Botany Aquatic Centre – Flora and Fauna Assessment

Bayside Council

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Template 2.8.1

Contents

List of Figures

List of Tables

Abbreviations

Abbreviation	Description
BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offset Scheme
DAWE	Commonwealth Department of Agriculture, Water and Environment
ELA	Eco Logical Australia
EP&A Act	*Environmental Planning and Assessment Act 1979*

Abbreviation	Description
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
FFA	Flora and Fauna Assessment
GHFF	Grey-Headed Flying Fox
GIS	Geographic Information System
GPS	Global Positioning System
MNES	Matters of National Environmental Significance
PCT	Plant Community Type
SAII	Serious and Irreversible Impact
SEPP	State Environmental Planning Policy
SIS	Species Impact Statement
TEC	Threatened Ecological Community

Executive Summary

Eco Logical Australia Pty Ltd (ELA) was engaged by Co-Op Studio on behalf of Bayside Council to provide a Flora and Fauna Assessment (FFA) for the proposed upgrade of the Botany Aquatic Centre. ELA understands that the following Flora and Fauna Assessment will be assessed under Part 4 local development of the *Environmental Planning and Assessment Act 1979* (EPA & Act). This report also addresses the *Biodiversity Conservation Act 2016* (BC Act), *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

ELA undertook an identification of known or potential habitat for threatened species and communities within the study area, and an assessment of the likely impact of the proposed works to any threatened species or communities.

No threatened ecological communities (TECs) were identified on site, with the site represented by planted natives and exotic/cleared vegetation.

Potential habitat for threatened species identified within the study area consists of native vegetation including Broadleaved Paperbark (*Melaleuca quinquenervia*) and Swamp Mahogany (*Eucalyptus robusta)* which may provide marginal foraging habitat for highly mobile threatened species such as the Grey-headed Flying Fox (*Pteropus poliocephalus*) as well as potential temporary roosting habitat for threatened microbats.

However, these species are unlikely to remain roosting in these localities for long periods of time and the habitat observed does not constitute suitable breeding habitat. The surrounding areas present higher quality vegetation and are likely to be preferred over that present on site for roosting and breeding.

The proposed development will require the removal of seven trees as follows:

- 1 Spotted Gum (*Corymbia Maculata*)
- 4 Broad Leaved-Paperbark (*Melaleuca quinquenervia*)
- 1 Cedar Wattle (*Acacia elata*)
- 1 Swamp Mahogany (*Eucalyptus robusta)*

Due to the degraded nature of the site, low connectivity to surrounding habitat and waterways and relatively small amount of vegetation removal required, and with more suitable habitat available in the surrounding area associated with the nearby Botany Wetlands riparian habitat, the site is considered to be of low importance to the persistence of any threatened flora and fauna populations in the locality.

A Test of significance in accordance with Section 7.3 of the BC Act and a Significance Assessment in accordance with the EPBC Act was undertaken for one species, the Grey-headed Flying-fox) *Pteropus poliocephalus*, which determined that no significant impact would occur as a result of the development.

The preparation of a Species Impact Statement (SIS) or Biodiversity Development Assessment Report (BDAR) is not recommended.

The proposed upgrades at the Botany Aquatic Centre are not likely to have a significant impact on biodiversity values.

1. Introduction

1.1 Purpose of this report

Eco Logical Australia Pty Ltd (ELA) was engaged by Co-Op Studio on behalf of Bayside Council to prepare a Flora and Fauna Assessment Report for the proposed upgrade of Botany Aquatic Centre. ELA understands that this Flora and Fauna Assessment Report will be assessed under Part 4 local development under the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This report describes impacts on native vegetation, threatened species, populations and communities listed under the *Biodiversity Conservation Act 2016* (BC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and associated habitat features as a result of the proposed upgrade. The impact assessment in this report is based on information gathered from data searches and field investigations. The report sets out the legislative context, methods used, impacts on the environment and recommendations to minimise these impacts.

1.2 Subject site and subject site

For the purposes of this assessment, the following terms have been defined:

- **Study area** – the area where survey was undertaken (ie the development footprint)
- **Subject site** – The area outside of the subject site that may be indirectly impacted by the proposed activity (a 5km radius from the subject site).

1.3 Proposed work

The proposed work will involve the construction of an outdoor aqua play area, new slide, associated plant and change room facilities (Figure 1). The construction works will impact on some vegetation within the study area. A total of 0.207 ha of vegetation will be removed within the study area. This includes 0.059 ha of planted native vegetation. An additional 0.148 ha of mown exotic grass will be impacted due to construction impacts and earthworks required to install infrastructure.

1.4 Impact Assessment

The assessment of impacts of the proposed works on threatened species and communities was undertaken in accordance with the following steps:

- Identification of known or potential habitat for threatened species and communities within the subject site and subject site
- Assessment of the likely impact of the proposed works to any threatened species or communities
- Identification of any additional controls or mitigation measures to reduce impact

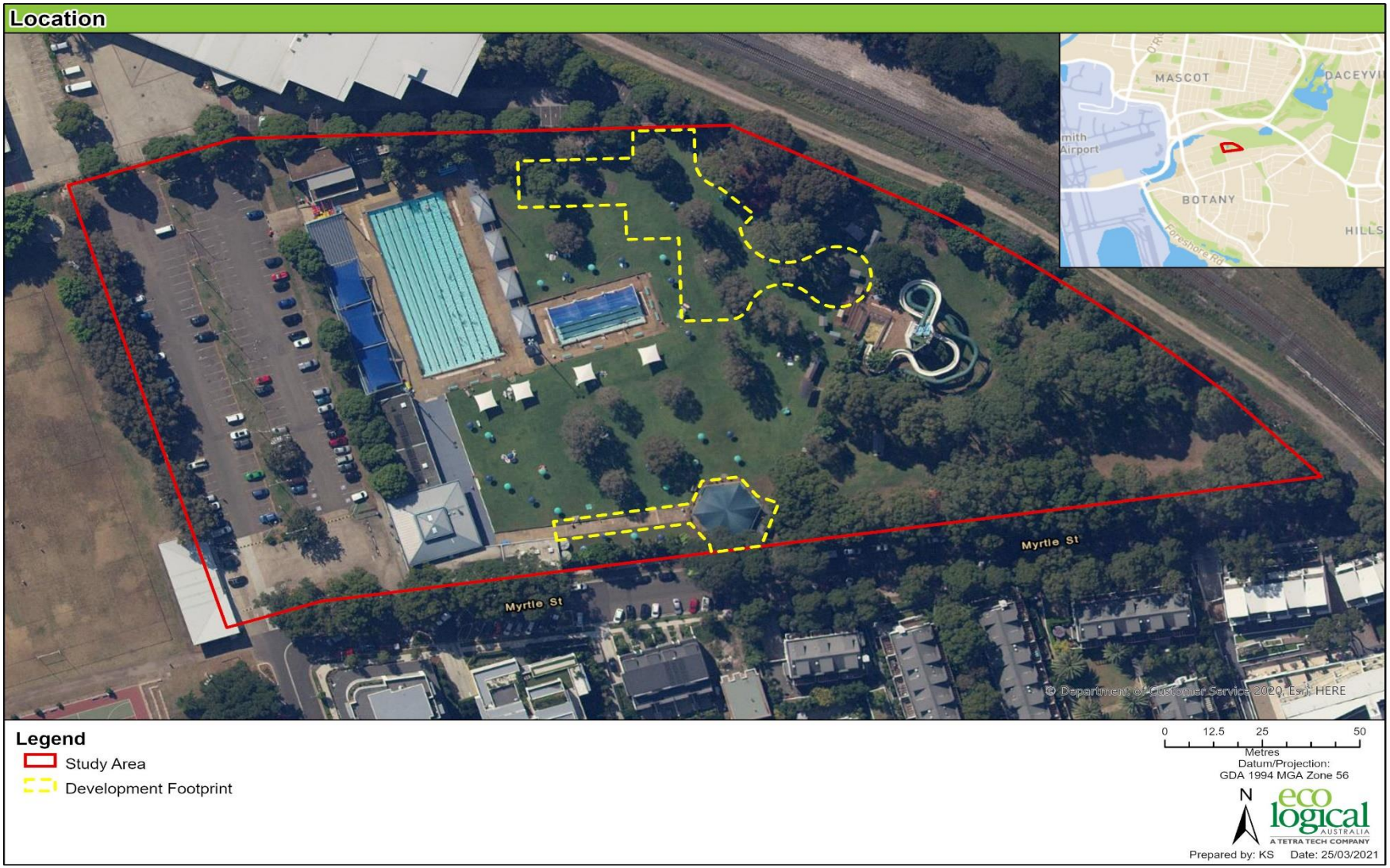

Figure 1: Study area location and surrounding area

2. Legislative Context

Table 1: Legislative context of the proposed development

Name	Relevance to the project
Commonwealth	
***Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)**	The EPBC Act aims to protect Matters of National Environmental Significance (MNES), including vegetation communities and species listed under the EPBC Act. If a development is likely to have a significant impact on MNES, it is likely to be considered a 'Controlled Action' by the Commonwealth and requires assessment and approval by the Commonwealth in order to proceed. The MNES that have been considered during this assessment are: • Listed threatened species and communities • Listed migratory species
State	
Environmental Planning and Assessment Act 1979 (EP&A Act)	The EP&A Act is the principal planning legislation for NSW. It provides a framework for the overall environmental planning and assessment of development proposals. The proposed works are being assessed under Part 4 of the EP&A Act.
***Biodiversity Conservation Act 2016* (BC Act)**	The overall purpose of the BC Act is to provide the legislative framework to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. Among other things, the BC Act outlines the assessment requirements to determine whether a proposed development or activity (Part 4/Part 5 of the EP&A Act) is likely to significantly affect threatened species or ecological communities, or their habitats under section 7.3 of the Act, and whether the Biodiversity Offsets Scheme (BOS) will be triggered. If thresholds for the BOS and application of the Biodiversity Assessment Method (BAM) are triggered, a Biodiversity Development Assessment Report (BDAR) would be required. Triggers for the BOS and BAM are as follows: • Exceeding a native vegetation area clearance threshold relative to minimum lot size; or • Clearing of native vegetation identified on the NSW Government Biodiversity Values (BV) Map; or • A significant impact on a threatened species or ecological community (as assessed by a qualified ecologist). The BC Act also introduces the principle of Serious and Irreversible Impacts (SAII). SAII's are not a threshold trigger for the BOS however they must be addressed if a BDAR is required to be prepared. The BC Act requires a local council to reject a local development (under Part 4 of the EP&A Act) if an action is likely to have a serious and irreversible impact on biodiversity values. This report documents that clearing of native vegetation does not exceed the clearance threshold relative to minimum lot size; the study area is not mapped on the BV Map; it assesses the likelihood of threatened species and concludes that the development is not likely to have a significant impact on threatened species or their habitats; and as a result the BOS is not triggered by the development.
Planning Instruments	
State Environmental Planning Policy (SEPP) (Koala Habitat Protection) 2020	The Bayside Council local government area (LGA) is not a listed LGA for which the State Environmental Planning Policy (Koala Habitat Protection) 2020 applies.
Local	
Botany Bay Local Environmental Plan (LEP) 2013	The subject site is not mapped on land that is located on the Terrestrial Biodiversity Layer of the Botany Bay LEP.

3. Methodology

3.1 Literature review and database search

A review of readily available databases pertaining to the ecology and environmental features of the subject site and study area, including existing vegetation mapping, was conducted to identify records of threatened species, populations and communities and their potential habitat. Databases and vegetation mapping that were reviewed included:

- BioNet (Atlas of NSW Wildlife) database search (5 km) threatened species, populations and ecological communities listed under the BC Act (accessed 2 March 2021).
- EPBC Act Protected Matters Search Tool (5 km) for threatened and migratory species, populations and ecological communities listed under the Commonwealth EPBC Act 1999 (accessed 2 March 2021).
- Aerial mapping and vegetation mapping to assess the extent of vegetation including mapped TECs listed under the BC Act and / or EPBC Act.

Aerial photography (Google Maps and SIX Maps) of the subject site and surrounds were also used to investigate the extent of vegetation cover and landscape features. In addition, relevant Geographic Information System (GIS) datasets (soil, geology, drainage) were reviewed.

Species from both the Atlas of NSW Wildlife and Protected Matters Search Tool were combined to produce a list of threatened species, populations and communities that may occur within the subject site (Appendix A).

3.2 Field survey

A field survey within the development footprint was conducted on 3 March 2021 by ELA ecologist Julia Ryeland. The field survey aimed to complete the following:

- Determine best-fit Plant Community Type (PCT), condition and extent.
- Threatened flora and fauna habitat assessment.
- Hollow bearing tree search.
- Opportunistic fauna sightings.

3.2.1 Vegetation communities

Rapid point assessments were used to identify what vegetation communities and species were present within the subject site.

3.2.2 Fauna survey

Any opportunistic fauna sightings were noted during the field survey. Habitat features, such as hollow-bearing trees, culverts and rock outcrops, were marked spatially using a handheld Global Positioning System (GPS) unit.

3.2.3 Survey limitation

No additional targeted surveys for threatened flora and fauna species were conducted during the field survey. Instead, a habitat assessment was undertaken to determine the suitability of the study area to

provide habitat. Assessing the habitat features present was considered sufficient to assist in determining whether any threatened species are likely to be present and inform the potential requirements for impact assessments and pre-clearance surveys prior to works commencing.

4. Results

4.1 Literature review and database search

4.1.1 Vegetation communities

A review of the available vegetation mapping (OEH, 2016) identified the vegetation throughout the majority of the site as Urban Exotics/Natives.

4.1.2 Threatened species

The BioNet Atlas search and EPBC Protect Matters Search Tool returned a total of 59 fauna species and 11 flora species occurring, or having the potential to occur, within a 5 km radius of the subject site. No threatened species have been previously recorded within the study area (Figure 3).

Figure 2: Previous vegetation mapping within the locality (OEH, 2013)

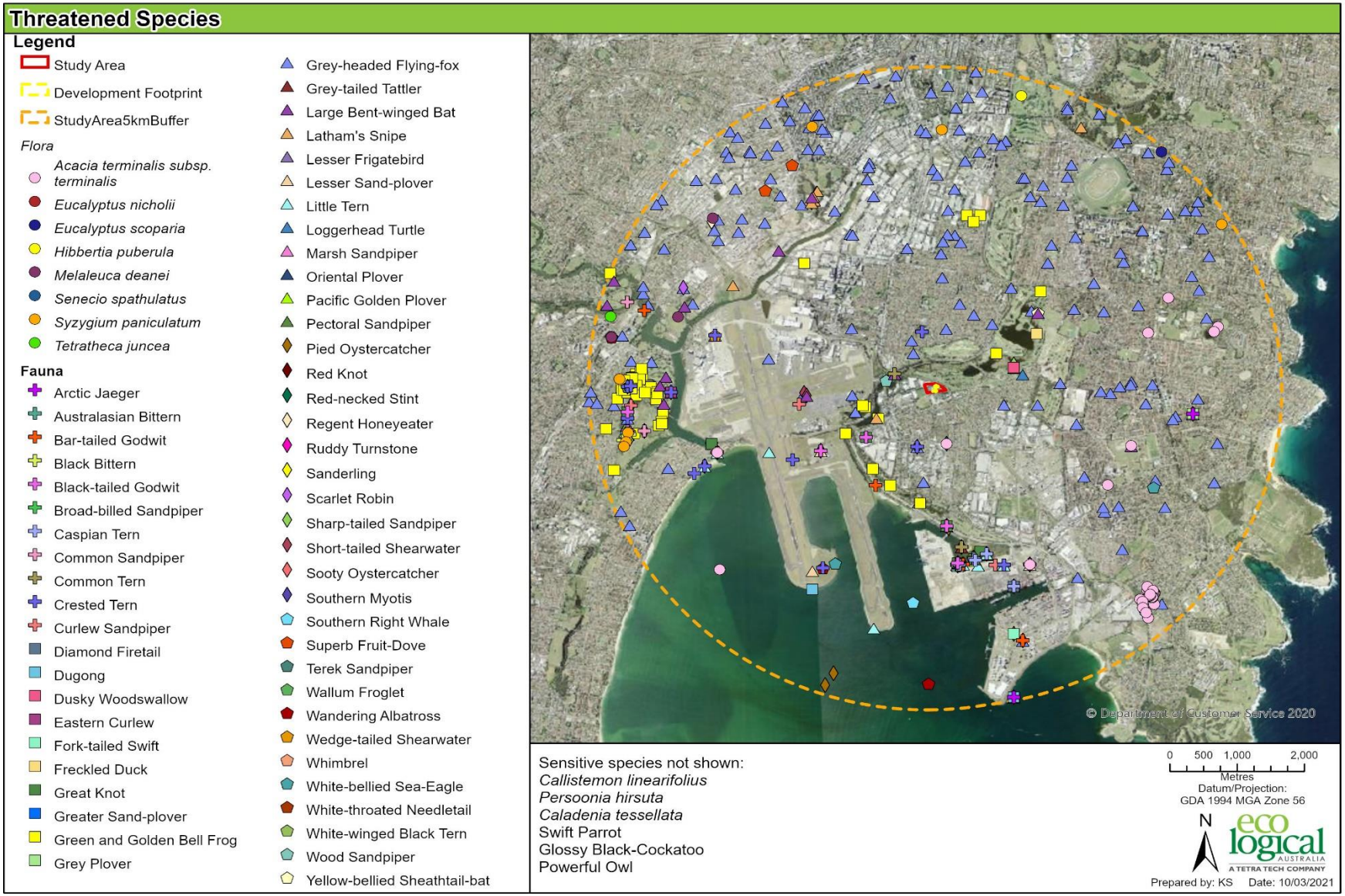

Figure 3: Threatened species previously recorded in the locality (BioNet, 2020) (some sensitive species locations have not been shown due to licensing requirements)

5. Field survey

5.1.1 Vegetation validation

The field survey confirmed the presence of the following vegetation communities within the study area (Figure 4):

- **Planted natives** – a variety of planted native species.
- **Exotic/cleared** – cleared areas dominated by exotics or covered in gravel.
- **Exotic Grasses** – mown exotic grasses

Below is a description of the vegetation identified during the field survey. No PCTs were identified, with all native vegetation having been planted. No Threatened Ecological Communities (TECs) listed under the BC Act or EPBC Act were present within the study area. The majority of natives were non-endemic. As indicated in the Arborist Assessment undertaken by Sturt Noble Arboriculture (2021), vegetation within the area would have consisted of 'Low Swamp Woodland and Eastern Suburbs Banksia Scrub'. Some large stands of endemic Broadleaved Paperbark (*Melaleuca quinquenervia*) still exist on site, however given their estimated age, it is likely that these individuals have been planted and the site has been previously cleared following the proclamation of Booralee Park as a reserve on 17 September 1886.

5.1.1.1 *Planted natives*

This vegetation zone was characterised as follows:

- Planted native canopy cover with no mid-storey and mown couch grass (*Cynodon dactylon*).

The majority of the study area containing planted natives has been regularly mown and maintained. As such, little ground cover was able to grow within this area (Figure 5).

5.1.1.2 Exotic/cleared

All ground cover vegetation and several trees within the southernmost portion of the study area represented exotic/cleared vegetation. Several *Ravenala sp.* have been planted on site. The groundcover consisted primarily of *Agapanthus sp.* that have been planted on site and was underlain by mulch.

5.1.1.3 Exotic Grasses

Groundcover within the study area consisted primarily of mown couch grass (*Cynodon dactylon*) which dominated the site. This represents a non-native landscape grass that is regularly maintained to improve recreation and amenity within the study area.

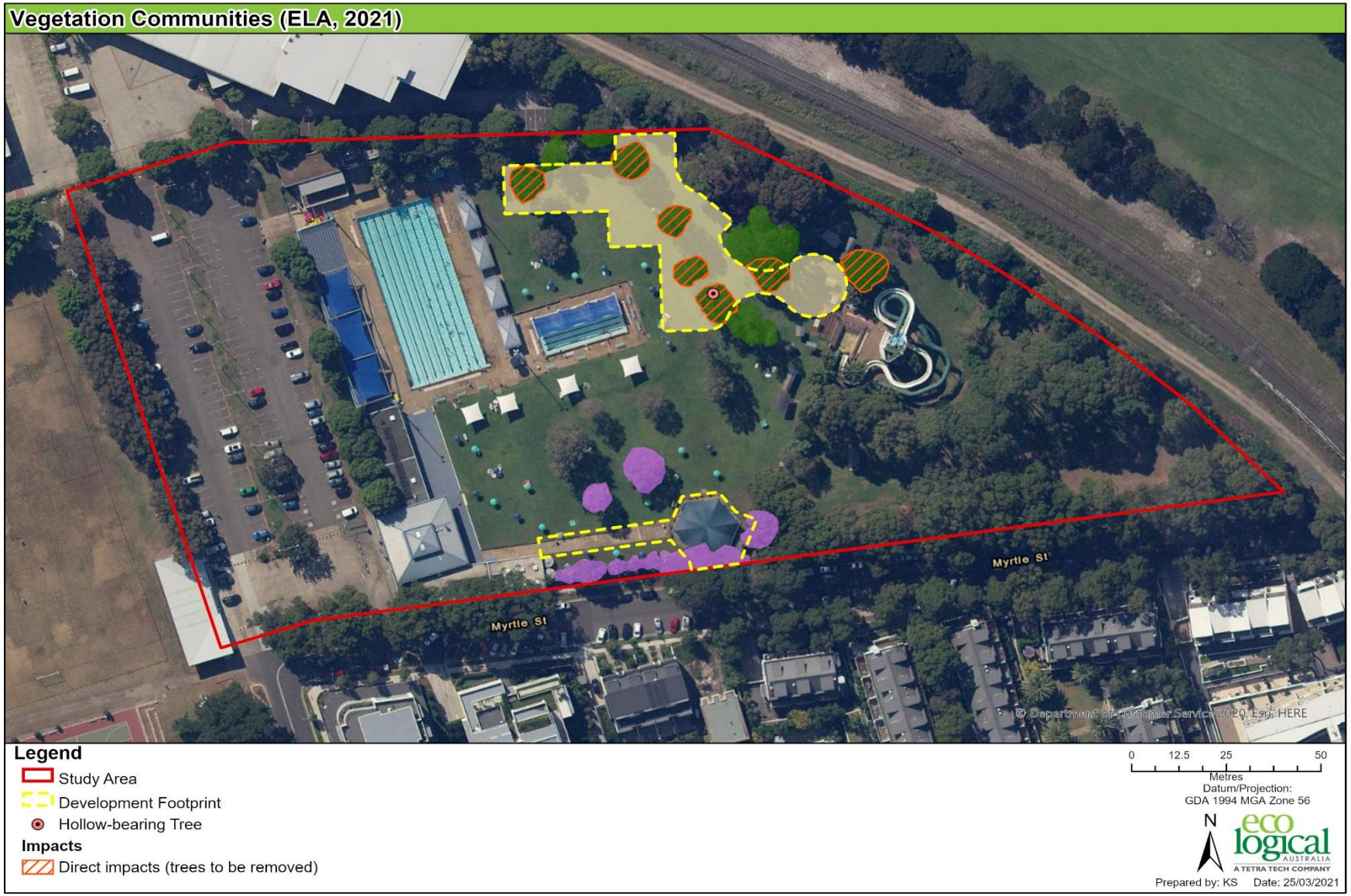

Figure 4: ELA Validated Vegetation on Site (2021)

Figure 5: Site photos of existing vegetation within the study area

5.1.2 Threatened species habitat

The subject site is surrounded predominately by urban settlement, with minimal connectivity to other habitat patches. This would likely decrease the potential for threatened fauna to use the site for foraging, roosting or nesting. The habitat also lacks complexity and diversity with minimal midstory vegetation which would decrease the suitability for many species, particularly given the high abundance of exotic ground cover. No threatened species were observed on site, nor have been observed on site historically.

Within the study area, four flowering mature Broadleaved Paperbark trees which may provide marginal foraging habitat for highly mobile species such as the Grey-headed Flying Fox (*Pteropus poliocephalus*) for which there are a number of records within 5 km of the subject site occur. However, the subject site has poor connectivity, no permanent water sources and is highly degraded and modified. More suitable habitat is available for this species in the surrounding area associated with the nearby Botany Wetlands riparian habitat. These alternative sites would provide better quality habitat and are therefore likely preferred by highly mobile species such as this. Given this species are most likely to forage in higher quality habitat located in the subject site, the importance of the vegetation identified on the subject site during the field survey for these species is low.

Three small hollows and decorticating bark was observed on one individual Broad Leaved Paperbark tree, as indicated spatially in Figure 4, and through imagery in Figure 6. Hollows such as those pictured in Figure 6 and decorticating bark and on paperbarks may be used under certain climatic conditions by long-eared bats and other threatened microbat species as temporary roosting habitat. However, these species are unlikely to remain roosting in these localities for long periods of time and the habitat observed does not constitute suitable breeding habitat. The surrounding areas present higher quality vegetation (i.e. within the nearby Botany Wetlands) and are likely to be preferred over that present on site for roosting and breeding.

The site is used by common fauna species however, such as Yellow-Tailed Black Cockatoo (*Calyptorhynchus funereus),* Noisy Miner (*Manorina melanocephala*) and Rainbow Lorikeet (*Trichoglossus moluccanus*) observed during the field survey.

Figure 6: Small hollows and decorticating bark found within one Broadleaved Paperbark due for removal

6. Impact assessment

6.1 Summary of impacts

6.1.1 Direct impacts

6.1.1.1 Vegetation communities

A summary of the extent of impacts to vegetation is provided in Table 2 below, and visually represented in Figure 4.

Table 2: Direct impact to vegetation within the subject site

Vegetation community	PCT	Direct Impact (ha)
Planted Native Vegetation	N/A	0.059
Exotic/ cleared	N/A	0.148

Within the study area, the following trees are due for removal:

- 1 Spotted Gum (*Corymbia Maculata*)
- 4 Broad Leaved-Paperbark (*Melaleuca quinquenervia*)
- 1 Cedar Wattle (*Acacia elata*)
- 1 Swamp Mahogany (*Eucalyptus robusta)*

The proposed activity will not impact on any TECs listed under the BC Act or under the EPBC Act, as no TECs occur within the development footprint.

6.1.1.2 Threatened flora

No threatened flora species occur on site, and the proposed development will not have a direct or indirect impact on any local populations of threatened flora species.

6.1.1.3 Threatened fauna

Due to the degraded nature of the site, low connectivity to surrounding habitat and waterways and relatively small amount of vegetation removal required, the site is considered to be of low importance to the persistence of any threatened fauna populations in the locality.

Three small hollows and decorticating bark was observed on one individual Broad Leaved Paperbark tree. However, it was determined that this tree is unlikely to constitute preferential roosting habitat. The habitat observed also does not constitute suitable breeding habitat for threatened microbat species.

A Test of Significance in accordance with the BC Act was also undertaken for the Grey-Headed Flying fox, which also concluded that the proposed development is unlikely to have a significant impact on this species (Appendix B).

6.1.2 Indirect impacts

Indirect impacts are those that do not directly affect the habitat or species within the subject site but have the potential to interfere through indirect actions. Indirect impacts associated with the proposed activity are:

- Increased spread of exotic species due to increase in access to the subject site and as a result of earthwork.

The overall effect of this potential impact is considered to be negligible for any threatened fauna species which may occur within the study area.

6.2 NSW *Biodiversity Conservation Act 2016* (BC Act)

In November 2016 the NSW parliament passed the BC Act, that replaced the *Threatened Species Conservation Act 1995*, and which took effect on 25 August 2017. Among other things, the BC Act introduces new requirements for biodiversity assessment (Biodiversity Assessment Methodology (BAM)) and requires proponents to offset certain biodiversity impacts through the purchase and retirement of biodiversity credits known as the Biodiversity Offset Scheme (BOS). For a local development under Part 4 of the *Environmental Planning and Assessment Act 1979*, the BOS and the BAM may be triggered by the following means:

- Exceeding the area of clearing threshold associated with the minimum lot size for the property (Table 3)
- The impacts occur on an area mapped on the NSW Government Biodiversity Values Map.

Table 3: Area clearing threshold

Minimum lot size associated with the property	Threshold for clearing native vegetation, above which the BAM and offsets scheme apply
Less than 1 ha	0.25 ha or more
1 ha to less than 40 ha	0.5 ha or more
40 ha to less than 1000 ha	1 ha or more
1000 ha or more	2 ha or more

6.2.1 Area clearing threshold

The property has a minimum lot size which Is between 1 ha and 40 ha, and the proposed clearing for the development will remove 0.059 ha of native and exotic plantings. Therefore, it does not meet the threshold trigger for the Biodiversity Offset Scheme under s7.3 of the BC Act.

6.2.2 Biodiversity Values Map

The BV Map identifies land considered to have high biodiversity value as defined by the Biodiversity Conservation Regulation 2017. The study area does not contain any areas mapped as high biodiversity value on the BV Map (accessed on 03 March 2021).

6.2.3 Key Threatening Processes

The Key Threatening Processes (KTPs) listed under the BC Act and / or EPBC Act that are likely to be relevant to the proposed development include:

- Clearing of native vegetation (BC Act) / land clearance (EPBC Act)

6.2.4 Test of Significance

6.2.4.1 Endangered Ecological Communities

No endangered ecological communities were present within the study area, hence no further assessment is required under Section 7.3 of the BC Act for endangered ecological communities.

6.2.4.2 Threatened Flora

No threatened flora species were recorded within the study area during the survey. Furthermore, no suitable habitat was considered to be present for any threatened flora species due to the high level of vegetation modification and disturbance. Hence no further assessment is required under Section 7.3 of the BC Act for threatened flora species.

6.2.4.3 Threatened fauna

No threatened fauna species were recorded within the study area during the survey. Furthermore, no suitable habitat was considered to be present for any threatened fauna species due to the high level of vegetation modification and disturbance. The removal of 0.059 ha of native vegetation is unlikely to have significant impact on any threatened fauna in the surrounding area.

However, a Test of Significance in accordance with the BC Act was undertaken for the Grey-Headed Flying Fox which may occasionally utilise the site for foraging. This Assessment concluded that the proposed development is unlikely to have a significant impact on this species (Appendix B).

6.3 *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act)

The EPBC Act establishes a process for assessing the environmental impact of activities and developments where MNES may be affected. Under the Act, any action which "has, will have, or is likely to have a significant impact on a MNES" is defined as a controlled action and requires approval from the Commonwealth Department of Agriculture, Water and the Environment (DAWE) which is responsible for administering the EPBC Act.

No threatened ecological communities or flora listed under the EPBC Act were recorded during the diurnal field surveys and based on habitat assessments, are unlikely to be adversely impacted by the proposal.

One nationally threatened fauna species, *Pteropus poliocephalus* (Grey-headed Flying-fox), may utilise foraging resources within the study area. In accordance with the EPBC Act, Significant Impact Criteria was applied to the Grey-headed Flying-fox which concluded that the activity is unlikely to constitute a significant impact on this species (Appendix C).

7. Mitigation Measures and Recommendations

The following recommendations have been made to reduce, eliminate or mitigate any detrimental effects that the proposed activities could have on, fauna, flora and the surrounding environment.

7.1 Prior to the works beginning

It is recommended that the following measures be in place prior to construction work beginning:

- Tree guard protection should be set up around all trees that are not to be impacted. Ideally, these measures would include physical barriers to prevent any accidental damage to these trees and utilise high visibility colouration to place emphasis on their location

7.2 During construction works

- Ensure tree guard protection remains installed around vegetation outside the impact area
- Ensure adequate sediment and erosion controls are in place to contain soil within the subject site

8. Conclusion

Eco Logical Australia Pty Ltd was engaged by Co-Op Studio to prepare a FFA for the proposed for the proposed upgrade of Botany Aquatic Centre. The proposed works will require the removal of seven trees as follows:

- Spotted Gum (*Corymbia Maculata*)
- 4 Broad Leaved-Paperbark (*Melaleuca quinquenervia*)
- Cedar Wattle (*Acacia elata*)
- Swamp Mahogany (*Eucalyptus robusta)*

Marginal foraging habitat is available for Grey-headed Flying Fox which may utilise the subject site an occasional basis, however, is unlikely to rely on these limited foraging resources for survival. It is unlikely that any additional threatened fauna utilise the subject site, due to the lack of records within the subject site, the degraded nature of the vegetation and the availability of larger high quality patches of vegetation located in the surrounding area. However, a Test of significance In accordance with the BC Act was applied for this species which concluded that the development is unlikely to constitute a significant impact (Appendix B). In accordance with the EPBC Act, Significant Impact Criteria was also applied to the Grey-headed Flying-fox which concluded that the activity is unlikely to constitute a significant impact on this species (Appendix C). As such, The preparation of a SIS or BDAR is not recommended.

Three small hollows and decorticating bark was observed on one individual Broad-Leaved Paperbark tree. Decorticating bark on paperbarks may be used under certain climatic conditions by long-eared bats and other threatened microbat species as temporary roosting habitat. However, these species are unlikely to remain roosting in these localities for long periods of time and the habitat observed does not constitute suitable breeding habitat. The surrounding areas present higher quality vegetation and are likely to be preferred over that present on site for roosting and breeding.

No threatened ecological communities were identified on site, with the site represented by planted natives, exotic/cleared vegetation and exotic grasses.

Due to the degraded nature of the site, low connectivity to surrounding habitat and waterways and relatively small amount of vegetation removal required, the site is considered to be of low importance to the persistence of any threatened flora and fauna populations in the locality.

The proposed upgrades at the Botany Aquatic Centre are not likely to have a significant impact on biodiversity values.

9. References

Department of Environment and Energy (DoEE) 2020. *EPBC Act Protected Matters Search Tool*: http://www.environment.gov.au/epbc/pmst/. Accessed 02 March 2021.

Office of Environment and Heritage (OEH) 2020. *Atlas of NSW Wildlife.* http://www.bionet.nsw.gov.au/ Accessed 02 March 2021.

Appendix A Likelihood of occurrence table

An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database search. Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposal site, results of the site inspection and professional judgement. Some Migratory or Marine species identified from the Commonwealth database search have been excluded from the assessment, due to lack of habitat. The terms for likelihood of occurrence are defined below:

- 'known' = the species was or has been observed on the site
- 'likely' = a medium to high probability that a species uses the site
- 'potential' = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- 'unlikely' = a very low to low probability that a species uses the site
- 'no' = habitat within the subject site and in the vicinity is unsuitable for the species

Information provided in the habitat associations' column has primarily been extracted (and modified) from the Commonwealth Species Profile and Threats Database and the NSW Threatened Species Profiles. Species and communities that have the potential to occur, are likely to occur or are known to occur have been boldened in the below table

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Associations	Likelihood of Occurrence	Test of significance required
Threatened Ecological Communities						
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion		V / CE	E	Sydney Basin Bioregion, mostly in the Cumberland IBRA sub-region, with small occurrences in the Sydney Cataract, Wollemi and Burragorang sub-regions. Occurs primarily on Tertiary sands and gravels of the Hawkesbury-Nepean river system.	No - this community was not identified within the subject site during field survey.	No
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community		E	E	Found on the coastal floodplains of NSW. Associated with grey-black clay-loams and sandy loams, where the groundwater is saline or sub-saline, on waterlogged or periodically inundated flats, drainage lines, lake margins and estuarine fringes associated with coastal floodplains.	No - this community was not identified within the subject site during field survey.	No
Coastal Upland Swamps in the Sydney Basin Bioregion		E	E	It occurs in the eastern Sydney Basin from the Somersby district in the north (Somersby-Hornsby plateaux) to the Robertson district in the south (n the Woronora plateau). Occur primarily on impermeable sandstone plateaux with shallow groundwater aquifers in the headwaters and impeded drainage lines of streams, and on sandstone benches with abundant seepage moisture.	No - this community was not identified within the subject site during field survey.	No
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion		E	CE	Occurs in western Sydney, with the most extensive stands occurring in the Castlereagh and Holsworthy areas. Mainly occurs on clay soils derived from the deposits of ancient river systems (alluvium), or on shale soils of the Wianamatta Shales.	No - this community was not identified within the subject site during field survey.	No
Eastern Suburbs Banksia Scrub of the Sydney Region		E	E	Predominately a sclerophyllous heath or scrub occasionally with small areas of woodland or low forest.	No - this community was not identified within the subject site during field survey.	No
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia		E	CE	Typically occurs within two kilometres of the coast; in NSW, found in the NSW North Coast, Sydney Basin and South East Corner bioregions.	No - this community was not identified within the subject site during field survey.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Associations	Likelihood of Occurrence	Test of significance required
				Occurs on dunes and flats, cheniers, berms, cobbles, headlands, scree, seacliffs, marginal bluffs, spits, deltaic deposits, coral rubble and islands.		
Posidonia australis seagrass meadows of the Manning-Hawkesbury ecoregion			E	The ecological community occurs mostly within the sheltered environments of permanently open estuaries along the warm temperate New South Wales coastline. Typically occurs in subtidal waters at depths ranging less than 1m to 10 m on sand and silty mud substrate. In these waters, salinity is close to marine levels, dropping only for short periods following rainfall.	No - this community was not identified within the subject site during field survey.	No
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E		Found on the river flats of the coastal floodplains. Associated with silts, clay-loams and sandy loams, on periodically inundated alluvial flats, drainage lines and river terraces associated with coastal floodplains.	No - this community was not identified within the subject site during field survey.	No
Shale Sandstone Transition Forest of the Sydney Basin Bioregion		CE	CE	Occurs at the edges of the Cumberland Plain in western Sydney, most now occurs in the Hawkesbury, Baulkham Hills, Liverpool, Parramatta, Penrith, Campbelltown and Wollondilly local government areas. Intergrade between clay soils from the shale rock and earthy and sandy soils from sandstone, or where shale caps overlay sandstone.	No - this community was not identified within the subject site during field survey.	No
Subtropical and Temperate Coastal Saltmarsh			V	Within a relatively narrow margin of the Australian coastline, within the subtropical and temperate climatic zones south of the South-east Queensland IBRA bioregion. Typically restricted to the upper intertidal environment.	No - this community was not identified within the subject site during field survey.	No
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion			E	Generally confined to the Sydney Basin bioregion. Found on igneous rock (predominately Tertiary basalt and	No - this community was not identified within the subject site during field survey.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Associations	Likelihood of Occurrence	Test of significance required
				microsyenite). Typically occurs at elevations between 650 and 1050 m above sea level.		
Western Sydney Dry Rainforest and Moist Woodland on Shale		E	CE	Cumberland Plain Sub-region of the Sydney Basin Bioregion. It generally occurs in rugged terrain and other patches may occur on undulating terrain, with dry rainforest patches typically occupying steep lower slopes and gullies, and moist woodland patches typically occupying upper sections of the slope.	No - this community was not identified within the subject site during field survey.	No
Flora						
Allocasuarina glareicola		E1	E	Primarily restricted to the Richmond (NW Cumberland Plain) district, but with an outlier population found at Voyager Point, Liverpool. Castlereagh woodland on lateritic soil.	Unlikely - suitable habitat not identified within the study area or subject site	No
Allocasuarina portuensis	Nielsen Park She-oak	E1	E	There are no naturally-occurring plants left at the original site (Nielsen Park, Sydney); however, the species has been planted successfully at a number of locations. Tall closed woodland, above a sandstone shelf approximately 20 m above the harbour. Soils are shallow and sandy; plantings have occurred on similar soils.	Unlikely - suitable habitat not identified within the study area or subject site	
Acacia bynoeana	Bynoe's Wattle	E1	V	Found in central eastern NSW. Heath or dry sclerophyll forest on sandy soils.	Unlikely - suitable habitat not identified within the study area or subject site	No
Acacia pubescens	Downy Wattle	V	V	Restricted to the Sydney region around the Bankstown-Fairfield-Rookwood and Pitt Town area, with outliers occurring at Barden Ridge, Oakdale and Mountain Lagoon. Open woodland and forest. Occurs on alluviums, shales and at the intergrade between shales and sandstones.	Unlikely - suitable habitat not identified within the study area or subject site	No
Eucalyptus camfieldii	Camfield's Stringybark	V	V	Narrow band from the Raymond Terrace area south to Waterfall. Coastal heath on shallow sandy soils overlying Hawkesbury sandstone, mostly on exposed sandy ridges.	Unlikely - suitable habitat not identified within the study area or subject site	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Associations	Likelihood of Occurrence	Test of significance required
Melaleuca biconvexa	Biconvex Paperbark	V	V	Only found in NSW, populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north. Damp places, often near streams or low-lying areas on alluvial soils.	Unlikely - suitable habitat not identified within the study area or subject site	No
Melaleuca deanei	Deane's Paperbark	V	V	Heath on sandstone. Ku-ring-gai/Berowra area, Holsworthy/Wedderburn area, Springwood (in the Blue Mountains), Wollemi National Park, Yalwal (west of Nowra) and Central Coast (Hawkesbury River) areas.	Unlikely - suitable habitat not identified within the study area or subject site	No
Syzygium paniculatum	Magenta Lilly Pilly	E1	V	Only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest. Subtropical and littoral rainforest on gravels, sands, silts and clays.	Unlikely - suitable habitat not identified within the study area or subject site	No
Rhodamnia rubescens	Scrub Turpentine	CE		Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	Unlikely - suitable habitat not identified within the study area or subject site	No
Rhodomyrtus psidiodes	Native Guava	E		Occurs from Broken Bay, approximately 90 km north of Sydney, New South Wales. Populations are typically restricted to coastal and sub-coastal areas of low elevation. Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines.	Unlikely - suitable habitat not identified within the study area or subject site	No
Caladenia tessellata	Thick Lip Spider Orchid	E1	V	Currently known from two disjunct areas; one population near Braidwood on the Southern Tablelands and three populations in the Wyong area on the Central Coast. Grassy sclerophyll woodland on clay loam or sandy soils, or low woodland with stony soil.	Unlikely - suitable habitat not identified within the study area or subject site	No
Cryptostylis hunteriana	Leafless Tongue Orchid	V	V	Mainly on coastal and near coastal ranges north from Victoria to near Forster. Coastal heathlands, margins of coastal swamps and	Unlikely - suitable habitat not identified within the study area or subject site	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Associations	Likelihood of Occurrence	Test of significance required
				sedgelands, coastal forest, dry woodland, and lowland forest.		
Genoplesium baueri	Bauer's Midge Orchid	E1	E	Has been recorded from locations between Nowra and Pittwater and may occur as far north as Port Stephens. Dry sclerophyll forest and moss gardens over sandstone.	Unlikely - suitable habitat not identified within the study area or subject site	No
Pterostylis saxicola	Sydney Plains Greenhood	E1	E	Restricted to western Sydney between Freemans Reach in the north and Picton in the south. Small pockets of shallow soil in depressions on sandstone rock shelves above cliff lines, adjacent to sclerophyll forest or woodland on shale/sandstone transition soils or shale soils.	Unlikely - suitable habitat not identified within the study area or subject site	No
Pterostylis sp. Botany Bay	Botany Bay Bearded Orchid	E1	E	Restricted to the Sydney region where it is known from a small number of sites within Botany Bay National Park on the Kurnell Peninsula. Coastal heath dominated by Melaleuca nodosa and Baeckea imbricata on skeletal sandy soils derived from sandstone.	Unlikely - suitable habitat not identified within the study area or subject site	No
Rhizanthella slateri	Rhizanthella slateri (Rupp) M.A. Clem. & Cribb in the Great Lakes local government area	E2,V	E	The population occurs near Bulahdelah (within the Great Lakes LGA).	Unlikely - suitable habitat not identified within the study area or subject site	No
Rhizanthella slateri	Eastern Australian Underground Orchid	V	E	In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra. Sclerophyll forest in shallow to deep loams.	Unlikely - suitable habitat not identified within the study area or subject site	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Associations	Likelihood of Occurrence	Test of significance required
Persicaria elatior	Tall Knotweed	V	V	In south-eastern NSW recorded from Mt Dromedary, Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. Beside streams and lakes, swamp forest or disturbed areas.	Unlikely - suitable habitat not identified within the study area or subject site	No
Persoonia hirsuta	Hairy Geebung	E1	E	Scattered distribution around Sydney, from Singleton in the north, along the east coast to Bargo in the south and the Blue Mountains to the west. Sandy soils in dry sclerophyll open forest, woodland and heath on sandstone.	Unlikely - suitable habitat not identified within the study area or subject site	No
Asterolasia elegans		E1	E	Occurs north of Sydney, in the Baulkham Hills, Hawkesbury and Hornsby local government areas. Hawkesbury sandstone. Found in sheltered forests on mid- to lower slopes and valleys.	Unlikely - suitable habitat not identified within the study area or subject site	No
Thesium australe	Austral Toadflax	V	V	In eastern NSW it is found in very small populations scattered along the coast, and from the Northern to Southern Tablelands. Grassland on coastal headlands or grassland and grassy woodland away from the coast.	Unlikely - suitable habitat not identified within the study area or subject site	No
Pimelea curviflora var. curviflora		V	V	Confined to the coastal area of the Sydney and Illawarra regions between northern Sydney and Maroota in the north-west and Croom Reserve near Albion Park in the south. Woodland, mostly on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes.	Unlikely - suitable habitat not identified within the study area or subject site	No
Pimelea spicata	Spiked Rice-flower	E1	E	Two disjunct areas; the Cumberland Plain (Marayong and Prospect Reservoir south to Narellan and Douglas Park) and the Illawarra (Landsdowne to Shellharbour to northern Kiama). Well-structured clay soils.	Unlikely - suitable habitat not identified within the study area or subject site	No
Allocasuarina glareicola		E1	E	Primarily restricted to the Richmond (NW Cumberland Plain) district, but with an outlier	Unlikely - suitable habitat not identified within the study area or subject site	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Associations	Likelihood of Occurrence	Test of significance required
				population found at Voyager Point, Liverpool. Castlereagh woodland on lateritic soil.		
Amphibia						
Heleioporus australiacus	Giant Burrowing Frog	V	V	Heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based. A northern population in the sandstone geology of the Sydney Basin as far south as Ulladulla, and a southern population occurring from north of Narooma through to Walhalla, Victoria.	Unlikely – suitable habitat not present within study area	No
Litoria aurea	Green and Golden Bell Frog	E1	V	Marshes, dams and stream-sides, particularly those containing Typha spp. (bullrushes) or Eleocharis spp. (spikerushes). Some populations occur in highly disturbed areas. Recorded from ~50 scattered sites within its former range in NSW.	Unlikely – suitable habitat not present within study area	No
Litoria raniformis	Southern Bell Frog	E1	V	Permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. Also found in irrigated rice crops. In NSW, only known to exist in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria.	Unlikely – suitable habitat not present within study area	No
Mixophyes balbus	Stuttering Frog	E1	V	Rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range. Along the east coast of Australia from southern Qld to north-eastern Victoria.	Unlikely – suitable habitat not present within study area	No
Aves						
Dasyornis brachypterus	Eastern Bristlebird	E1	E	Central and southern populations inhabit heath and open woodland with a heathy understorey. In northern NSW, habitat comprises open forest with dense tussocky grass understorey.	Unlikely – suitable habitat not present within study area	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Associations	Likelihood of Occurrence	Test of significance required
Falco hypoleucos	Grey Falcon	E1		Arid and semi-arid zones. Shrubland, grassland and wooded watercourses, occasionally in open woodlands near the coast, and near wetlands.	Unlikely – suitable habitat not present within study area	No
Gallinago hardwickii	Latham's Snipe		M	Migrant to east coast of Australia, extending inland west of the Great Dividing Range in NSW. Freshwater, saline or brackish wetlands up to 2000 m above sea-level; usually freshwater swamps, flooded grasslands or heathlands.	Unlikely – suitable habitat not present within study area	No
Grantiella picta	Painted Honeyeater	V	V	Widely distributed in NSW, predominantly on the inland side of the Great Dividing Range but avoiding arid areas. Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests.	Unlikely – marginal foraging habitat, with few flowering Eucalypts	No
Haliaeetus leucogaster	White-bellied Sea-Eagle	V		Distributed along the coastline of mainland Australia and Tasmania. Freshwater swamps, rivers, lakes, reservoirs, billabongs, saltmarsh and sewage ponds and coastal waters. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, forest and urban areas.	Unlikely – no permanent freshwater or connectivity to waterways or moist habitats. Degraded site with no suitable vegetation	No
Hirundapus caudacutus	White-throated Needletail		M	All coastal regions of NSW, inland to the western slopes and inland plains of the Great Divide. Occur most often over open forest and rainforest, as well as heathland, and remnant vegetation in farmland.	Unlikely – suitable habitat not present within study area	No
Lathamus discolor	Swift Parrot	E1	CE	In NSW, the species mostly occurs on the coast and south west slopes. Box-ironbark forests and woodlands.	Unlikely – No suitable breeding habitat and preferred foraging habitat not present.	No
Merops ornatus	Rainbow Bee-eater			Distributed across much of mainland Australia, including NSW. Open forests and woodlands, shrublands, farmland, areas of human habitation, inland and coastal sand dune systems, heathland, sedgeland, vine forest and vine thicket.	Unlikely – very degraded habitat with mostly cleared or planted vegetation. Marginal foraging habitat	No
Monarcha melanopsis	Black-faced Monarch		M	In NSW, occurs around the eastern slopes and tablelands of the Great Divide. Rainforest, open eucalypt forests, dry sclerophyll forests and	Unlikely – very degraded habitat with mostly cleared or planted vegetation. Marginal foraging habitat	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Associations	Likelihood of Occurrence	Test of significance required
				woodlands, gullies in mountain areas or coastal foothills, Brigalow scrub, coastal scrub, mangroves, parks and gardens.		
Monarcha trivirgatus	Spectacled Monarch			Coastal eastern Australia south to Port Stephens in NSW. Mountain/lowland rainforest, wooded gullies, riparian vegetation including mangroves.	Unlikely – very degraded habitat with mostly cleared or planted vegetation. Marginal foraging habitat	No
Motacilla flava	Yellow Wagtail		M	Regular summer migrant to mostly coastal Australia. In NSW recorded Sydney to Newcastle, the Hawkesbury and inland in the Bogan LGA. Swamp margins, sewage ponds, saltmarshes, playing fields, airfields, ploughed land, lawns.	Unlikely – very degraded habitat with mostly cleared or planted vegetation.	No
Myiagra cyanoleuca	Satin Flycatcher		M	In NSW, widespread on and east of the Great Divide and sparsely scattered on the western slopes, with very occasional records on the western plains.	Unlikely – very degraded habitat with mostly cleared or planted vegetation.	No
Neophema chrysogaster	Orange-bellied Parrot	E4A	CE	Occasional reports from NSW, most recently Shellharbour and Maroubra in May 2003. Eucalypt-dominated forests, especially near wetlands, watercourses, and heavily-vegetated gullies.	Unlikely – very degraded habitat with mostly cleared or planted vegetation. Marginal foraging habitat	No
Pandion haliaetus	Eastern Osprey	V		Found on the north and east coast from Broome to the south coast of New South Wales. wetlands of tropical and temperate Australia and off-shore islands, occasionally ranging inland along rivers.	Unlikely – no permanent freshwater or connectivity to waterways or moist habitats. Degraded site with no suitable vegetation	No
Mammals						
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	Largest concentrations of populations occur in the sandstone escarpments of the Sydney basin and the NSW north-west slopes. Wet and dry sclerophyll forests, Cyprus Pine dominated forest, woodland, sub-alpine woodland, edges of rainforests and sandstone outcrop country.	Potential – Broad-leaved paperbarks on site may be used occasionally as roost sites in the right climatic conditions	No – Roost sites under paperbark are unlikely to be used with regularity as they provide minimal thermal protection and are unsuitable as breeding habitat. Few

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Associations	Likelihood of Occurrence	Test of significance required
						very small holes present are unlikely to be able to be suitably access for breeding habitat. As such, no test of significance was deemed necessary
Dasyurus maculatus maculatus (SE mainland population)	Spotted-tailed Quoll	V	E	Found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Qld. Rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.	Unlikely – small, isolated patch with no available den sites (rock outcrops, hollows, fallen logs etc.)	No
Isoodon obesulus obesulus	Southern Brown Bandicoot (eastern)	E1	E	Found in south-eastern NSW, east of the Great Dividing Range south from the Hawkesbury River. Heath or open forest with a heathy understorey on sandy or friable soils.	Unlikely – very degraded habitat with mostly cleared or planted vegetation.	No
Miniopterus orianae oceanensis	Large Bent-wing Bat	V		Eastern Bentwing-bats occur along the east and north-west coasts of Australia. are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.	Unlikely - Poor quality foraging habitat is available in the study area. Roosting habitat not present.	No
Petauroides volans	Greater Glider population in the Eurobodalla local government area	E2	V	This population on the south coast of NSW is bounded by the Moruya River to the north, Coila Lake to the south and the Princes Highway and cleared land exceeding 700 m in width to the west. Eucalypt forests and woodlands.	Unlikely – degraded vegetation with no hollow bearing trees on site	No
Petrogale penicillata	Brush-tailed Rock-wallaby	E1	V	In NSW they occur from the Qld border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. Rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges.	Unlikely – degraded vegetation with no rocky escarpment, outcrops, or cliffs	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Associations	Likelihood of Occurrence	Test of significance required
Phascolarctos cinereus	Koala	V	V	In NSW, koala populations are found on the central and north coasts, southern highlands, southern and northern tablelands, Blue Mountains, southern coastal forests, with some smaller populations on the plains west of the Great Dividing Range. Inhabit eucalypt woodlands and forests.	Unlikely – very degraded habitat with mostly cleared or planted vegetation. Limited foraging habitat, with few mature Eucalypts. Low connectivity to surrounding habitat (area surrounded with high fences)	No
Potorous tridactylus tridactylus	Long-nosed Potoroo	V	V	In NSW it is generally restricted to coastal heaths and forests east of the Great Dividing Range, with an annual rainfall exceeding 760 mm. Coastal heaths and dry and wet sclerophyll forests.	Unlikely – very degraded habitat with mostly cleared or planted vegetation.	No
Pseudomys novaehollandiae	New Holland Mouse		V	Fragmented distribution across eastern NSW. Open heathlands, woodlands and forests with a heathland understorey, vegetated sand dunes.	Unlikely – very degraded habitat with mostly cleared or planted vegetation.	No
Pteropus poliocephalus	**Grey-headed Flying-fox**	**V**	**V**	**Along the eastern coast of Australia, from Bundaberg in Qld to Melbourne in Victoria. Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.**	**Potential – a small number (n = 5) potential feed trees, flowering seasonally but unpredictable. No significant roost in close proximity**	**Yes**
Reptilia						
Hoplocephalus bungaroides	Broad-headed Snake	E1	V	Largely confined to Triassic and Permian sandstones within the coast and ranges in an area within approximately 250 km of Sydney. Dry and wet sclerophyll forests, riverine forests, coastal heath swamps, rocky outcrops, heaths, grassy woodlands.	Unlikely – No shelters available with no rocks or escarpments. Low connectivity to surround areas	No

Appendix B Biodiversity Conservation Act 2016 Tests of Significance

The 'Assessment of significance' (5-part test) is applied to species, populations and ecological communities listed on Schedules 1 and 2 of the BC Act. The assessment sets out five factors, which when considered, allow proponents to undertake a qualitative analysis of the likely impacts of an action and to determine whether a significant impact is likely. All factors must be considered, and an overall conclusion made based on all factors in combination.

B1 *Pteropus poliocephalus* (Grey-headed Flying-fox)

The Grey-headed Flying-fox is listed as vulnerable under the BC Act and EPBC Act. This species was not observed during field survey and has not been recording in the study area. The construction works will remove 0.045 ha of native, planted vegetation. No camps will be affected by the proposed development. The closest Nationally Important Flying Fox Camp is located approximately 5.4 km north of the study area in the Centennial Parklands. An additional Nationally Important Flying-Fox 6.3 west of the study area in Turella.

BC Act	Question	Response
7.3.1 a)	In the case of a threatened species: whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	The proposed clearance on the subject site would result in removal of 0.059 ha of native, planted vegetation, of which five trees represent potential marginal foraging habitat for the Grey-headed Flying-fox (4 Broad Leaved-Paperbark *(Melaleuca quinquenervia)*and one Swamp Mahogany (*Eucalyptus robusta).* The additional 2 trees are not known to be key feed trees of the Grey-headed flying fox (GHFF) (Eby and Law 2008). No breeding habitat will be impacted as part of the proposed works. It is considered unlikely that the proposed works will place a viable population of the species at risk of extinction given that the site has no permanent water bodies, has low connectivity to surrounding habitat and higher quality, similar habitat is available near to the study area. Given that the species is highly mobile, it is likely to move to these higher quality patches if present.
7.3.1 b) i	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable
7.3.1 b) ii	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed development or activity is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.	Not applicable

BC Act	Question	Response
7.3.1 c) i	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	The proposed clearance of the study area will result in the removal of 0.059 ha of native, planted vegetation, most which is not considered key potential foraging habitat for the GHFF. Similar habitat is available along the nearby Botany Wetlands area.
7.3.1 c) ii	In relation to the habitat of a threatened species or ecological community: Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity	Native vegetation removal (0.059 ha) will be minimal. The vegetation available closer the known roosts is likely of higher quantity and would therefore be used preferentially by this highly mobile.
7.3.1 c) iii	In relation to the habitat of a threatened species or ecological community: The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.	The site is already isolated, with residential housing surrounding the site. Due to the poor connectivity and minimal habitat available on site, the species is unlikely to be using the vegetation that is proposed to be removed. This is supported by the lack of prior records on site.
7.3.1 d)	Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	There are no areas of outstanding biodiversity within the subject site.
7.3.1 e)	Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	One key threatening process, the removal of native vegetation, is relevant to this proposal. The proposed works are unlikely to contribute significantly to this process given that only 0.059 ha of isolated plated natives are proposed to be removed.
Conclusion	**Is there likely to be a significant impact?**	The proposal is unlikely to constitute to a significant impact on the Grey-headed Flying Fox given the following: • The site is in poor quality and constitutes planted natives, mostly which are not known to be significant roost or feed tree species • No camps of state or national significance occur in the local area, with individuals mostly sighted moving over suburban area near the subject site. As such, the clearance of the site will not impact any important populations. • As a result, the proposed development will not trigger the Biodiversity Offset Scheme with respect to impacts to the GHFF.

Appendix C Significant Impact Criteria (EPBC Act)

The EPBC Act establishes a process for assessing the environmental impact of activities and developments where MNES may be affected. Under the Act, any action which "has, will have, or is likely to have a significant impact on MNES" is defined as a "controlled action", and requires approval from the Commonwealth Department of Agriculture, Water and the Environment (DAWE), which is responsible for administering the EPBC Act.

The EPBC Act Significant Impact Criteria was applied to one species, *Pteropus poliocephalus* (Grey-headed Flying-fox), which may occur in the subject site. Grey-headed Flying-fox is listed as vulnerable under the EPBC Act.

C1 Environment Protection and Biodiversity Conservation Act 1999 Assessment of Significance for the Grey-headed Flying Fox

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 *Note: An 'important population' is a population that is necessary for a species' long-term survival and recovery (DoAWE 2013).*	The Grey-headed Flying Fox (GHFF) is considered to be one population that intermixes up and down the east coast, therefore any GHFF population is a meta-population of this one "important population". No roosting habitat (camps) will be affected by the proposed action. The proposed action will impact up to 0.059 ha of native vegetation (7 trees), of which two species (*Melaleuca quinquenervias* and *Ecualyptus robusta*) are considered to be a potential feed tree for GHFF. The proposed action will remove 5 of these trees. The site is isolated, with minimal habitat connectivity to nearby camps (DotEE 2021). The Grey-headed Flying-fox is recorded as travelling long distances during foraging (up to 50 km) and as such, are likely to be sighted moving through the area to more suitable habitat within the Botany Wetlands. Given the proximity of more suitable habitat, the removal of this potential 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	No important populations occur within the local area, with the closest camp of National significance being approximately 5.4 km to the north. Some individuals have been sighted in the local area, however these numbers are small in comparison to the known numbers at important roosting camps (*i.e.* which include hundreds of thousands of individuals). These individuals have all been sighted travelling across suburban areas, and no roosts have been sighted in any of the local vegetation patches connecting to the site.
3)	fragment an existing important population into two or more populations	According to the Draft Recovery Plan for the Grey-headed Flying-fox 2017, "the Grey-headed Flying-fox is considered

Criterion	Question	Response
		to be a single, mobile population with individuals distributed across Queensland, New South Wales, Victoria, South Australia, Tasmania and the ACT." The proposed action will not fragment an existing important population into two or more populations. No camps will be affected by the proposed action and other areas of foraging habitat are available for this highly mobile species within the region.
4)	adversely affect habitat critical to the survival of a species *Note: 'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:* • *for activities such as foraging, breeding, roosting, or dispersal* • *for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)* • *to maintain genetic diversity and long term evolutionary development, or* • *for the reintroduction of populations or recovery of the species or ecological community.*	The proposed tree removal (0.059 ha), consists of predominately *Melaleuca quinquenervia* – not known to be an important feed trees of the GHFF (Eby and Law 2008), though still a potential feed tree for this species, and 1 Swamp Mahogany (*Eucalyptus robusta),* which is a feed tree for this species. No roosting individuals have been recorded within subject site or any connecting vegetation. The species is recorded as travelling long distances (50 km) on feeding forays and similar habitat is available adjacent to the study area. As such, removal of the vegetation on site is unlikely to adversely affect habitat critical to the survival of a species
5)	disrupt the breeding cycle of an important population	The proposed action will not disrupt the breeding cycle of the Grey-headed Flying-fox given that no camps will be affected by the proposed action and suitable foraging habitat is available nearby to the study area.
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/modify up to 0.059 ha of vegetation, mostly of *Melaleuca quinquenervia,* which is not known as important foraging habitat for the Grey-headed Flying-fox. It is unlikely that the extent of this vegetation removal will cause the species to decline because suitable habitat is available nearby to the study area.
7)	result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposal would not result in invasive species, such as weeds, that would be harmful to GHFF. It is unlikely that the proposed clearance of the subject site will result in a large increase in the number of weeds due to the current disturbed nature of the site, particularly if managed during development
8)	introduce disease that may cause the species to decline, or	Grey-headed Flying-fox are reservoirs for the Australian bat lyssavirus (ABL) and can cause clinical disease and mortality in GHFF. It is estimated that <1% of the entire population is affected by the disease (DotEE, 2017). The proposed action is unlikely to present a significant ecological stress on any camps or on individuals that may utilise the subject site and therefore the works are unlikely to introduce or exacerbate

Criterion	Question	Response
		this virus or any other disease that may cause this species to decline.
9)	interfere substantially with the recovery of the species.	The removal of a small number of foraging trees is unlikely to interfere substantially with the recovery of the species.
Conclusion	**Is there likely to be a significant impact?**	The proposal is unlikely to result in a significant impact on Grey-headed Flying-fox. No camps will be removed by the proposed action. More suitable foraging habitat for this highly mobile species is available nearby to the study area.

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