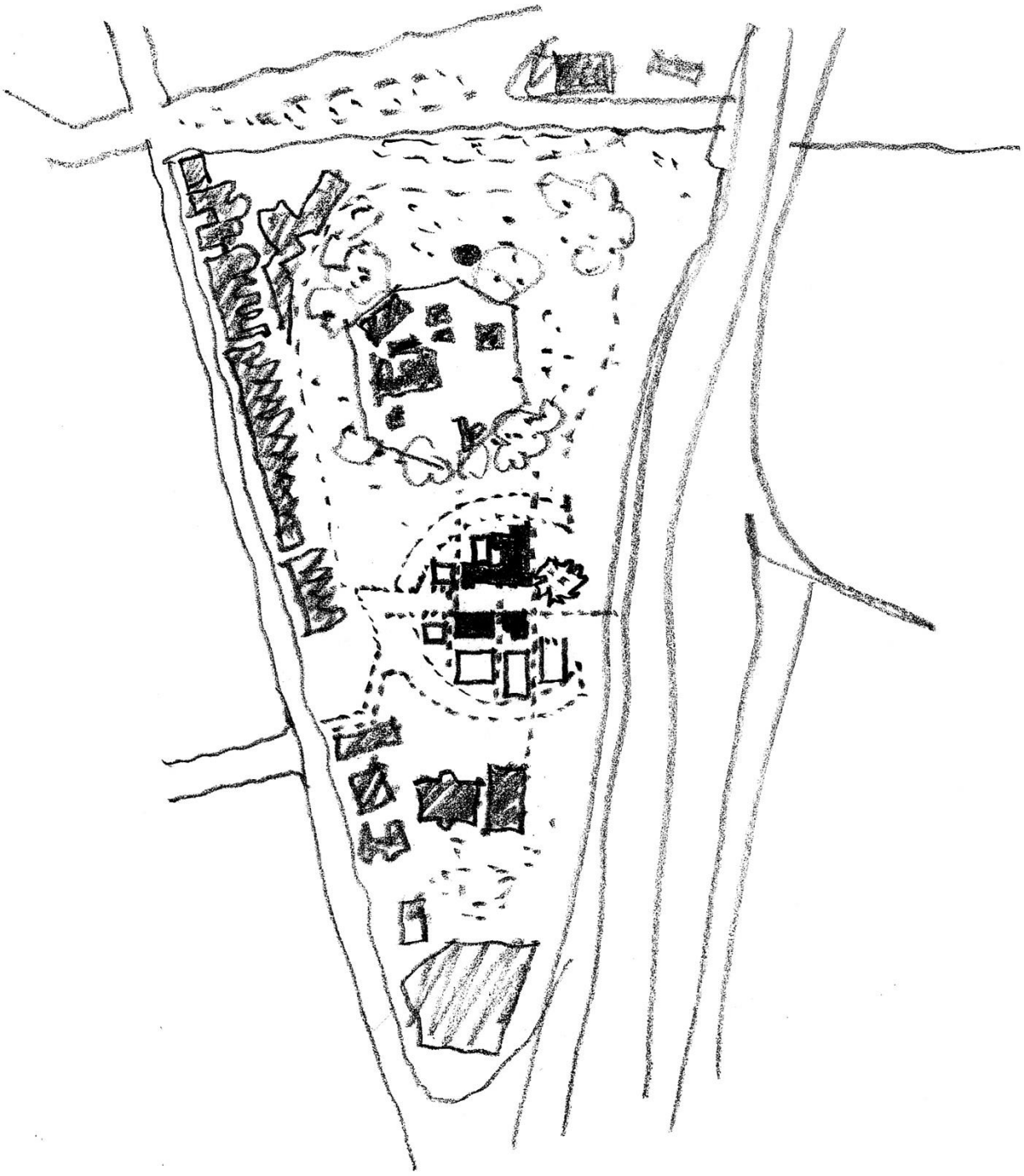
Fort Street Public School
Biodiversity Development Assessment Report

SSD 10340
Prepared by EcoLogical Australia
For School Infrastructure NSW
19 March 2020



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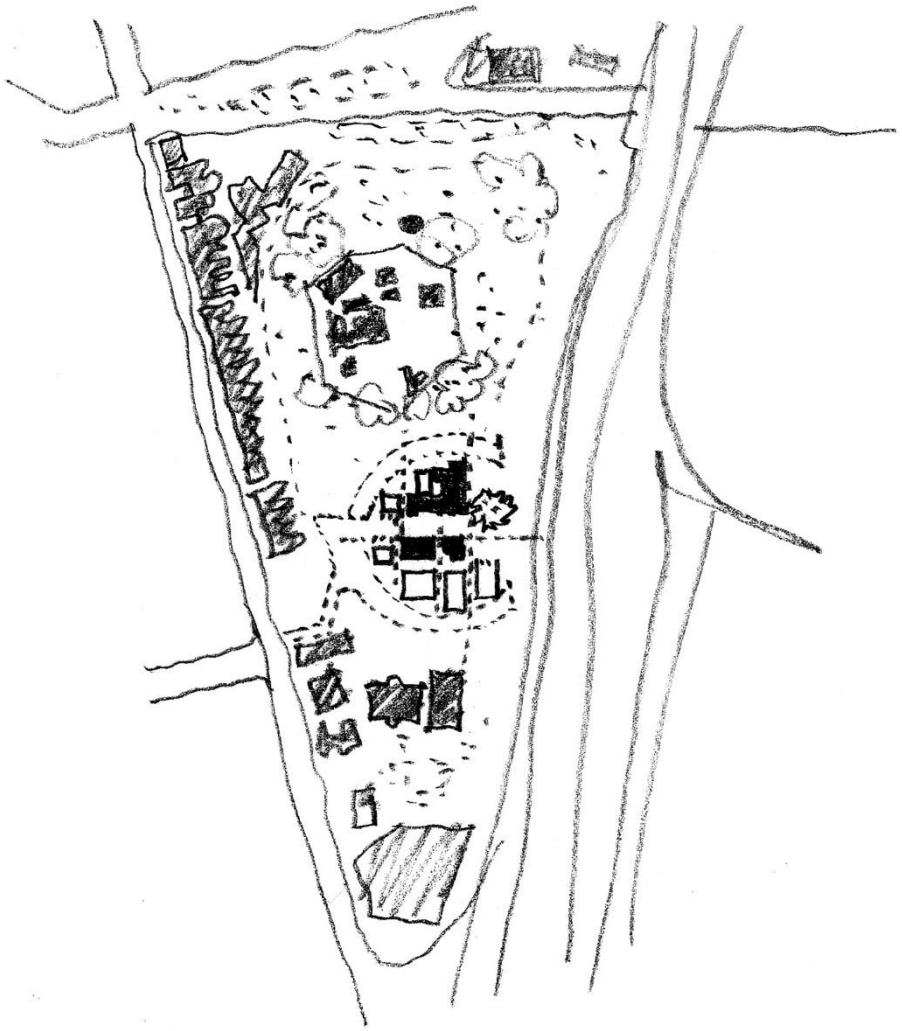

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DOCUMENT TRACKING

Project Name	Fort Street School BDAR
Project Number	14071
Project Manager	Diane Campbell
Prepared by	Diane Campbell and Carolina Mora
Reviewed by	Diane Campbell
Approved by	David Bonjer
Status	Final
Version Number	V4
Last saved on	19 March 2020

This report should be cited as 'Eco Logical Australia. Click here to enter a year. Fort Street School BDAR. Prepared for Ethos Urban.'

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd on behalf of Ethos Urban and Schools Infrastructure NSW.

Template 2.8.1

Executive Summary

Eco Logical Australia Pty Ltd was engaged by Ethos Urban to prepare a Biodiversity Development Assessment Report for the State Significant Development at Fort Street Public School (the development site) in the City of Sydney local government area. This report describes the biodiversity values of the site and outlines the measures to be taken to avoid, minimise and mitigate impacts to the vegetation and species habitat present within the development site.

This report has followed the Biodiversity Assessment Method 2017 (BAM) established under Section 6.7 of the *NSW Biodiversity Conservation Act 2016* (BC Act). This Biodiversity Development Assessment Report (BDAR) has been prepared in order to satisfy the Secretary's Environmental Assessment Requirements (SEARs) for a State Significant Development established under Section 7.9 of the *NSW Biodiversity Conservation Act 2016* (BC Act).

The proposed works involve the redevelopment of Fort Street Public School through the demolition of entire existing buildings or portions of existing buildings and the removal of some existing vegetation. The existing site will be modified to include the refurbishment or expansion of existing buildings, construction of new buildings, outdoor play areas and plantings.

The proposed development site is 0.68 ha. This is defined as the assessable area which includes the area of land defined by land title boundaries. The development site is located on land zoned as B8: Metropolitan Centre under the Sydney Local Environmental Plan 2012. The development is bound on all sides by the Cahill cut.

Native trees and ground cover species are present within part of the development site. Horticultural plantings and weeds are present throughout the development site. Vegetated areas of the development site are subject to regular mowing and garden maintenance activities. The development site also contains existing buildings that currently operate as part of Fort Street Public School and an abandoned Bureau of Meteorology building.

The proposal will result in the removal of 0.15 ha of native and exotic vegetation including one plant community type (PCT) PCT 1083 Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion and Landscaped Gardens. The PCT within the development site has been split into two vegetation zones based on the presence of two condition states. These condition states are as follows: vegetation zone 1*: PCT 1083 Garden and vegetation zone* 2: *PCT 1083 low condition*. This PCT does not form part of any threatened ecological communities under the BC Act or the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

A total of 0.09 ha of native vegetation within the development site will be directly impacted, resulting in the clearing of 0.09 ha of PCT 1083.

One threatened flora species *Syzygium paniculatum* (Magenta Lilly Pilly) identified within the development site, listed as endangered under the BC Act and vulnerable under the EPBC Act. The species has been planted and is a horticultural variety as evidenced by its attached nursery tag. The species is located outside of its normal distribution as it is known from a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest, which does not include the development site. ELA has

previously received advice from the Environment, Energy and Science group (EES) of the Department of Planning, Industry and Environment (DPIE) stating that threatened species are protected under the BC Act and require assessment of proposed impacts, regardless as to whether they are planted or not. Subsequently, this species was included as a species credit species and an impact assessment for this species was prepared under the EPBC Act.

Prescribed impacts were considered. Holes identified in the eaves of the existing Bureau of Meteorology building were considered as having the potential to be entrances to cavities suitable as roosting habitat for microchiropteran bats (microbats). Microbat scats and/or markings were not observed around any of these holes. A species polygon was prepared for these species.

The trees within the development site may be used as potential seasonal foraging habitat for microbats and *Pteropus poliocephalus* (Grey-headed Flying-fox). The nearest Nationally Important Flying-fox Camp is located 5 km away at Centennial Park. It is more likely that suitable breeding habitat would be present outside the development site in these core areas.

No other threatened flora or fauna species were recorded within the study area.

No ecosystem credits for plant community types are required for the proposed development. Species credits were required for one species credit species, *Syzygium paniculatum*. Species credits for threatened microbats assumed present were not required by the Biodiversity Assessment Method Calculator.

The following three Matters of National Environmental Significance was identified as having potential to be adversely affected by the proposed works:

- *Lathamus discolor* (Swift Parrot)
- *Pteropus poliocephalus* (Grey-headed Flying-fox)
- *Syzygium paniculatum* (Magenta Lilly Pilly).

An assessment of the Commonwealth Significant Impact Criteria was undertaken for these species and concluded that the development would not result in a significant impact to any of the potentially affected species.

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Abbreviations

Abbreviation	Description
BAM	Biodiversity Assessment Method
BAMC	Biodiversity Assessment Method Credit Calculator
BC Act	*NSW Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
CEEC	Critically Endangered Ecological Community
DoEE	Commonwealth Department of Environment and Energy
DPIE	NSW Department of Planning, Infrastructure and Environment (previously known as the Office of Environment & Heritage (OEH))
EEC	Endangered Ecological Community
EES	Environment, Energy and Science Group (part of the previous Office of Environment & Heritage (OEH))
ELA	Eco Logical Australia Pty Ltd
EP&A Act	*NSW Environmental Planning and Assessment Act 1979*
EPBC Act	*Commonwealth Environment Protection and Biodiversity Conservation Act 1999*
FM Act	*NSW Fisheries Management Act 1994*
GHFF	*Pteropus poliocephalus* (Grey-headed Flying-fox)
GIS	Geographic Information System
GPS	Global Positioning System
IBRA	Interim Biogeographic Regionalisation for Australia
LGA	Local Government Area
LLS	Local Land Service
MNES	Matters of national environmental significance
NSW	New South Wales
NOW	NSW Office of Water
OEH	NSW Office of Environment and Heritage (now known as DPIE)
PCT	Plant Community Type
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SSD	State Significant Development
TEC	Threatened Ecological Community
WM Act	*NSW Water Management Act 2000*

1. Stage 1: Biodiversity assessment

1.1 Introduction

This Biodiversity Development Assessment Report (BDAR) has been prepared in order to satisfy the Secretary's Environmental Assessment Requirements (SEARs) for a State Significant Development established under Section 7.9 of the *NSW Biodiversity Conservation Act 2016* (BC Act). This BDAR has been prepared by Diane Campbell (BAAS 17069), who is an Accredited Person under the *NSW Biodiversity Conservation Act 2016* (BC Act).

1.1.1 Description of the development

Approval is sought for the expansion of Fort Street Public School (FSPS) to accommodate a total of 600 primary school students. Specifically:

- Site preparation, demolition and excavation
  - Site remediation.
  - Demolition of the southernmost school building, the garage and storage shed west and east of the Bureau of Meteorology Building (the Met/the Met Building), and the toilet block adjoining the main school building.
  - Selective removal of various elements of the main school building, as well as minor and insignificant elements of the Met Building and the Messenger's Cottage to facilitate refurbishment and future use of these buildings.
  - Bulk excavation works to facilitate the new southern buildings and western addition to the main school building.
  - Tree removal.
  - Installation of hydraulic and electrical services.
- Land use
  - Use of all buildings for the purpose of a school.
- Existing buildings
  - Retention, refurbishment and extension of the existing FSPS, including construction of a new roof and rooftop additions.
  - Retention and refurbishment of the Met Building and internal alterations and additions.
  - Retention and minor alterations and additions to the Messenger's Cottage.
- Construction of new buildings
  - Construction of one new building on the western part of the site for a staff room.
  - Construction of two new, interconnected school buildings on the southern third of the site.
  - Construction of a new communal hall and canteen building.
- Landscaping
  - Retention of the existing large fig tree.
  - Landscaping works throughout the site, including construction of a new amphitheatre, new central plaza, and a multi-purpose forecourt.
  - Landscaping of roof gardens on top of the new southern buildings and the existing Met Building.
- Other works

- Works to the existing entrance road, including alterations to the existing Bradfield Tunnel Services Building.
- Modifications to existing pick-up/drop-off arrangements.
- Provision of signage zones.
- Installation of on-site detention.

1.1.2 General description of the development site

The proposed development site, defined as the area of land that is subject to the proposed development application, is approximately 0.68 ha. The development site comprises the grounds of FSPS, located on Observatory Hills, Millers Point, and includes the following lots:

- Lot 106 DP 748340
- Lot 107 DP 748340
- Lot 108 DP 748340
- Lot 2 DP 732592
- Lot 3 DP 732592
- Lot 4 DP 732592
- Lot 9 DP 732592
- Lot 2 DP 244444
- Lot 5 DP 258013.

The development site has been subject to considerable vegetation disturbance as a result of historical development. The development is bound on all sides by the Cahill cut. The development site comprises a number of functioning school buildings, a derelict building, a carpark, a public street, a number of listed cultural heritage items and cleared areas used by the school for outdoor play.

Remnant native trees and ground cover species are present within part of the development site. Horticultural plantings and weeds are present throughout the development site. Vegetated areas of the development site are subject to regular mowing and garden maintenance activities.

The general description of the development site is displayed on the following maps:

- Site Map (Figure 1)
- Location Map (Figure 2).

1.1.3 Development site footprint

The proposed works involve the redevelopment of Fort Street Public School through the demolition of entire existing buildings or portions of existing buildings and the removal of some existing vegetation. The existing site will be modified to include the refurbishment or expansion of existing buildings, construction of new buildings, outdoor play areas and plantings. It should be noted that this report has assumed that existing trees proposed to be removed from the development site are those identified in the Fort Street Public School Arboricultural Development Impact Assessment Report prepared by Birds Tree Consultancy (October 2019).

It is understood that the operational and construction footprint will be contained generally within the development site, with some minor works to the road around the site that are outside of the FSPS site. The BDAR has been prepared to assess the FSPS site.

1.1.4 Sources of information used

The following data sources were reviewed as part of this report:

- BioNet Vegetation Classification
- BioNet Atlas
- *Environment Protection and Biodiversity Conservation Act 1999* EPBC Act Protected Matters Search Tool 5 km database search (DotEE 2018)
- Threatened Biodiversity Data Collection
- NSW Government Biodiversity Values Map (accessed on 16 October 2019)
- The Native Vegetation of the Sydney Metropolitan Area (OEH 2016)
- Additional GIS datasets including soil, topography, geology and drainage
- FJMT Studio Landscape Concept Design Statement (September 2019)
- Fort Street Public School Arboricultural Development Impact Assessment Report prepared by Birds Tree Consultancy for School Infrastructure NSW (October 2019)
- Ethos Urban Request for Secretary's Environmental Assessment Requirements (May 2019)
- Planning Secretary's Environmental Assessment Requirements (Issued 28 June 2019)

Figure 1: Site Map

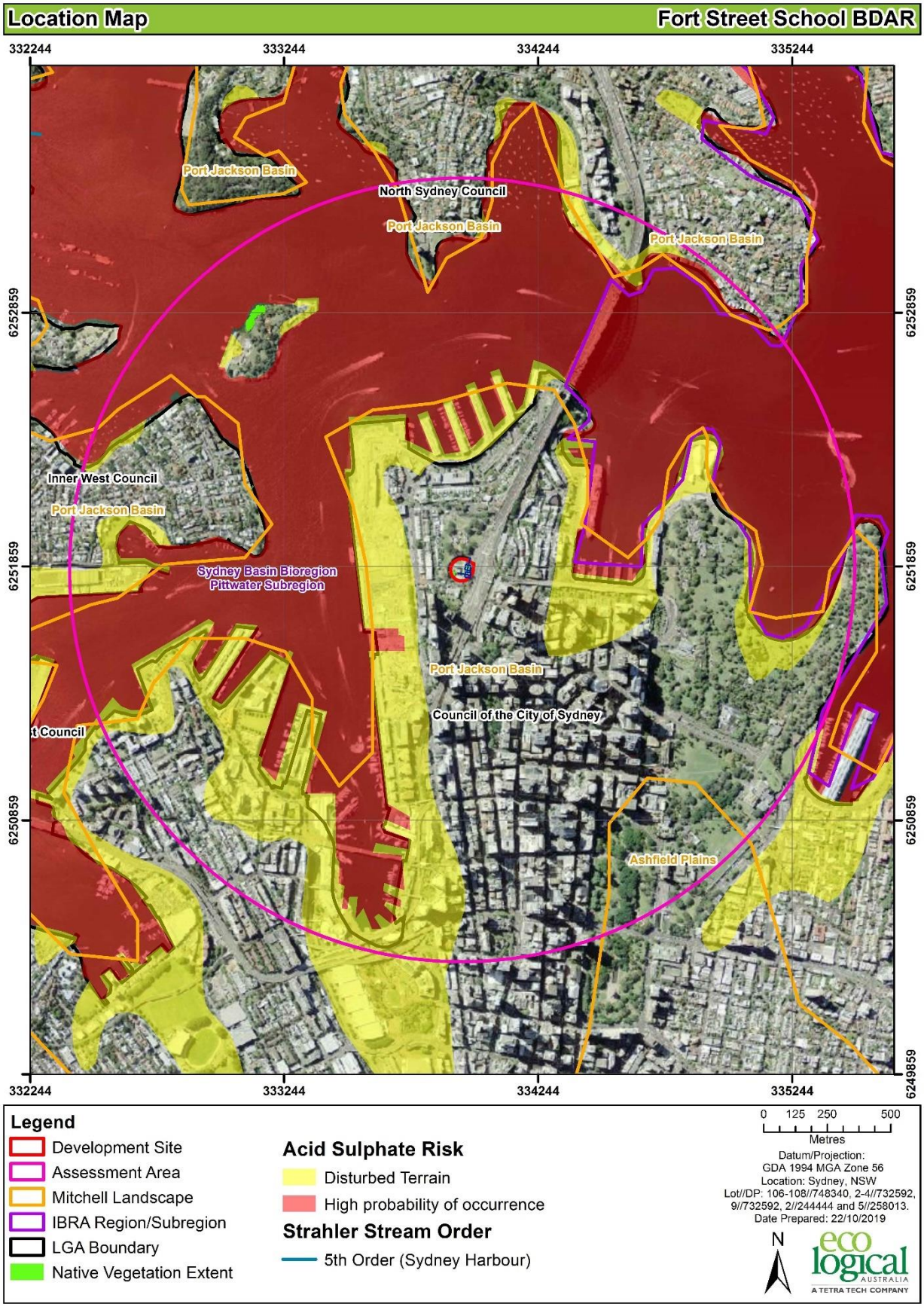

Figure 2: Location Map

1.2 Legislative context

Table 1: Legislative context

Name	Relevance to the project
Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Matters of National Environmental Significance (MNES) have been identified on or near the development site. This report assesses impacts to MNES and concludes that the development is not likely to have a significant impact on MNES.
Environmental Planning and Assessment Act 1979 (EP&A Act)	The proposed development is State Significant Development and is to be assessed under Part 4.1 of the EP&A Act. SEARs have been issued and require a Biodiversity Assessment as follows: • Biodiversity impacts related to the proposed development (SSD 10340) are to be assessed in accordance with the Biodiversity Assessment Method (BAM) and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must include information in the form detailed in the *Biodiversity Conservation Act 2016* (s6.12), *Biodiversity Conservation Regulation 2017* (s6.8) and Biodiversity Assessment Method. · • The BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the Biodiversity Assessment Method. • The BDAR must include details of the measures proposed to address the offset obligation as follows: o the total number and classes of biodiversity credits required to be retired for the development/project o the number and classes of like-for-like biodiversity credits proposed to be retired o the number and classes of biodiversity credits proposed to be retired in accordance with the variation rules o any proposal to fund a biodiversity conservation action o any proposal to make a payment to the Biodiversity Conservation Fund. o If seeking approval to use the variation rules, the BDAR must contain details of the reasonable steps that have been taken to obtain requisite like-for-like biodiversity credits. · • The BDAR must be prepared by a person accredited in accordance with the Accreditation Scheme for the Application of the Biodiversity Assessment Method Order 2017 under s6.10 of the Biodiversity Conservation Act 2016. • Where a Biodiversity Assessment Report is not required under the BC Act, engage a suitably qualified person to assess and document the flora and fauna impacts related to the proposal.
Biodiversity Conservation Act 2016 (BC Act)	As a State Significant Development, the proposed development requires submission of a Biodiversity Development Assessment Report.
Fisheries Management Act 1994 (FM Act)	The development does not involve impacts to Key Fish Habitat, does not involve harm to marine vegetation, dredging, reclamation or obstruction of fish passage. A permit or consultation under the FM Act is not required.
Local Land Services Amendment Act 2016 (LLS Act)	The LLS Act does not apply to areas of the state to which the SEPP Vegetation applies. The Vegetation SEPP applies to the City of Sydney local government area (LGA).
Water Management Act 2000 (WM Act)	The project does not involve works on waterfront land. A Controlled Activity Approval under s91 of the WM Act is not required.
Vegetation SEPP	The Vegetation SEPP applies to development that does not require consent. As this project requires consent under the EP&A Act the Vegetation SEPP is not relevant.

Name	Relevance to the project
SEPP Coastal Management	The proposed development is not located on land subject to this SEPP.
SEPP 44 – Koala Habitat Protection	The proposed development is not located within a LGA to which SEPP 44 applies.
Sydney Local Environment Plan 2012 (LEP)	The subject site is zoned B8: Metropolitan Centre under the Sydney LEP. The site is not subject to the Biodiversity or Riparian overlay under the LEP.
Sydney Development Control Plan 2012 (DCP)	The Sydney DCP contains provisions relating to vegetation in Section 3.5 – Urban Ecology. The proposed development has been assessed in accordance with the Biodiversity Assessment Method to comply with requirements under Part 4 of the EP&A Act. No further assessment under the Sydney DCP is therefore required.

1.3 Landscape features

1.3.1 IBRA regions and subregions

The development site falls within the IBRA region and subregion as outlined in Table 2 and Table 3.

Table 2: IBRA regions

IBRA region	Area within development site (ha)
Sydney Basin	0.68

Table 3: IBRA subregions

IBRA subregion	Area within development site (ha)
Pittwater	0.68

1.3.2 Mitchell Landscapes

The development site falls within the Port Jackson Basin Mitchell Landscapes (DECC 2002) as outlined in **Table 4**.

Table 4: Mitchell Landscapes

Mitchell landscape	Description	Area within Development Site (ha)
Port Jackson Basin	Deep elongated harbour with steep cliffed margins on horizontal Triassic quartz sandstone. Small pocket beaches and more extensive Quaternary estuary fill of muddy sand at the head of most tributary streams. General elevation 0 to 80m, local relief 10 to 50m. Sandstone slopes and cliffs have patches of uniform or gradational sandy soil on narrow benches and within joint crevices that support forest and woodland of *Eucalyptus piperita*, *Angophora costata*, *Corymbia gummifera* and *Eucalyptus pilularis*. Sheltered gullies contain some *Syncarpia glomulifera*, *Ceratopetalum apetalum* and *Tristaniopsis laurina*. Estuarine sands were originally dominated by saltmarsh but have been taken over by *Avicennia marina* in the past century.	0.68

1.3.3 Native vegetation extent

The extent of native vegetation within the development site and buffer is outlined in Table 5. There are no differences between the mapped vegetation extent and the aerial imagery.

Table 5: Native vegetation extent

Area within the development site (ha)	Area within the 1,500 m buffer area (ha)
0.16	0.44

1.3.4 Rivers and streams

The development site does not contain any rivers or streams.

1.3.5 Wetlands

The development site does not contain any wetlands.

1.3.6 Connectivity features

No connectivity features were identified for the development site. Patches of native and exotic vegetation are present in the Royal Botanic Gardens, Barangaroo Reserve, Blues Point Reserve and Observatory Hill Park, which are all located within 2 km of the development site. These urban reserves comprise isolated stepping stone habitat with links consisting of scattered street trees and open water.

1.3.7 Areas of geological significance and soil hazard features

The development site does not contain karst, caves, crevices, cliffs or other areas of geological significance. The development site does not contain soil hazard features.

1.3.8 Site context

1.3.8.1 Method applied

The site-based method has been applied to this development.

1.3.8.2 Percent native vegetation cover in the landscape

The current percent native vegetation cover in the landscape was assessed in a Geographic Information System (GIS) using aerial imagery sourced from Nearmap using increments of 5%. The native vegetation cover within the 1,500 m buffer area is <1% (0.44 ha).

1.3.8.3 Patch size

Patch size was calculated using available vegetation mapping for all patches of intact native vegetation on and adjoining the development site. The patch size area is 0.68 ha.

1.4 Native vegetation

1.4.1 Survey effort

Vegetation survey was undertaken within the development site by ecologists Diane Campbell and Carolina Mora on 2 October 2019. Ttwo full floristic plots were undertaken to identify Plant Community Types (PCTs) and Threatened Ecological Communities (TECs) on the development site (Table 6). A total of two vegetation integrity plots were undertaken on the development site in accordance with the BAM (Table 7). Plot locations are displayed in Figure 4.

The survey also involved vegetation mapping of the entire development site and assessment of habitat.

All field data collected at full-floristic and vegetation integrity plots is included in **Appendix B**.

Table 6: Full-floristic PCT identification plots

PCT ID	PCT Name	Number of plots surveyed
1083	Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion	2

Table 7: Vegetation integrity plots

Veg Zone	PCT ID	PCT Name	Condition	Area (ha)	Plots required	Plots surveyed
1	1083	Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion	Garden	0.07	1	1
2	1083	Red Bloodwood – scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion	Low	0.02	1	1
3	N/A	Landscaped Garden	Garden	0.05	0	0

1.4.2 Plant Community Types present

The vegetation represented within the development site contains planted native canopy, occasional shrubs and some ground cover species which are native to NSW, however these were not considered part of a remnant Plant Community Type (PCT). However, under the BAM, planted vegetation native to NSW requires consideration as to the 'best fit' PCT. This PCT is presented in Table 8 and Figure 3.

The development site also contains planted native canopy of species which were not assigned to the 'best fit' PCT as they are northern NSW species not considered locally indigenous to relevant PCTs and the development site is located significantly beyond their range. These were included within PCT 1083.

The development site does not contain any listed TECs under the BC Act or EPBC Act.

Table 8: Plant Community Types

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Area (ha)	Percent cleared
1083	Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion	Sydney Coastal Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub-formation)	0.09	17

Justification for the selection of the PCT occurring on the development site is based on a quantitative analysis of full-floristic plot data and is provided in **Table 9**. PCT 1083 was determined through analysis of mapped soil landscapes, elevation and the presence of the key diagnostic canopy species *Corymbia gummifera* (Red Bloodwood). The development site is located on ridges of coastal sandstone, a landscape position consistent with that of the PCT. The following parent and offspring PCTs were considered but discounted due to their locations and Mitchell Landscape being inconsistent with that of the development site:

- PCT 1643 – Red Bloodwood - Smooth-barked Apple - Scribbly Gum - Old Man Banksia heathy woodland on sandstone ranges of the Central Coast
- PCT 1782 – Dwarf Apple - Broad-leaved Scribbly Gum - Sydney Peppermint low open woodland on sandstone ridges with subtle enrichment in northern Sydney
- PCT 1783 – Red Bloodwood - Scribbly Gum / Old-man Banksia open forest on sandstone ridges of northern Sydney and the Central Coast
- PCT 1777 – Red Bloodwood - Scribbly Gum - Silvertop Ash open forest on sandstone ridges of the Woronora Plateau.

Table 9: PCT selection justification

PCT ID	PCT Name	Selection criteria	Species relied upon for identification of vegetation type and relative abundance
1083	Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion	IBRA region, subregion, soil landscape, landscape position and results of floristic plot analysis including the presence of positive diagnostic canopy species	Presence of *Corymbia gummifera* (Red Bloodwood)

1.4.3 Vegetation integrity assessment

A vegetation integrity assessment using the Credit Calculator (BAMC) was undertaken and the results are outlined in Table 10.

Table 10: Vegetation integrity

Veg Zone	PCT ID	Condition	Area (ha)	Composition Condition Score	Structure Condition Score	Function Condition Score	Current vegetation integrity score
1	1083	Garden	0.07	2.3	28.3	11.9	9.2
2	1083	Low	0.02	30.9	8	18.6	16.6

1.4.4 Use of local data

The use of local data is not proposed for this assessment.

Figure 3: Plant Community Types and native vegetation extent

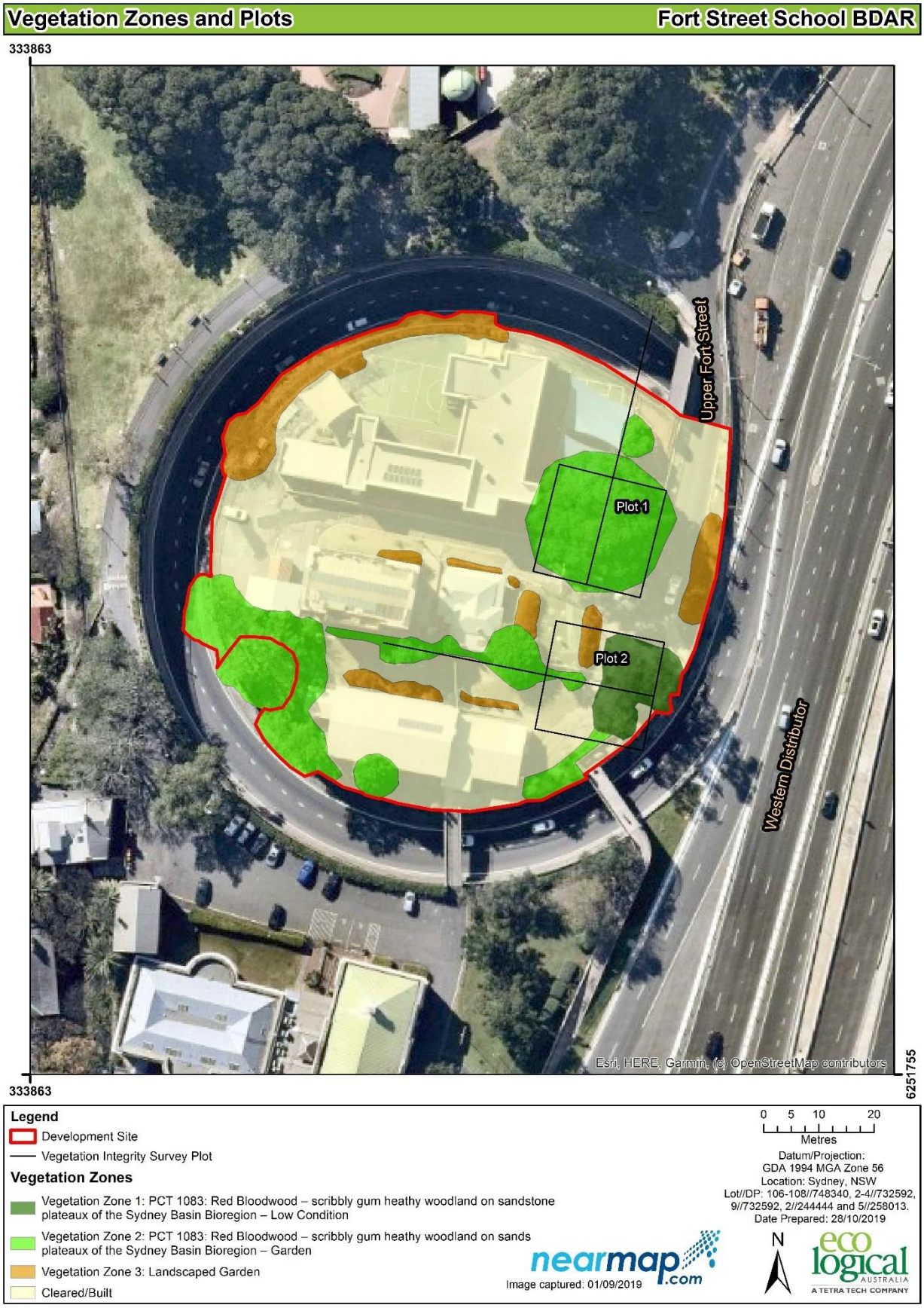

Figure 4: Plot locations

1.5 Threatened species

1.5.1 Ecosystem credit species

Ecosystem credit species predicted to occur at the development site, their associated habitat constraints, geographic limitations and sensitivity to gain class is included in Table 11. Ecosystem credit species which have been excluded from the assessment and relevant justification are also included in Table 11.

Table 11: Predicted ecosystem credit species

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
Anthochaera phrygia	Regent Honeyeater (Foraging)	N/A	High	CE	CE	Excluded Habitat features for this species are not present at this site. The development site does not comprise key plant species required for foraging.
Artamus cyanopterus cyanopterus	Dusky Woodswallow		Moderate	V	Not Listed	Excluded Habitat features for this species are not present at this site. The development site does not comprise key plant species required for foraging.
Calyptorhynchus lathami	Glossy Black-Cockatoo (Foraging)	Other Presence of *Allocasuarina* and *Casuarina* species	High	V	Not Listed	Excluded Habitat features for this species are not present at this site. The development site does not comprise key plant species required for foraging.
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	N/A	High	V	Not Listed	Excluded Habitat features for this species are not present at this site. The development site does not comprise key plant species required for foraging.
Dasyurus maculatus	Spotted-tailed Quoll	N/A	High	V	E	Excluded Habitat features for this species are not present at this site. This species requires habitat features such as maternal den sites, an abundance of food (birds and small mammals) and large areas of relatively intact vegetation to forage.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
Glossopsitta pusilla	Little Lorikeet	N/A	High	V	Not Listed	Included There are eight BioNet records for this species within a 10 km radius of the development site. This species may utilise the flowering species within the development site for seasonal foraging.
Haliaeetus leucogaster	White-bellied Sea-Eagle (Foraging)	Waterbodies Within 1 km of rivers, lakes, large dams or creeks, wetlands and coastlines	High	V	Not Listed	Included There are 31 BioNet records for this species within a 10 km radius of the development site. The development site is located within 1 km of Sydney Harbour.
Lathamus discolor	Swift Parrot (Foraging)	N/A	Moderate	E	CE	Included There are six BioNet records for this species within a 10 km radius of the development site. Foraging habitat features associated with this species were identified within the development site.
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	N/A	High	V	Not Listed	Included There are 10 BioNet records for this species within a 10 km radius of the development site. The development site contains a derelict building, a habitat feature associated with this species.
Miniopterus australis	Little Bentwing-bat (Foraging)	N/A	High	V	Not Listed	Included There are four BioNet records for this species within a 10 km radius of the development site. The development site contains a derelict building, a habitat feature associated with this species.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
Miniopterus orianae oceanensis	Large Bent-winged Bat (Foraging)	N/A	High	V	Not Listed	Included There are 71 BioNet records for this species within a 10 km radius of the development site. The development site contains a derelict building, a habitat feature associated with this species. s
Pandion cristatus	Eastern Osprey (Foraging)	N/A	Moderate	V	Not Listed	Excluded The development site is located within 1 km of Sydney Harbour, however the development site itself does not contain features associated with foraging habitat for this species.
Petroica boodang	Scarlet Robin	N/A	Moderate	V	Not Listed	Excluded Habitat features associated with this species includes an abundance of logs and fallen timber, these features were not present in the development site.
Phascolarctos cinereus	Koala (Foraging)	N/A	High	V	V	Excluded Habitat present is substantially degraded and highly fragmented such that this species is unlikely to utilise the development site. No feed trees were identified within the development site.
Pteropus poliocephalus	Grey-headed Flying-fox (Foraging)	N/A	High	V	V	Included Seasonal foraging habitat was identified in this assessment.

1.6 Species credit species

Species credit species predicted to occur at the development site (i.e. candidate species), their associated habitat constraints, geographic limitations and sensitivity to gain class is included in Table 12. Species credit species which have been excluded from the assessment and relevant justification are also included in Table 12.

Habitat assessments were undertaken during the field surveys on 2 and 9 October 2019 to determine the likelihood of threatened species occurring within the development site on an intermittent or permanent basis.

Habitat assessments involved a search for hollow-bearing trees within the development site, and a search for evidence of fauna foraging such as chewed cones, sap trees or roosting habitat in the form of white wash/pellets, plus inspection of structures to determine of suitable roosting habitat for threatened microbats. Binoculars were used when required to inspect within high branches in the tree's canopy and the eaves of structures for habitat features.

One hollow-bearing tree was identified in the *Ficus macrophylla* identified within the development site. The tree contained one small spout hollow (<100 mm) with no scratching, droppings, or other signs of use. This tree is proposed for retention. No evidence of fauna foraging was identified within the development site.

Holes identified in the eaves of the derelict Bureau of Meteorology building were considered as having the potential to be entrances to cavities suitable as roosting habitat but unlikely as breeding habitat for microchiropteran bats (microbats), hence they were considered under prescribed impacts (Section 2.1.2). Microbat scats and/or markings were not observed around any of these holes. The building is to be retained and upgraded as part of the proposed development. A species polygon was prepared for *Miniopterus australis* (Little Bent-winged Bat) and *Miniopterus orianae oceanensis* (Large Bent-winged Bat) and is provided in **Figure 5**.

The trees within the development site may be used as potential seasonal foraging habitat for microbats and *Pteropus poliocephalus* (Grey-headed Flying-fox). The nearest Nationally Important Flying-fox Camp is located 5 km away at Centennial Park. It is more likely that suitable breeding habitat would be present outside the development site in these core areas.

It should be noted that there was one flora species *Syzygium paniculatum* (Magenta Lilly Pilly) identified within the development site, listed as endangered under the BC Act and vulnerable under the EPBC Act. The species has been planted and is a horticultural variety as evidenced by its attached nursery tag. The species is located outside of its normal distribution as it is known from a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest, which does not include the development site. The individual identified on site was a recently planted 1 m high shrub and is not considered to have current biodiversity value. However, ELA has previously received advice from the Environment, Energy and Science group (EES) of DPIE stating that threatened species are protected under the BC Act and require assessment of proposed impacts, regardless as to whether they are planted or not. Subsequently, this species was included as a species credit and impact assessment for this species has been included in **Section 2.5.1**.

Table 12: Candidate species credit species

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
Acacia bynoeana	Bynoe's Wattle	N/A	High	E	V	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat is substantially degraded such that this species is unlikely to utilise the development site.
Acacia prominens – endangered population	Endangered population Gosford Wattle, Hurstville and Kogarah LGAs	N/A	Moderate	E2	Not Listed	Excluded The development site is not located within the Gosford, Hurstville or Kogarah LGAs. This species is not considered a candidate species for this assessment.
Acacia pubescens	Downy Wattle	N/A	High	V	V	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat features associated with this species are not present within the development site.
Acacia terminalis subsp. terminalis	Sunshine Wattle	N/A	Moderate	E	E	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat features associated with this species are not present within the development site.
Allocasuarina portuensis	Nielsen Park She-oak	N/A	High	E	E	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat features associated with this species are not present within the development site.
Ancistrachne maidenii	Ancistrachne maidenii	N/A	High	V	Not Listed	Excluded

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
						The presence of this species was not identified (conspicuous species) and it was determined that the habitat features associated with this species are not present within the development site.
Anthochaera phrygia	Regent Honeyeater (Breeding)	Other As per mapped areas	High	CE	CE	Excluded This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The specific habitat is not within an important breeding area for the species (National Recovery Plan).
Asterolasia elegans	Asterolasia elegans	N/A	Moderate	E	E	Excluded Habitat for this species was not considered suitable in the development site. The site is substantially degraded.
Astrotricha crassifolia	Thick-leaf Star-hair	N/A	Very High	V	V	Excluded Habitat for this species was not considered suitable in the development site. The site is substantially degraded.
Caladenia tessellata	Thick Lip Spider Orchid	N/A	Moderate	E	V	Excluded Habitat for this species was not considered suitable in the development site. The site is substantially degraded. Furthermore, this species is only known from old records in Sydney area.
Callistemon linearifolius	Netted Bottle Brush	N/A	Moderate	V	Not listed	Excluded The presence of this species was not identified (conspicuous species). The development site does not form part of the 5-6 populations remaining in the Sydney area.
Calyptorhynchus lathami	Glossy Black-Cockatoo (Breeding)	Hollow bearing trees Living or dead tree with hollows greater than 15 cm	High	V	Not Listed	Excluded This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The development site does not contain larger patches of intact

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
		diameter and greater than 5 m above ground				vegetation or trees with large hollows that are suitable for the species to utilise the site.
Camarophyllopsis kearneyi	Camarophyllopsis kearneyi	Other Creeks or drainage lines within 500 m (Semi-permanent/ephemeral wet areas) Or within 500 m (Swamps) or within 500 m (Waterbodies) Lane Cove Bushland Park	High	E	Not Listed	Excluded The development site is not in within Lane Cove Bushland Park (it is located 5 km away to the northeast of the development site). This species is unlikely to occur within the development site.
Cryptostylis hunteriana	Leafless Tongue Orchid	N/A	Moderate	V	V	Excluded Habitat for this species was not considered suitable in the development site. The site is substantially degraded.
Darwinia biflora	Darwinia biflora	N/A	High	V	V	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat features associated with this species are not present within the development site.
Darwinia glaucophylla	Darwinia glaucophylla	Rocky areas Rocky platforms or within 100 m	Moderate	V	Not Listed	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat features associated with this species are not present within the development site.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
Darwinia peduncularis	Darwinia peduncularis	Rocky areas Or within 50 m of rocky areas	High	V	Not Listed	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat features associated with this species are not present within the development site.
Diuris bracteata	Diuris bracteata	N/A	High	E	X	Excluded Habitat for this species was not considered suitable in the development site. The site is substantially degraded. The development site is not within the Gosford or Wyong Local Government areas from which populations are known.
Epacris purpurascens var. *purpurascens*	-	N/A	Moderate	V	Not Listed	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat is substantially degraded such that this species is unlikely to utilise the development site.
Eucalyptus camfieldii	Eucalyptus camfieldii	N/A	High	V	V	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat features associated with this species are not present within the development site.
Genoplesium baueri	Bauer's Midge Orchid	N/A	Moderate	E	E	Excluded Habitat for this species was not considered suitable in the development site. The site is substantially degraded. The development site is not within the 13 sites from which the species is known.
Grevillea caleyi	Caley's Grevillea	Other				Excluded

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
		Laterite soils located on ridgetops or within 100 m 8 km grid around Terrey Hills				The presence of this species was not identified (conspicuous species) and the development site does not include the habitat constraints identified for this species.
Grevillea parviflora subsp. *parviflora*	Small-flower Grevillea	N/A	High	V	V	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat features associated with this species are not present within the development site and the habitat is substantially degraded such that this species is unlikely to utilise the development site.
Grevillea parviflora subsp. *supplicans*	Grevillea parviflora subsp. supplicans	N/A	High	E	Not Listed	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat features associated with this species are not present within the development site, and the site is substantially degraded such that this species is unlikely to utilise the development site.
Haliaeetus leucogaster	White-bellied Sea-Eagle (Breeding)	Other Living or dead mature trees within suitable vegetation within 1 km of rivers, lakes, large dams or creeks, wetlands and coastlines	High	V	Not Listed	Excluded This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The development site does not contain suitable breeding habitat.
Haloragodendron lucasii	Haloragodendron lucasii	Other Seepage zone or within 100 m	High	E	E	Excluded Habitat for this species was not considered suitable in the development site.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
Hibbertia procumbens	Spreading Guinea Flower	North of Hawkesbury River	High	E	Not Listed	Excluded The presence of this species was not identified, and it was determined that the habitat features associated with this species are not present within the development site, and the site is substantially degraded such that this species is unlikely to utilise the development site. Furthermore, the development is located 45 km south of the Hawkesbury River.
Hibbertia puberula	Hibbertia puberula	N/A	High	E	Not Listed	Excluded The presence of this species was not identified, and it was determined that the habitat features associated with this species are not present within the development site. The site is substantially degraded such that this species is unlikely to utilise the development site.
Hibbertia superans	Hibbertia superans	N/A	High	E	Not Listed	Excluded The presence of this species was not identified, and it was determined that the habitat features associated with this species are not present within the development site. The site is substantially degraded such that this species is unlikely to utilise the development site.
Hygrocybe anomala var. *ianthinomarginata*	Hygrocybe anomala var. ianthinomarginata	Other Creeks or drainage lines or within 500 m (Semi-permanent/ ephemeral wet areas Or within 500 m (Swamps)	High	V	Not Listed	Excluded The development site is not in within Lane Cove Bushland Park (it is located 5 km away to the northeast of the development site). This species is unlikely to occur within the development site.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
		Or within 500 m (Waterbodies) Or within 500 m Lane Cove Bushland Reserve				
Hygrocybe aurantipes	Hygrocybe aurantipes	Other Creeks or drainage lines or within 500 m (Semi-permanent/ ephemeral wet areas Or within 500 m (Swamps) Or within 500 m (Waterbodies) Or within 500 m Lane Cove Bushland Reserve	High	V	Not Listed	Excluded The development site is not in within Lane Cove Bushland Park (it is located 5 km away to the northeast of the development site). This species is unlikely to occur within the development site.
Hygrocybe austropratensis	Hygrocybe austropratensis	Other Creeks or drainage lines or within 500 m (Semi-permanent/ ephemeral wet areas Or within 500 m (Swamps) Or within 500 m (Waterbodies) Or within 500 m	High	E	Not Listed	Excluded The development site is not in within Lane Cove Bushland Park (it is located 5 km away to the northeast of the development site). This species is unlikely to occur within the development site.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
		Lane Cove Bushland Reserve				
Hygrocybe collucera	Hygrocybe collucera	Other Creeks or drainage lines or within 500 m (Semi-permanent/ephemeral wet areas) Or within 500 m (Swamps) Or within 500 m (Waterbodies) Or within 500 m Lane Cove Bushland Reserve	High	E	Not Listed	Excluded The development site is not in within Lane Cove Bushland Park (it is located 5 km away to the northeast of the development site). This species is unlikely to occur within the development site.
Hygrocybe griseoramosa	Hygrocybe griseoramosa	Other Creeks or drainage lines or within 500 m (Semi-permanent/ephemeral wet areas) Or within 500 m (Swamps) Or within 500 m (Waterbodies) Or within 500 m Lane Cove Bushland Reserve	High	E	Not Listed	Excluded The development site is not in within Lane Cove Bushland Park (it is located 5 km away to the northeast of the development site). This species is unlikely to occur within the development site.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
Hygrocybe lanecovensis	Hygrocybe lanecovensis	Other Creeks or drainage lines or within 500 m (Semi-permanent/ephemeral wet areas) Or within 500 m (Swamps) Or within 500 m (Waterbodies) Or within 500 m Lane Cove Bushland Reserve	High	E	Not Listed	Excluded The development site is not in within Lane Cove Bushland Park (it is located 5 km away to the northeast of the development site). This species is unlikely to occur within the development site.
Hygrocybe reesiae	Hygrocybe reesiae	Other Creeks or drainage lines or within 500 m (Semi-permanent/ephemeral wet areas) Or within 500 m (Swamps) Or within 500 m (Waterbodies) Or within 500 m Lane Cove Bushland Reserve	High	V	Not Listed	Excluded The development site is not in within Lane Cove Bushland Park (it is located 5 km away to the northeast of the development site). This species is unlikely to occur within the development site.
Hygrocybe rubronivea	Hygrocybe rubronivea	Other Creeks or drainage lines or within 500	High	V	Not Listed	Excluded The development site is not in within Lane Cove Bushland Park (it is located 5 km away to the northeast of the development

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
		m (Semi-permanent/ephemeral wet areas) Or within 500 m (Swamps) Or within 500 m (Waterbodies) Or within 500 m Lane Cove Bushland Reserve				site). This species is unlikely to occur within the development site.
Kunzea rupestris	Kunzea rupestris	Rocky areas Hawkesbury sandstone rock platforms or within 50 m	High	V	V	Excluded The presence of this species was not identified, and it was determined that the habitat features associated with this species are not present within the development site. The site is substantially degraded such that this species is unlikely to utilise the development site.
Lasiopetalum joyceae	Lasiopetalum joyceae	N/A	Moderate	V	V	Excluded The presence of this species was not identified, and it was determined that the habitat features associated with this species are not present within the development site. The site is substantially degraded such that this species is unlikely to utilise the development site.
Lathamus discolor	Swift Parrot (Breeding)	Other As per mapped areas	Moderate	E	CE	Excluded There are six BioNet records for this species within a 10 km radius of the development site. Marginal seasonal foraging habitat features associated with this species were identified within the development site and this has therefore been included as an ecosystem credit species only.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
Litoria aurea	Green and Golden Bell Frog	Semi-permanent/ephemeral wet areas Within 1km of wet areas (Swamps) Within 1km of swamp (Waterbodies) Within 1km of waterbody	High	E	V	Excluded Habitat features associated with this species are not present on the development site. The development site is located within 1 km of Sydney Harbour, however there are no suitable pools, swamps or fringing vegetation within the development site which may contain suitable habitat for this species.
Melaleuca deanei	Deane's Paperbark	N/A	High	V	V	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat features associated with this species are not present within the development site.
Melaleuca groveana	Grove's Paperbark	N/A	High	V	Not Listed	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat features associated with this species are not present within the development site.
Micromyrtus blakelyi	Micromyrtus blakelyi	Other Skeletal soil (Rocky areas) Hawkesbury sandstone rock platforms and outcrops or within 50 m	Moderate	V	V	Excluded The presence of this species was not identified, and it was determined that the habitat features associated with this species are not present within the development site. The site is substantially degraded such that this species is unlikely to utilise the development site.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
Miniopterus australis	Little Bent-winged Bat (Breeding)	Caves Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records in BioNet with microhabitat code 'IC – in cave' Observation type code 'E nest-roost' With numbers of individuals >500 Or from the scientific literature	Very High	V	Not Listed	Excluded This is a dual credit species and its foraging habitat is included under ecosystem credits. The development site contains a derelict building, which may provide roosting habitat but is unlikely to provide breeding habitat for this species. The species profile indicates that *Miniopterus australis* sometimes roost in buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats, with only five nursery sites /maternity colonies are known in Australia. The species has also been considered under prescribed impacts Section 2.1.2.
Miniopterus orianae oceanensis	Large Bent-winged Bat (Breeding)	Caves Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records in BioNet with microhabitat code 'IC – in cave' Observation type code 'E nest-roost' With numbers of individuals >500	Very High	V	Not Listed	Included This is a dual credit species and its foraging habitat is included under ecosystem credits. The development site contains a derelict building, which may provide roosting habitat but is unlikely to provide breeding habitat for this species. The species has also been considered under prescribed impacts Section 2.1.2.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
Myotis macropus	Southern Myotis	Hollow bearing trees Within 200 m of riparian zone (Other) Bridges, caves or artificial structures within 200 m of riparian zone (Waterbodies) This includes rivers, creeks, billabongs, lagoons, dams and other waterbodies on or within 200 m of the site	High	V	Not Listed	Excluded This is a dual credit species. The site is located over 200 m from the nearest water body (Sydney Harbour).
Pandion cristatus	Eastern Osprey (Breeding)	Other Presence of stick-nests in living and dead trees (>15 m) or artificial structures within 100 m of a floodplain for nesting)	Moderate	V	Not Listed	Excluded This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The development site does not contain suitable breeding habitat.
Perameles nasuta - endangered population	Long-nosed Bandicoot, North Head	South of Addison Rd Manly Headland, including Sydney Harbour NP (north)	High	E	Not Listed	Excluded The development site is not in within North Head (it is located 9 km away to the northeast of the development site, across Sydney Harbour). This species is unlikely to occur within the development site.
Persoonia hirsuta	Hairy Geebung	N/A	High	E	E	Excluded

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
						The presence of this species was not identified, and it was determined that the habitat is substantially degraded such that this species is unlikely to utilise the development site.
Persoonia mollis subsp. *maxima*	Persoonia mollis subsp. maxima	N/A	High	E	E	Excluded The presence of this species was not identified, and it was determined that the habitat is substantially degraded such that this species is unlikely to utilise the development site.
Petaurus norfolcensis	Squirrel Glider	N/A	High	V	Not Listed	Excluded Habitat present is substantially degraded such that this species is unlikely to utilise the development site. Habitat in the development site is isolated and disturbed with a higher likelihood of this species more suitable habitat within the locality. Additionally, this species has a strong preference for old growth forests which does not include the development site.
Phascolarctos cinereus	Koala (Breeding)	Other Areas identified via survey as important habitat	High	V	V	Excluded This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. Habitat present is considered unsuitable and substantially degraded such that this species is highly unlikely to utilise the site for breeding.
Pimelea curviflora var. *curviflora*	Pimelea curviflora var. curviflora	N/A	High	V	V	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat is substantially degraded such that this species is unlikely to utilise the development site.
Prostanthera junonis	Somersby Mintbush	N/A	High	E	E	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat is substantially

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
						degraded such that this species is unlikely to utilise the development site. The development site is not located within the Gosford or Wyong local government areas from which this species is known.
Prostanthera marifolia	Seaforth Mintbush	N/A	High	CE	CE	Excluded The presence of this species was not identified (conspicuous species) and it was determined that the habitat is substantially degraded such that this species is unlikely to utilise the development site. The development site is not located within the Northern Beaches local government area from which this species is known.
Pteropus poliocephalus	Grey-headed Flying-fox (Breeding)	Other Breeding camps	High	V	V	Excluded This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The development site does not contain any breeding sites that are suitable for the species to utilise. The nearest Nationally Important Flying-fox Camp is located 5 km away at Centennial Park.
Pterostylis sp. *Botany Bay*	Botany Bay Bearded Orchid	N/A	High	E	E	Excluded Habitat for this species was not considered suitable in the development site. The site is substantially degraded. The development site is not within the Botany bay National Park from which the species is known.
Syzygium paniculatum	Magenta Lilly Pilly	N/A	High	E	V	Included This species was identified within the development site.
Tetratheca glandulosa	Tetratheca glandulosa	N/A	High	V	Not Listed	Excluded Habitat for this species was not considered suitable in the development site. The site is substantially degraded.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
Turnix maculosus	Red-backed Button-quail	N/A	High			Excluded The development site does not contain suitable habitat for this species.

1.6.1 Targeted surveys

Due to the high level of modification of vegetation within the development site and lack of potential habitat, targeted surveys were not conducted for species credit species. Justification for the exclusion of species credit species is provided above in Table 12.

Some microbat species are dual credit species with only breeding habitat considered for species credits. None of the dual credit species are known to breed in man-made structures such as roof cavities. However, under Section 9.2.1 of the BAM, the accessor must take into consideration Prescribed Biodiversity Impacts including any man-made structures which may be roosting habitat for the following threatened microbat species:

- *Miniopterus australis* (Little Bentwing-bat)
- *Miniopterus orianae oceanensis* (Large Bent-winged Bat).

This is further outlined in the Prescribed Biodiversity Impact Assessment **Section 2.1.2**.

1.6.2 Expert reports

Expert reports have not been prepared as part of this BDAR.

Figure 5: Species polygon (habitat) for *Miniopterus australis* and *Miniopterus orianae oceanensis*

2. Stage 2: Impact assessment (biodiversity values)

2.1 Avoiding impacts

2.1.1 Locating and designing a project to avoid and minimise impacts on vegetation and habitat

The proposed development will result in the removal of some planted and remnant native vegetation. However, the proposed development plans to retain a dominant canopy tree and two other native trees. Other trees and planted vegetation proposed for removal is in poor condition or within the development footprint. Furthermore, the site is located in an urban area which avoids and minimises impacts to better quality vegetation and more important habitat in the locality, as outlined in Table 13.

Table 13: Locating a project to avoid and minimise impacts on vegetation and habitat

Approach	How addressed	Justification
Locating and designing the project in areas where there are no biodiversity values	Biodiversity values within the proposed development site will be partially protected.	The biodiversity values present within the development site include remnant canopy species within vegetation mapped as PCT 1083 and planted native trees. The proposed development will result in the removal of a number of native trees, however the planted *Ficus macrophylla* – which represents suitable foraging habitat for various threatened species will be protected.
Locating and designing the project in areas where the native vegetation or threatened species habitat is in the poorest condition	The project has been designed and located within areas of disturbed planted vegetation and cleared or built land.	The project has been generally located to utilise existing disturbed or previously developed areas. The majority of the native vegetation within the development site proposed to be removed has been planted. There are no indigenous threatened flora species recorded within the development site. There is no important habitat for threatened fauna species within the development site.
Locating and designing the project in areas that avoid habitat for species and vegetation in high threat categories (e.g. an EEC or CEEC), indicated by the biodiversity risk weighting for a species	The project has been designed and located within areas of disturbed planted vegetation.	The development site does not contain vegetation that comprises important habitat for threatened species or vegetation in high threat categories.
Locating and designing the project such that connectivity enabling movement of species and genetic material between areas of adjacent or nearby habitat is maintained	The project is located in a highly fragmented urban landscape, some connectivity for highly mobile species will be retained in the landscape under the project design.	Three native trees will be retained to provide connectivity for highly mobile species. The project design includes planting trees throughout the development site, thus contributing to connectivity for highly mobile species.

2.1.2 Prescribed biodiversity impacts

The development site has the prescribed biodiversity impacts as outlined in **Table 14**.

The list of potential prescribed biodiversity impacts as per the BAM is provided below:

- Occurrences of karst, caves, crevices and cliffs - none occur within the development site
- Occurrences of rock - no rock outcrops or scattered rocks occur within the development site
- Occurrences of human made structures and non-native vegetation – **Yes, see section below**.
- Hydrological processes that sustain and interact with the rivers, streams and wetlands - none occur within the development site
- Proposed development for a wind farm and use by species as a flyway or migration route - the project does not involve any wind farm development.

The development site contains both human-made structures and non-native vegetation. Additional information regarding consideration of human made structures is provided below. Non-native vegetation was identified and assessed for any potential to provide habitat for threatened flora and fauna species, including presence of hollow bearing trees.

A literature review was conducted to identify if buildings or structures could potentially be utilised as a roosting resource by microbats, including BioNet records within the development site and surrounding landscape. Visual surveys were conducted to visually determine if the buildings within the development site contain potential openings, possibly utilised by microbats. Possible threatened microbats include:

- *Miniopterus australis* (Little Bentwing-bat)
- *Miniopterus orianae oceanensis* (Large Bent-winged Bat).

Holes identified in the eaves of the existing Bureau of Meteorology building were considered as having the potential to be entrances to cavities with potential for roosting habitat for microchiropteran bats (microbats). Microbat scats and/or markings were not observed around any of these holes.

The building is to be retained and upgraded as part of the proposed development. A species polygon was prepared for *Miniopterus australis* (Little Bent-winged Bat) and *Miniopterus orianae oceanensis* (Large Bent-winged Bat) and is provided in **Figure 5**.

Table 14: Prescribed biodiversity impacts

Prescribed biodiversity impact	Description in relation to the development site	Threatened species or ecological communities affected
Impacts of development on the habitat of threatened species or ecological communities associated with: • karst, caves, crevices, cliffs and other geological features of significance, or • rocks, or • human made structures, or • non-native vegetation	The development site contains a derelict building which has holes in the eaves.	Potential foraging habitat for threatened microbats: • *Miniopterus australis* (Little Bentwing-bat) • *Miniopterus orianae oceanensis* (Large Bent-winged Bat).

Prescribed biodiversity impact	Description in relation to the development site	Threatened species or ecological communities affected
Impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	The development will result in a temporary, minor reduction in the extent of existing non-native and native vegetation within the development site which provides stepping stone habitat between urban fragmented patches of vegetation.	Temporary reduction in extent of foraging habitat for threatened microbats.
Impacts of development on movement of threatened species that maintains their lifecycle	The proposed development will result in the temporary reduction of vegetation within the development site and temporary, marginal loss of connectivity for highly mobile threatened species.	Threatened microbat species.

2.1.2.1 Locating and designing a project to avoid and minimise prescribed biodiversity impacts

The development has been located and designed in a way which avoids and minimises prescribed biodiversity impacts as outlined in Table 15.

Table 15: Locating a project to avoid and minimise prescribed biodiversity impacts

Approach	How addressed	Justification
Locating and designing the development to avoid direct impacts on the non-native vegetation and human made structures	The biodiversity values present within the development site will not be protected except for the existing *Ficus macrophylla*, *Eucalyptus piperita* and *Eucalyptus saligna*. Although this is a highly modified site, planted native and non-native canopy is located within the development site and the majority of this will be removed for the development.	The project design has utilised the majority of the site for construction works and will retain three planted native trees. Areas impacted within the development site include non-native and native vegetation, and existing buildings. The vegetation in the development site is in a disturbed and fragmented condition and does not represent important habitat for species.
Locating and designing the development to avoid severing or interfering with corridors connecting different areas of habitat, migratory flight paths to important habitat or preferred local movement pathways	The development site is isolated by the Cahill Cut, a major on-ramp onto the Cahill Expressway. This location limits migratory / foraging connectivity and exchange of genetic material between patches of native vegetation.	As above, in the context of the surrounding locality, it is considered that vegetation is in a disturbed condition and already highly fragmented. Thus, the project design is considered to be located in an area where exchange of genetic material between adjacent or nearby habitat is already limited.
Optimising project layout to minimise interactions with threatened and protected species and ecological communities, e.g. designing turbine layout to allow buffers around features that attract and support aerial species, such as forest edges, riparian corridors and wetlands, ridgetops and gullies	The development design has utilised areas with minimal impacts to biodiversity values.	The development design has utilised existing disturbed areas, thus minimising interactions with threatened species habitat.

2.2 Assessment of Impacts

2.2.1 Direct impacts

The direct impacts of the development on:

- Native vegetation is outlined in Table 16
- Threatened species and threatened species habitat is outlined in Table 17
- Prescribed biodiversity impacts are outlined in **Section 2.2.2**

Direct impacts including the final project footprint (construction and operation) are shown on **Figure 6**.

Table 16: Direct impacts to native vegetation

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)
1083	Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion	Sydney Coastal Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub-formation)	0.09

Table 17: Direct impacts on threatened species and threatened species habitat

Species	Common Name	Direct impact number of individuals / habitat (ha)	NSW listing status	EPBC Listing status
Syzygium paniculatum	Magenta Lilly Pilly	1	Endangered	Vulnerable

2.2.2 Change in vegetation integrity

The change in vegetation integrity as a result of the development is outlined in Table 18**.**

Table 18: Change in vegetation integrity

Veg Zone	PCT ID	Condition	Area (ha)	Current vegetation integrity score	Future vegetation integrity score	Change in vegetation integrity
1	1083	Garden	0.07	9.2	0	-9.2
2	1083	Low	0.02	16.6	0	-16.6

2.2.3 Indirect impacts

The indirect impacts of the development are outlined in Table 19.

Table 19: Indirect impacts

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
Sedimentation and contaminated and/or nutrient rich run-off	Construction	Runoff during construction works	Confined to development site with	During heavy rainfall or storm events	During rainfall events	Short-term impacts

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
			sediment fencing			
Noise, dust or light spill	Construction	Noise and dust created from machinery (no night works proposed therefore no light spill)	Noise and dust likely to carry beyond development site boundary	Daily, during construction works	Sporadic throughout construction period	Short-term impacts
Inadvertent impacts on adjacent habitat or vegetation	Construction	Damage to adjacent habitat or vegetation	Adjacent vegetation	Daily, during construction works	Throughout construction period	Short-term impacts
Transport of weeds and pathogens from the site to adjacent vegetation	Construction	Spread of weed seed or pathogens	Potential for spread into adjacent habitat	Daily, during construction works	Sporadic throughout construction period	Potentially long-term impacts
Vehicle strike	Construction / operation	Potential for native fauna to be struck by working machinery and moving vehicles	Within access road and development site	Daily, during both construction and operational phases.	Throughout life of project	Short-term impacts
Trampling of threatened flora species	Construction / operation	No threatened flora species present	N/A	N/A	N/A	N/A

2.2.4 Mitigating and managing impacts

Measures proposed to mitigate and manage impacts at the development site before, during and after construction are outlined in Table 20.

Table 20: Measures proposed to mitigate and manage impacts

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Displacement of resident fauna	Minor	Negligible	Pre-clearance survey of the derelict building prior to patching of the holes that represent potential roosting habitat for threatened species.	Resident fauna relocated in a sensitive manner.	Prior to restoration of the derelict BOM building.	Project Manager / Ecologist
Prepare a microbat management plan that investigates options for relocation using best practice techniques or installing artificial habitats for fauna in adjacent retained vegetation and habitat or human made structures to replace the habitat resources lost and encourage animals to move from the impacted site, e.g. nest boxes	Minor	Negligible	If microbats are observed during the pre-clearance survey of the building, a microbat management plan will be prepared. It is unlikely that microbats will be present as there is currently no evidence of their occupation and they have been included as a precautionary measure. A microbat management plan will investigate options for relocation using best practice techniques as well as nest box installation on-site or off-site. If pre-clearing identifies no microbats, then the building can be upgraded without any further measures.	Relocation of microbats or replacement of habitat features removed	Prior to and during clearing works	Project Manager/ Ecologist
Sediment barriers or sedimentation ponds to control the quality of water released from the site into the receiving environment	Moderate	Minor	Appropriate controls are to be utilised to manage exposed soil surfaces and stockpiles to prevent sediment discharge into waterways. Soil and erosion measures such as sediment fencing, clean water diversion must be in place prior the commencement of the construction work.	Erosion and sedimentation will be controlled	For the duration of construction works	Project Manager
Preparing a microbat management plan that investigates options for relocation using best practice	Minor	Negligible	If microbats are observed during the pre-clearance survey of the building, a microbat management plan will be	Impacts to fauna during nesting/nursing avoided	Prior to and during clearing works	Project Manager

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
techniques, as well as programming construction activities to avoid impacts; for example, timing construction activities for when migratory species are absent from the site, or when particular species known to or likely to use the habitat on the site are not breeding or nesting			prepared that investigates options for relocation using best practice techniques, as well as timing of construction works outside of the winter/spring breeding season. If pre-clearing identifies no microbats, then the building can be upgraded without any further measures.			
Hygiene protocols to prevent the spread of weeds or pathogens between infected areas and uninfected areas	Moderate	Minor	Vehicles, machinery should be cleaned of soil prior to entry into the development site as external soil may contain pathogens or disease. Weed management to be undertaken where required.	Spread of weeds prevented	Post-construction	Project Manager
Staff training and site briefing to communicate environmental features to be protected and measures to be implemented	Minor	Negligible	Construction staff to be briefed prior to work commencing to be made aware of any sensitive biodiversity values present and environmental procedures such as: • Site environmental procedures (vegetation management, sediment and erosion control, exclusion fencing and weeds) • What to do in case of environmental emergency (chemical spills, fire, injured fauna) Key contacts in case of environmental emergency	All staff entering the development site are fully aware of all the ecological values present within the Lot and environmental aspects relating to the development and know what to do in case of any environmental emergencies	To occur for all staff entering/working at the development site. Site briefings should be updated based on phase of the work and when environmental issues become apparent.	Project Manager

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Making provision for the ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on or adjacent to the development site	Minor	Negligible	Landscaping in the development site is to use locality derived native species and those found within the PCTs present.	Areas within the development site will be landscaped using appropriate species	Throughout construction and following completion of construction activities.	Project Manager

Figure 6: Final project footprint including construction and operation

2.3 Risk assessment

A risk assessment has been undertaken for any residual impacts likely to remain after the mitigation measures have been applied. Likelihood criteria, consequence criteria and the risk matrix are provided in Table 21, Table 22, Table 23 and Table 24 respectively.

Table 21: Likelihood criteria

Likelihood criteria	Description
Almost certain (Common)	Will occur, or is of a continuous nature, or the likelihood is unknown. There is likely to be an event at least once a year or greater (up to ten times per year). It often occurs in similar environments. The event is expected to occur in most circumstances.
Likely (Has occurred in recent history)	There is likely to be an event on average every one to five years. Likely to have been a similar incident occurring in similar environments. The event will probably occur in most circumstances.
Possible (Could happen, has occurred in the past, but not common)	The event could occur. There is likely to be an event on average every five to twenty years.
Unlikely (Not likely or uncommon)	The event could occur but is not expected. A rare occurrence (once per one hundred years).
Remote (Rare or practically impossible)	The event may occur only in exceptional circumstances. Very rare occurrence (once per one thousand years). Unlikely that it has occurred elsewhere; and, if it has occurred, it is regarded as unique.

Table 22: Consequence criteria

Consequence category	Description
Critical (Severe, widespread long-term effect)	Destruction of sensitive environmental features. Severe impact on ecosystem. Impacts are irreversible and/or widespread. Regulatory and high-level government intervention/action. Community outrage expected. Prosecution likely.
Major (Wider spread, moderate to long term effect)	Long-term impact of regional significance on sensitive environmental features (e.g. wetlands). Likely to result in regulatory intervention/action. Environmental harm either temporary or permanent, requiring immediate attention. Community outrage possible. Prosecution possible.
Moderate (Localised, short-term to moderate effect)	Short term impact on sensitive environmental features. Triggers regulatory investigation. Significant changes that may be rehabilitated with difficulty. Repeated public concern.
Minor (Localised short-term effect)	Impact on fauna, flora and/or habitat but no negative effects on ecosystem. Easily rehabilitated. Requires immediate regulator notification.
Negligible (Minimal impact or no lasting effect)	Negligible impact on fauna/flora, habitat, aquatic ecosystem or water resources. Impacts are local, temporary and reversible. Incident reporting according to routine protocols.

Table 23: Risk matrix

Consequence	Likelihood				
	Almost certain	Likely	Possible	Unlikely	Remote
Critical	Very High	Very High	High	High	Medium
Major	Very High	High	High	Medium	Medium
Moderate	High	Medium	Medium	Medium	Low
Minor	Medium	Medium	Low	Low	Very Low
Negligible	Medium	Low	Low	Very Low	Very Low

Table 24: Risk assessment

Potential impact	Project phase	Risk (pre-mitigation)	Risk (post mitigation)
Vegetation clearing	Construction / operation	Low	Very Low
Sedimentation and contaminated and/or nutrient rich run-off	Construction	Medium	Low
Noise, dust or light spill	Construction	Low	Very Low
Inadvertent impacts on adjacent habitat or vegetation	Construction	Low	Very Low
Transport of weeds and pathogens from the site to adjacent vegetation	Construction	Medium	Low
Vehicle strike	Construction / operation	Low	Very Low
Trampling of threatened flora species	Construction / operation	Low	Very Low
Rubbish dumping	Construction / operation	Low	Very Low
Wood collection	Construction / operation	Low	Very Low
Bush rock removal and disturbance	Construction / operation	Low	Very Low
Increase in predatory species populations	Construction / operation	Medium	Low
Increase in pest animal populations	Construction / operation	Low	Very Low
Increased risk of fire	Construction / operation	Low	Very Low
Disturbance to specialist breeding and foraging	Construction / operation	Low	Very Low

Potential impact	Project phase	Risk (pre-mitigation)	Risk (post mitigation)
habitat, e.g. beach nesting for shorebirds.			
Sedimentation and contaminated and/or nutrient rich run-off	Construction	Medium	Low

2.4 Impact summary

Following implementation of the BAM and the BAMC, the following impacts have been determined.

2.4.1 Serious and Irreversible Impacts (SAII)

The development does not have any Serious and Irreversible Impacts (SAII).

2.4.2 Impacts requiring offsets

The impacts of the development to native vegetation do not require any offsets.

2.4.3 Impacts not requiring offsets

The impacts of the development not requiring offset for native vegetation are outlined in Table 25. The impacts of the development not requiring offset for threatened species and threatened species habitat is outlined in Table 26.

Table 25: Impacts to native vegetation that do not require offsets

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)	Rationale
1083_Garden	Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion (Garden)	Sydney Coastal Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub-formation)	0.07	The vegetation integrity score of 11.9 was below the vegetation integrity score of 20 where the PCT is not representative of a TEC or associated with threatened species habitat, therefore no offsets are required.
1083_Low	Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion (Low Conditon)	Sydney Coastal Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub-formation)	0.02	The vegetation integrity score of 16.6 was below the vegetation integrity score of 20 where the PCT is not representative of a TEC or associated with threatened species habitat, therefore no offsets are required.

Table 26: Impacts on threatened species and threatened species habitat that do not require offsets

Species	Common Name	Direct impact number of individuals / habitat (ha)	NSW listing status	EPBC Listing status	Rationale
Miniopterus australis	Little Bent-winged Bat	0.09	Vulnerable	Not Listed	Although it is unlikely that the derelict building (prescribed impact) is breeding habitat and it may be roosting habitat, no offset credits are required under the BAM Calculator.

Species	Common Name	Direct impact number of individuals / habitat (ha)	NSW listing status	EPBC Listing status	Rationale
Miniopterus orianae oceanensis	Large Bent-winged Bat	0.09	Vulnerable	Not Listed	Although it is unlikely that the derelict building (prescribed impact) is breeding habitat and it may be roosting habitat, no offset credits are required under the BAM Calculator

2.4.4 Areas not requiring assessment

Areas not requiring assessment include existing buildings, carparks, paths, and exotic gardens. The development site contains cleared/built areas and landscaped gardens (0.51 ha) as shown in **Figure 3**. These areas were not consistent with any listed PCT, nor did they contain any threatened species. An assessment of Prescribed Impacts has been undertaken, hence further assessment under the BAM was not required. Areas not requiring assessment are shown on Figure 7.

2.4.5 Credit summary

No ecosystem credits for plant community types are required for the proposed development.

Species credits were required for one species credit species, impacted by the development, are outlined in Table 27. A total of two species credit species are required for impacts to *Syzygium paniculatum*. The species credit polygons have been determined as the PCTs impacted within 2 km of the habitat feature identified in accordance with the BAM and as detailed in the Threatened Biodiversity Data Collection: *cliffs within 2 km of rocky areas containing caves, overhangs, escarpment, outcrops, or crevices, or within 2 km of old mines or tunnels*. The biodiversity credit report is included in Table 27.

Table 27: Species credit species

Species	Common Name	Direct impact (Number of individuals)	Credits required
Syzygium paniculatum	Magenta Lilly Pilly	1	2

A biodiversity credit report is included in **Appendix C**.

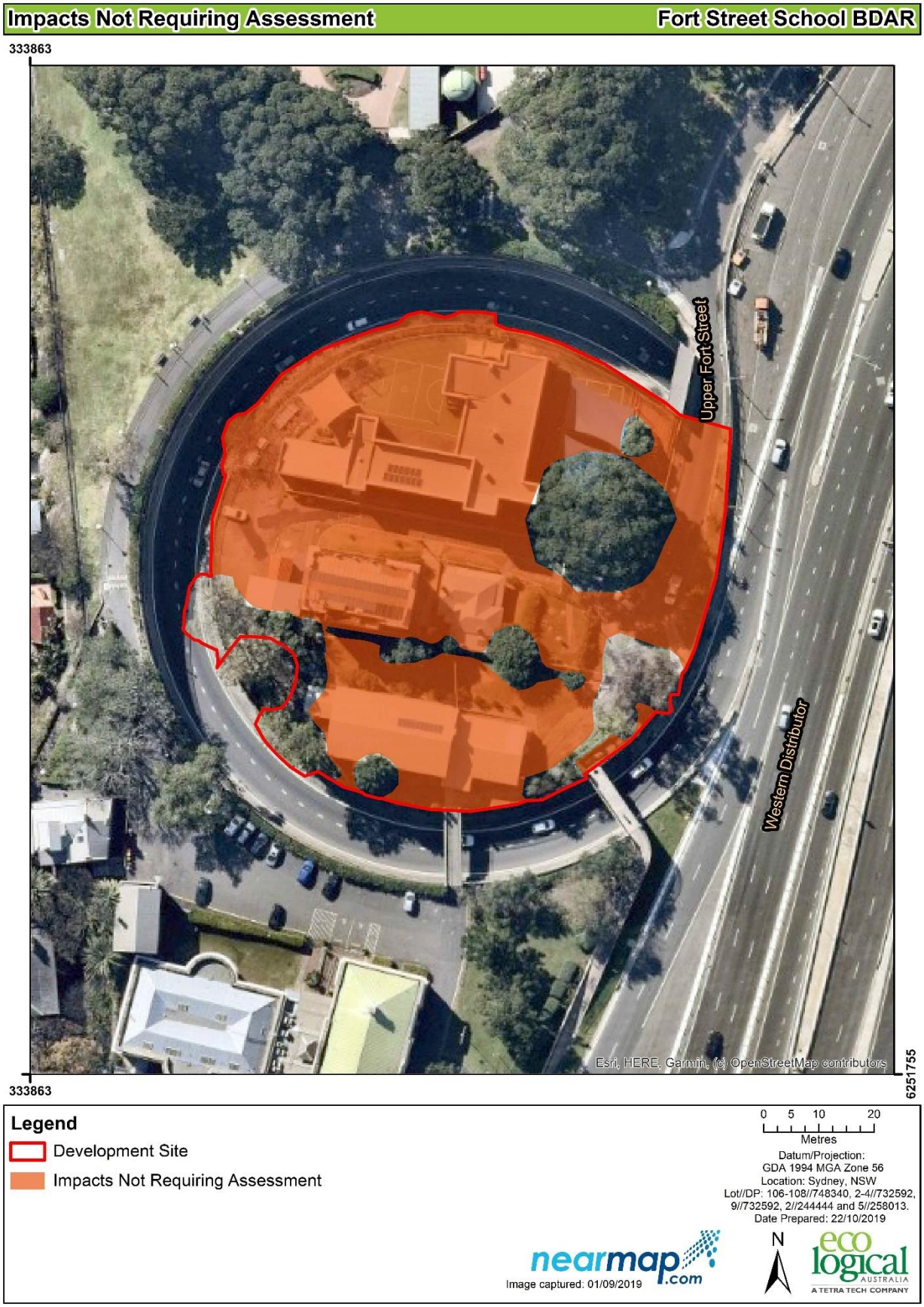

Figure 7: Areas not requiring assessment

2.5 Consistency with legislation and policy

Additional matters relating to impacts on flora and fauna which are not covered by the BC Act must also be addressed for the proposed development. Potential MNES in accordance with the EPBC Act have been addressed below.

2.5.1 Environment Protection and Biodiversity Conservation Act 1999

The following assessment has been prepared in accordance with the EPBC Act Matters of National Environmental Significance: Significant Impact Guidelines 1.1 (DoE 2013). These guidelines have been established to assist proponents to determine whether a proposed action is likely to result in a significant impact on a matter of national environmental significance.

2.5.1.1 Lathamus discolor (Swift Parrot)

The Swift Parrot migrates to the Australian south-east mainland between February and October. Favoured feed trees for this species include winter flowering species such as *Eucalyptus robusta*, *Corymbia maculata*, *Corymbia gummifera*, Forest Red Gum *Eucalyptus tereticornis*, *Eucalyptus sideroxylon* and *Eucalyptus albens*. No Swift Parrots were identified within the development site during field survey. The development site includes a *Corymbia gummifera* which is proposed for removal.

Criterion	Question	Response
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility of the following:		
1)	will the action lead to a long-term decrease in the size of a population	An important population is defined as a population that is necessary for a species' long-term survival and recovery. The Swift Parrot occurs as a single, migratory population. No breeding habitat will be affected by the proposed action. The proposed action will remove 0.15 ha of vegetation, including a favoured feed tree. The Swift Parrot travels long distances on feeding forays. Given the proximity of more suitable habitat to the site, the removal of this potential foraging habitat would not lead to the long-term decrease in the size of an important population of Swift Parrot
2)	will the action reduce the area of occupancy of the species	The proposed action would reduce the amount of potential foraging habitat for this species by removing one favoured food tree. The Swift Parrot is not known to occupy the subject site but may occasionally forage within the subject site. The Grey-headed Flying-fox is recorded as travelling long distances on feeding forays and would likely utilise the potential foraging habitat outside of the development site in Observatory Hill Park.
3)	will the action fragment an existing population into two or more populations	The proposed action will remove 0.15 ha of vegetation, including a favoured feed tree for the species. Other areas of foraging habitat are present in the region. The species is highly mobile and the proposed action will not fragment an existing important population into two or more populations.
4)	will the action adversely affect habitat critical to the survival of a species	The proposed action will remove 0.15 ha of vegetation, which comprises one favoured feed tree for the Swift Parrot. The Swift Parrot is a highly mobile species and

Criterion	Question	Response
		suitable habitat is available outside of the development site in Observatory Hill Park.
5)	will the action disrupt the breeding cycle of a population	The proposed action will remove 0.15 ha of vegetation, which comprises one favoured feed tree for the Swift Parrot. The proposed action will not disrupt the breeding cycle of the Swift Parrot given that breeding habitat will be impacted by the proposed action and suitable foraging habitat is available adjacent to the subject site.
6) i	will the action modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed action will remove 0.15 ha of vegetation, which comprises one favoured feed tree for the Swift Parrot. The species is likely to utilise a large mosaic or foraging resources within the area. suitable habitat is available outside of the development site in Observatory Hill Park.
6) ii	will the action result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	proposed action is unlikely to result in the establishment of an invasive species that is harmful to the Swift Parrot.
7)	will the action introduce disease that may cause the species to decline	The Swift Parrot is subject to Beak and Feather Disease. The proposed action would not increase the incidence of this disease.
8)	will the action interfere with the recovery of the species	A National Recovery Plan for Swift Parrot was developed in 2011. The relatively small amount of foraging habitat to be removed is unlikely to substantially interfere with the recovery of this species.
Conclusion	Is there likely to be a significant impact?	No.

2.5.1.2 *Pteropus poliocephalus* (Grey-headed Flying-fox)

The Grey-headed Flying-fox utilises a wide variety of habitats (including disturbed areas) for foraging and are recorded as travelling long distances on feeding forays. Fruits and flowering plants of a wide variety of species are the main food source. The species roosts in large 'camps' of up to 200,000 individuals. Camps are usually formed close to water and along gullies however the species has been known to form camps in urban areas. This species was not recorded on site during the survey but has been recorded within 10 km of the site. The Nationally Important Flying-fox Camp located closest to the subject site is approximately 5 km to the southeast, in Centennial Park. For the purposes of this assessment, the local population is considered to be any individuals within a 20 km radius of the study area.

The proposed development will remove 0.15 ha of vegetation – some of which includes species that are potential foraging habitat for this species. No camps will be affected by the proposed development.

Criterion	Question	Response
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1)	lead to a long-term decrease in the size of an important population of a species	An important population is defined as a population that is necessary for a species' long-term survival and recovery.

Criterion	Question	Response
		No roosting habitat (camps) will be affected by the proposed action. The proposed action will remove 0.15 ha of vegetation, some of which comprises suitable foraging habitat for the Grey-headed Flying-fox. The Grey-headed Flying-fox is recorded as travelling long distances on feeding forays. Given the proximity of more suitable habitat to the site, the removal of this potential foraging habitat would not lead to the long-term decrease in the size of an important population of Grey-headed Flying-fox.
2)	reduce the area of occupancy of an important population	The proposed action would reduce the amount of potential foraging habitat for this species by 0.15 ha. The Grey-headed Flying-fox is not known to occupy the subject site in the form of a camp but may occasionally forage within the subject site. The Grey-headed Flying-fox is recorded as travelling long distances on feeding forays and would likely utilise the potential foraging habitat outside of the development site in Observatory Hill Park.
3)	fragment an existing important population into two or more populations	The proposed action will remove 0.15 ha of vegetation, some of which comprises suitable foraging habitat for the Grey-headed Flying-fox. No camps will be affected and other areas of foraging habitat are present in the region. The species is highly mobile and the proposed action will not fragment an existing important population into two or more populations.
4)	adversely affect habitat critical to the survival of a species	The Draft Recovery Plan for the Grey-headed Flying-fox 2017 identifies 'a continuous temporal sequence of productive foraging habitats, linked by migration corridors or stopover habitats, and suitable roosting habitat within nightly commuting distance of foraging areas' as habitat critical to the survival of the species. No camps will be affected by the proposed action. The proposed action will remove 0.15 ha of vegetation, some of which comprises suitable foraging habitat for the Grey-headed Flying-fox. The Grey-headed Flying-fox is recorded as travelling long distances on feeding forays and suitable habitat is available outside of the development site in Observatory Hill Park.
5)	disrupt the breeding cycle of an important population	The proposed action will remove 0.15 ha of vegetation, some of which comprises suitable foraging habitat for the Grey-headed Flying-fox. The proposed action will not disrupt the breeding cycle of the Grey-headed Flying-fox given that no camps will be impacted by the proposed action and suitable foraging habitat is available adjacent to the subject site.
6)	modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed action will remove 0.15 ha of vegetation, including foraging habitat for the Grey-headed Flying-fox. Grey-headed Flying-fox camps would not be removed or disturbed, and suitable habitat is available outside of the development site in Observatory Hill Park.

Criterion	Question	Response
7)	result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed action is unlikely to result in the establishment of an invasive species that is harmful to the Grey-headed Flying-fox.
8)	introduce disease that may cause the species to decline, or	Grey-headed Flying-fox are reservoirs for the Australian bat lyssavirus and can cause clinical disease and mortality in Grey-headed Flying-fox. The proposed action would not increase the incidence of this disease.
9)	interfere substantially with the recovery of the species.	A Draft National Recovery Plan for the Grey-headed Flying-fox was developed in 2017. The relatively small amount of foraging habitat to be removed is unlikely to substantially interfere with the recovery of this species.
Conclusion	Is there likely to be a significant impact?	No.

2.5.1.3 *Syzygium paniculatum* (Magenta Lilly Pilly)

The Magenta Lily Pily is found only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest. On the south coast the Magenta Lilly Pilly occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest. On the central coast the Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities.

One small individual Magenta Lilly Pilly was identified within the development site. The species has been planted and is a horticultural variety as evidenced by its attached nursery tag. The proposed development will remove the individual.

Criterion	Question	Response
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1)	lead to a long-term decrease in the size of an important population of a species	An important population is defined as a population that is necessary for a species' long-term survival and recovery. The *Syzygium paniculatum* proposed to be removed were identified outside of the known distribution and habitat for the species and are therefore unlikely to form part of an important population. Consequently, it is considered unlikely that the proposed development will lead to a long-term decrease in the size of an important population of *Syzygium paniculatum.*
2)	reduce the area of occupancy of an important population	The distribution of the species consists of a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest. The species is found in riverside gallery rainforests and remnant littoral rainforests which does not include the vegetation located within the study area. The trees to be removed are outside the typical area of occupancy for the species. Furthermore, the *Syzygium paniculatum* proposed to be removed are unlikely to form part of an important population. Consequently, it is considered that the proposed development will not reduce the area of

Criterion	Question	Response
		occupancy of an important population of *Syzygium paniculatum.*
3)	fragment an existing important population into two or more populations	The *Syzygium paniculatum* proposed to be removed were identified outside of the known distribution and habitat for the species and are therefore unlikely to form part of an important population. Consequently, it is considered unlikely that the proposed development will lead to a long-term decrease in the size of an important population of *Syzygium paniculatum.*
4)	adversely affect habitat critical to the survival of a species	The study area does not contain suitable habitat for this species. Additionally, according to the National Recovery Plan 2012 the study area is not located within a confirmed naturally occurring population for this species. Therefore, the study area is unlikely to be considered important or critical to the survival of the species. Consequently, it is considered that the proposed development will not adversely affect habitat critical to the survival of *Syzygium paniculatum.*
5)	disrupt the breeding cycle of an important population	Not applicable.
6)	modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The study area is outside of the known distribution and habitat for *Syzygium paniculatum.* The study area comprised highly modified and landscaped residential gardens with planted native and exotic flora. No potential habitat for the species was identified within the study area and it is considered unlikely that habitat for *Syzygium paniculatum* be present in the site locality, therefore the proposed development will not modify, destroy, remove or isolate or decease the availability or quality of habitat to the extent that the species is likely to decline.
7)	result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The study area is currently in a disturbed and modified condition and does not represent known habitat for this threatened species. Consequently, the proposed development is unlikely to result in the establishment of an invasive species that is harmful to *Syzygium paniculatum*.
8)	introduce disease that may cause the species to decline, or	*Syzygium paniculatum* are subject to *Austropuccinia psidii* (Myrtle Rust), a disease caused by an exotic fungus that threatens trees and shrubs in the Myrtaceae family resulting in deformed leaves, heavy defoliation of branches, reduced fertility, dieback, stunted growth, and plant death. It is considered unlikely that the proposed action would increase the incidence of this disease.
9)	interfere substantially with the recovery of the species.	A National Recovery Plan for *Syzygium paniculatum* was developed in 2012. The Plan states that landscape and garden plantings of *Syzygium paniculatum "*should be excluded from all actions related to the conservation of the species in the wild." Given the horticultural popularity of the species, and the location of the study area in relation to the species distribution and its habitat, it is considered that the trees to be removed were planted. Therefore, the

Criterion	Question	Response
		proposed removal of the five *Syzygium paniculatum* specimens would not interfere substantially with the recovery of this species.
Conclusion	Is there likely to be a significant impact?	No.

3. Conclusion

In conclusion the BDAR has assessed the proposal which will result in removal of:

- 0.15 ha of native and exotic vegetation:
  - 0.09 ha of native vegetation (PCT 1083) not listed under the EPBC and BC Acts and
  - 0.25 ha of landscaped gardens.
- one planted threatened flora species *Syzygium paniculatum* listed as endangered under the BC Act and vulnerable under the EPBC Act
- potential roosting habitat for threatened microbats bats although no scats and/or markings were observed
- potential seasonal foraging habitat for ecosystem credit species, being microbats and *Pteropus poliocephalus* (Grey-headed Flying-fox)
- potential adverse effects on three Matters of National Environmental Significance

Following assessment using the BAM calculator it was concluded that no ecosystem credits were required for plant community type impacted by the proposed development. Two species credits were required for the threatened *Syzygium paniculatum*. No credits were required for ecosystem species. No species credits were required for threatened microbats that may utilise the derelict building that were assessed under prescribed impacts.

Following assessment using the Commonwealth Significant Impact Criteria it was concluded that the development would not result in a significant impact to any of the potentially affected species listed under the BC Act.

4. References

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Appendix A Definitions

Terminology	Definition
Biodiversity credit report	The report produced by the Credit Calculator that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site, or on land to be biodiversity certified, or that sets out the number and class of biodiversity credits that are created at a biodiversity stewardship site.
BioNet Atlas	The BioNet Atlas (formerly known as the NSW Wildlife Atlas) is the OEH database of flora and fauna records. The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails) and some fish
Broad condition state:	Areas of the same PCT that are in relatively homogenous condition. Broad condition is used for stratifying areas of the same PCT into a vegetation zone for the purpose of determining the vegetation integrity score.
Connectivity	The measure of the degree to which an area(s) of native vegetation is linked with other areas of vegetation.
Credit Calculator	The computer program that provides decision support to assessors and proponents by applying the BAM, and which calculates the number and class of biodiversity credits required to offset the impacts of a development or created at a biodiversity stewardship site.
Development	Has the same meaning as development at section 4 of the EP&A Act, or an activity in Part 5 of the EP&A Act. It also includes development as defined in section 115T of the EP&A Act.
Development footprint	The area of land that is directly impacted on by a proposed development, including access roads, and areas used to store construction materials.
Development site	An area of land that is subject to a proposed development that is under the EP&A Act.
Ecosystem credits	A measurement of the value of EECs, CEECs and threatened species habitat for species that can be reliably predicted to occur with a PCT. Ecosystem credits measure the loss in biodiversity values at a development site and the gain in biodiversity values at a biodiversity stewardship site.
High threat exotic plant cover	Plant cover composed of vascular plants not native to Australia that if not controlled will invade and outcompete native plant species.
Hollow bearing tree	A living or dead tree that has at least one hollow. A tree is considered to contain a hollow if: (a) the entrance can be seen; (b) the minimum entrance width is at least 5 cm; (c) the hollow appears to have depth (i.e. you cannot see solid wood beyond the entrance); (d) the hollow is at least 1 m above the ground. Trees must be examined from all angles.
Important wetland	A wetland that is listed in the Directory of Important Wetlands of Australia (DIWA) and SEPP 14 Coastal Wetlands
Linear shaped development	Development that is generally narrow in width and extends across the landscape for a distance greater than 3.5 kilometres in length
Local population	The population that occurs in the study area. In cases where multiple populations occur in the study area or a population occupies part of the study area, impacts on each subpopulation must be assessed separately.
Local wetland	Any wetland that is not identified as an important wetland (refer to definition of Important wetland).
Mitchell landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000.

Terminology	Definition
Multiple fragmentation impact development	Developments such as wind farms and coal seam gas extraction that require multiple extraction points (wells) or turbines and a network of associated development including roads, tracks, gathering systems/flow lines, transmission lines
Operational Manual	The Operational Manual published from time to time by OEH, which is a guide to assist assessors when using the BAM
Patch size	An area of intact native vegetation that: a) occurs on the development site or biodiversity stewardship site, and b) includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤30 m for non-woody ecosystems). Patch size may extend onto adjoining land that is not part of the development site or stewardship site.
Proponent	A person who intends to apply for consent to carry out development or for approval for an activity.
Reference sites	The relatively unmodified sites that are assessed to obtain local benchmark information when benchmarks in the Vegetation Benchmarks Database are too broad or otherwise incorrect for the PCT and/or local situation. Benchmarks can also be obtained from published sources.
Regeneration	The proportion of over-storey species characteristic of the PCT that are naturally regenerating and have a diameter at breast height <5 cm within a vegetation zone.
Remaining impact	An impact on biodiversity values after all reasonable measures have been taken to avoid and minimise the impacts of development. Under the BAM, an offset requirement is calculated for the remaining impacts on biodiversity values.
Retirement of credits	The purchase and retirement of biodiversity credits from an already-established biobank site or a biodiversity stewardship site secured by a biodiversity stewardship agreement.
Riparian buffer	Riparian buffers applied to water bodies in accordance with the BAM
Sensitive biodiversity values land map	Development within an area identified on the map requires assessment using the BAM.
Site attributes	The matters assessed to determine vegetation integrity. They include: native plant species richness, native over-storey cover, native mid-storey cover, native ground cover (grasses), native ground cover (shrubs), native ground cover (other), exotic plant cover (as a percentage of total ground and mid-storey cover), number of trees with hollows, proportion of over-storey species occurring as regeneration, and total length of fallen logs.
Site-based development	a development other than a linear shaped development, or a multiple fragmentation impact development
Species credits	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection.
Subject land	Is land to which the BAM is applied in Stage 1 to assess the biodiversity values of the land. It includes land that may be a development site, clearing site, proposed for biodiversity certification or land that is proposed for a biodiversity stewardship agreement.
Threatened Biodiversity Data Collection	Part of the BioNet database, published by OEH and accessible from the BioNet website.
Threatened species	Critically Endangered, Endangered or Vulnerable threatened species as defined by Schedule 1 of the BC Act, or any additional threatened species listed under Part 13 of the EPBC Act as Critically Endangered, Endangered or Vulnerable.

Terminology	Definition
Vegetation Benchmarks Database	A database of benchmarks for vegetation classes and some PCTs. The Vegetation Benchmarks Database is published by OEH and is part of the BioNet Vegetation Classification.
Vegetation zone	A relatively homogenous area of native vegetation on a development site, land to be biodiversity certified or a biodiversity stewardship site that is the same PCT and broad condition state.
Wetland	An area of land that is wet by surface water or ground water, or both, for long enough periods that the plants and animals in it are adapted to, and depend on, moist conditions for at least part of their life cycle. Wetlands may exhibit wet and dry phases and may be wet permanently, cyclically or intermittently with fresh, brackish or saline water
Woody native vegetation	Native vegetation that contains an over-storey and/or mid-storey that predominantly consists of trees and/or shrubs

Terminology	Definition
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Terminology	Definition
Wetland	An area of land that is wet by surface water or ground water, or both, for long enough periods that the plants and animals in it are adapted to, and depend on, moist conditions for at least part of their life cycle. Wetlands may exhibit wet and dry phases and may be wet permanently, cyclically or intermittently with fresh, brackish or saline water
Woody native vegetation	Native vegetation that contains an over-storey and/or mid-storey that predominantly consists of trees and/or shrubs

Appendix B Vegetation plot data

Table 28: Species matrix (species recorded by plot)

Stratum	Form	Species name	Exotic (*)	High Threat Weed (*)	Cover Plot 1 (%)	Cover Plot 2 (%)
	TG	*Banksia integrifolia* subsp. *integrifolia*				0.1
		Bidens pilosa	*	*		0.1
	SG	*Callistemon citrinus*				2
	FG	*Carpobrotus glaucescens*				0.1
	TG	*Ceratopetalum gummiferum*				0.1
	TG	*Corymbia gummifera*				2
	FG	*Cotula australis*				0.1
	GG	*Cynodon dactylon*				10
	FG	*Dianella caerulea* var. *caerulea*				0.1
		Ehrharta erecta	*	*		0.2
	TG	*Eucalyptus tereticornis*				5
	GG	*Ficinia nodosa*				0.1
U	TG	*Ficus macrophylla*			70	
	OG	*Geitonoplesium cymosum*				0.1
		Hypochaeris radicata	*			0.1
		Leucadendron laureolum				0.1
	GG	*Lomandra hystrix*				0.1
	GG	*Lomandra* sp.				2
U	TG	*Lophostemon confertus*			35	
		Lysimachia arvensis	*			0.1
	SG	*Melaleuca nodosa*				0.2
	FG	*Oxalis* sp.				0.1
	OG	*Passiflora* sp.				0.1
	FG	*Polygala* sp.				0.1
		Romulea rosea var. *australis*	*	*		10
		Soliva sessilis	*			0.1
		Stenotaphrum secundatum	*	*		10
	SG	*Syzygium paniculatum*				0.1
		Taraxacum officinale	*			0.1

G = Ground, M = Midstorey, U= Understorey TG = Tree, SG = Shrub, GG = Grass & Grasslike, FG = Forb, EG = Fern, OG = Other.

Table 29: Vegetation integrity data (Composition, Structure and function)

Plot location data							
Plot no.	PCT	Vegetation Zone	Condition	Zone	Latitude	Longitude	Bearing
1	1083	Garden	Planted	56	-33.860619	151.205180	357
2	1083	Low Condition	Low	56	-33.8608645	151.205193	257

Composition (number of species)						
Plot no.	Tree	Shrub	Grass	Forb	Fern	Other
1	2	0	0	0	0	0
2	4	3	4	5	0	2

Structure (Total cover %)						
Plot no.	Tree	Shrub	Grass	Forb	Fern	Other
1	105.0	0.0	0.0	0.0	0.0	0.0
2	7.2	2.3	12.2	0.5	0.0	0.2

Function												
Plot no.	Large Trees	Hollow trees	Litter Cover (%)	Length Fallen Logs (m)	Tree Stem 5-9 cm	Tree Stem 10-19 cm	Tree Stem 20-29 cm	Tree Stem 30-49 cm	Tree Stem 50-79 cm	Tree Stem 80+ cm	Tree Regen	High Threat Weed Cover (%)
1	1	1	0.2	0	0	0	0	1	0	0	0.0	1
2	1	0	4.4	0	1	0	1	0	0	0	20.2	1

For stem size classes: 0 = Absence, 1 = Presence.

Figure 8: Plot 1 start. Plot 1 end was not photographed because it was located within the Cahill Cut.

Figure 9: Left: Plot 2 Start. Right: Plot 2 End.

Appendix C Biodiversity credit report

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00017899/BAAS17069/19/00017900	Fort St	26/11/2019
Assessor Name	Report Created	BAM Data version *
	17/03/2020	22
Assessor Number	BAM Case Status	Date Finalised
	Open	To be finalised
Assessment Revision	Assessment Type	
8	Major Projects	

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	Vegetation integrity loss / gain	Area (ha)	Constant	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion								
1	1083_Garden	9.2	0.1	0.25	High Sensitivity to Potential Gain	1.50		0

BAM Credit Summary Report

2	1083_Low	16.6	0.0	0.25	High Sensitivity to Potential Gain	1.50		0
							Subtotal	**0**
							Total	**0**

Species credits for threatened species

Vegetation zone name	Habitat condition (HC)	Area (ha) / individual (HL)	Constant	Biodiversity risk weighting	Potential SAII	Species credits
Syzygium paniculatum / Magenta Lilly Pilly (Flora)						
1083_Low	N/A	1	0.25	2	False	2
					Subtotal	**2**

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