



Proposed Extension of Existing Cemetery, Eastern Suburbs Memorial Park, Matraville

Flora and Fauna Assessment

Prepared for
Southern Metropolitan Cemeteries Trust

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Abbreviations

Abbreviation	Description
BDAR	Biodiversity Development Assessment Report
CE	Critically Endangered
CSTBS	Coastal Sand Tea-tree Banksia Scrub
DA	Development Application
DCP	Development Control Plan
DotE	Department of the Environment
DotEE	Department of the Environment and Energy
DPI	Department of Primary Industries
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd.
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Environment Protection Biodiversity Conservation Act 1999</i>
FFA	Flora and Fauna Assessment
KTP	Key threatening process
LEP	Local Environmental Plan
LGA	Local Government Area
MNES	Matters of National Environmental Significance
NSW	New South Wales
NW Act	<i>Noxious Weeds Act 1993</i>
OEH	Office of Environment and Heritage
PCT	Plant Community Type
SEPP	State Environmental Planning Policy
TEC	Threatened Ecological Community
TSC Act	<i>NSW Threatened Species Conservation Act 1995</i>
WONS	Weeds of National Significance

Executive summary

Eco Logical Australia (ELA) was commissioned by Southern Metropolitan Cemeteries Trust to provide a Flora and Fauna Assessment (FFA) to accompany a rezoning application for proposed works adjacent in Gwea Reserve (Lot 4858, D.P. 752015) and the adjacent council-owned land (Lot 7301; D.P. 1139143) (hereafter referred to collectively as the study area). The study area (comprising of approximately 5.05 ha) is located in Randwick Local Government Area (LGA). The concept plan proposes to remove most of the vegetation within the study area to expand Eastern Suburbs Memorial Park.

A site inspection was conducted on 17 July 2017 to verify the presence of native vegetation (and assigned to a Plant Community Type – PCT), threatened ecological communities, and threatened species and / or their habitat.

The following vegetation communities were recorded within the study area:

- Coastal Sand Tea-tree Banksia Scrub (CSTBS) – PCT 771
- Beach Spinifex Grassland – PCT 1204

No threatened species of flora or fauna were recorded during the site inspection.

Nine (9) weeds identified in the *Greater Sydney Regional Strategic Weed Management Plan 2017* (Greater Sydney RSWMP) were recorded within the study area, including four weeds of State-determined Priority, one weed of Regional Priority, and four weeds of Regional Concern.

The BC Act came into effect on 25 August 2017, and requires a BDAR to assess impacts on flora, fauna and vegetation communities. Transitional arrangements released on the 25 August 2017 have stated that '*Local developments [excluding select locations] will have three months from 25 August 2017 to submit a development application under the previous legislation.*' Based on the current project timeline, it is likely that a BDAR will be required for the proposed works.

The conceptual plan currently would remove approximately 1.32 ha of native vegetation from within the study area (**Section 5**), and thus offsetting under the BC Act would be required.

Impacts under the Biodiversity Conservation Act 2016 are offset by the following options:

- purchasing and retiring a calculated number of credits relative to the impact of the proposed works
- paying money into the 'Biodiversity Fund' with a premium.

1 Introduction

Eco Logical Australia (ELA) was commissioned by Southern Metropolitan Cemeteries Trust to provide a Flora and Fauna Assessment (FFA) to accompany a rezoning application for proposed works adjacent in Gwea Reserve (Lot 4858, D.P. 752015) and the adjacent council-owned land (Lot 7301; D.P. 1139143) (hereafter referred to collectively as the study area).

1.1 Study area

The study area (comprising of approximately 5.05 ha) is located in Randwick Local Government Area (LGA), and is bound by Military Road to the north, Prince of Wales Drive to the west, Port Botany to the south, and Eastern Suburbs Memorial Park to the East (**Figure 1**). The concept plan comprises of the majority of the study area, but excludes the foreshore.

The study area appears to have been previous used for land fill and subsequently invaded by weeds, but does include some remnant. The study area is currently zoned as RE1 – Public Recreation under the Randwick Local Environmental Plan (LEP) 2012. The planning proposal seeks to amend Schedule 1 of the LEP to add ‘cemeteries’ as an additional permitted use for the site.

1.2 Description of the project

The concept plan proposes to remove most of the vegetation within the study area to expand Eastern Suburbs Memorial Park, located adjacent to the study area. ELA understands that all vegetation, including canopy trees, are proposed to be removed from within the subject site. The indicative Landscape Masterplan also includes an access way form the subject site to the foreshore (**Figure 1** and **Figure 2**).

This report has been prepared to support a re-zoning application, and fieldwork undertaken before the commencement of the *Biodiversity Conservation Act* 2016 (BC Act). Thus a Biodiversity Development Assessment Report (BDAR) under the BC Act is likely required to accompany the final Development Application (DA) once the proposed works has been finalised.

1.3 Key Terms

The following terminology will be used in the report:

- Subject site: the area of direct impact, shown in **Figure 1** and **Figure 2**.
- Study area: the area surveyed for the proposal including those areas likely to be directly or indirectly affected by the proposal. In this assessment the ‘subject site’ and ‘study area’ are equivalent.
- Locality: the same meaning as ascribed to local population of a species or local occurrence of an ecological community.

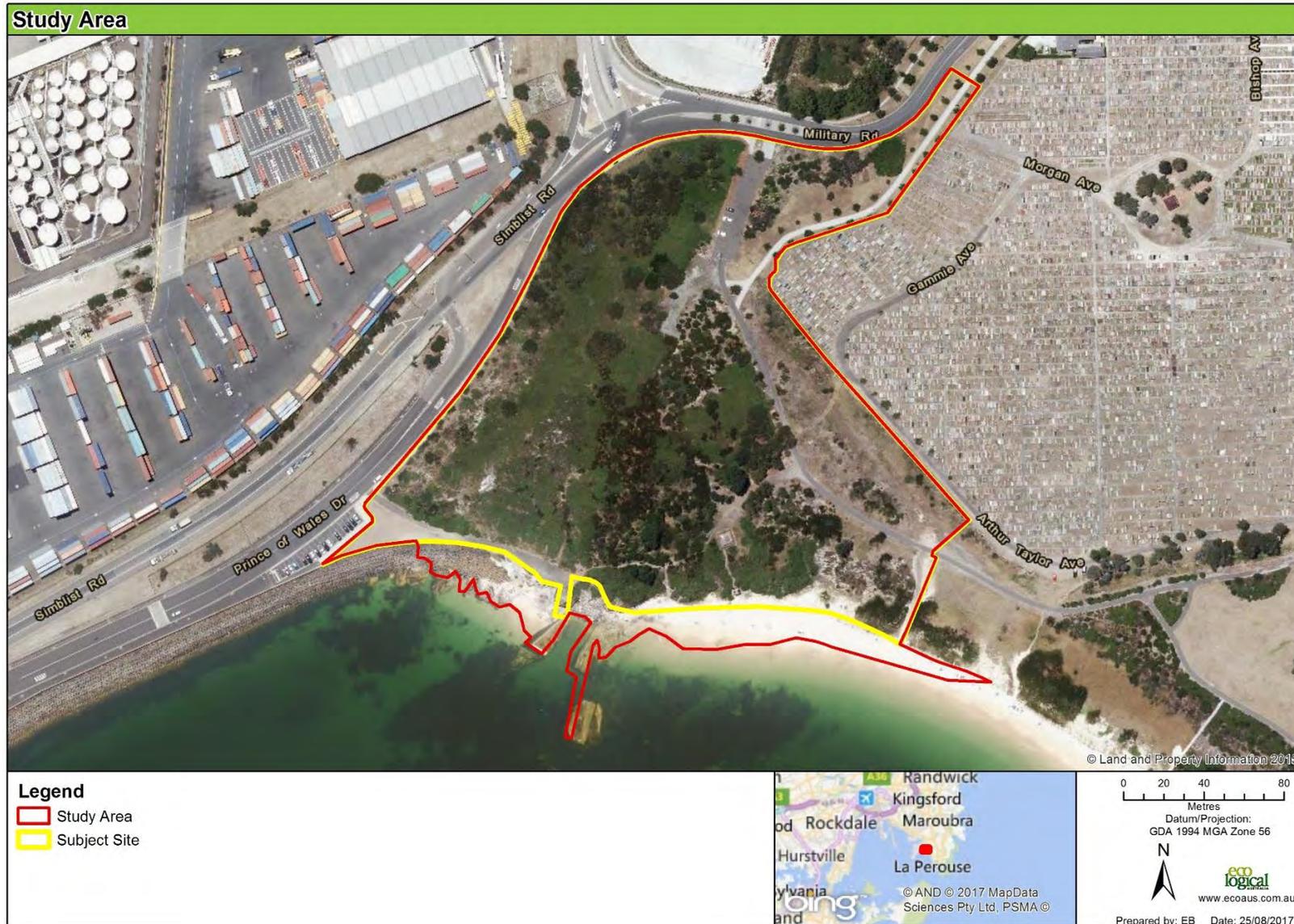


Figure 1: Study area, subject site, and regional context



Figure 2: Study area, proposed conception plan (proposed works), subject site, and study area

2 Statutory framework

2.1 *Environment Protection Biodiversity Conservation Act 1999*

The *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) is Commonwealth legislation that deals with Matters of National Environmental Significance (MNES). Impacts to MNES are assessed through application of a significance assessment. Where a development or activity has the potential to have a significant impact on a MNES, a referral is made to the Department of the Environment and Energy (DotEE). The Department determines whether the activity can proceed with no further assessment by the Commonwealth, or whether it will be a controlled action for which an Environmental Impact Assessment must be supplied. The Act also allows for Strategic Assessments which assess a policy, plan or program rather than individual developments.

2.2 *Biodiversity Conservation Act 2016*

In November 2016 the NSW parliament passed the *Biodiversity Conservation Act 2016* (BC Act). This new legislation replaced the *Threatened Species Conservation Act 1995* (TSC Act) and took effect 25 August 2017. Among other things, the BC Act introduces new requirements for biodiversity assessment and will require proponents to offset significant biodiversity impacts through the purchase and retirement of biodiversity credits. The government has recently exhibited regulations that provide further detail on the changes as well as established transitional arrangements for projects which are being assessed during the time period in which the new legislation will take effect. Transitional arrangements released on the 25 August 2017 have stated that '*Local developments [excluding select locations] will have three months from 25 August 2017 to submit a development application under the previous legislation.*'

2.3 *Environmental Planning and Assessment Act 1979*

The *Environmental Planning and Assessment Act 1979* (EP&A Act) is the principal planning legislation for NSW, providing a framework for the overall environmental planning and assessment of development proposals. The EP&A Act places a duty on the determining authority to adequately address a range of environmental matters including maintenance of biodiversity and the likely impact to threatened species, populations or ecological communities (under the TSC Act – refer below).

2.4 *Threatened Species Conservation Act 1995*

The BC Act replaced the TSC Act on 25 August 2017. The *Threatened Species Conservation Act 1995* (TSC Act), as amended, aimed to protect and encourage the recovery of threatened species, populations and communities listed under the Act. The interactions between the TSC Act and the EP&A Act requires consideration of whether a development (Part 4 of the EP&A Act), or an activity (Part 5 of the EP&A Act), is likely to significantly affect threatened species, populations, ecological communities or their habitats in accordance Section 5A of the EP&A Act (Assessments of Significance). Submission of a Species Impact Statement is required where a significant impact is considered likely to occur for threatened species, populations and/or ecological communities listed under the TSC Act.

2.5 *Biosecurity Act 2015*

On 1 July 2017 the NSW Biosecurity Act 2015 (BA 2015) repealed the NSW Noxious Weeds Act 1993. Each region in NSW now has a Regional Strategic Weed Management Plan (RSWMP) which has been developed by a Regional Weed Committee. The RSWMP identifies State-determined Priority Weeds, Regional Priority Weeds, and Weeds of Regional Concern. Under the BA Act, all private land owners,

managers, and all other people dealing with weed species have a general biosecurity duty to use appropriate measures to deal with weed species, including prevention, elimination, or minimisation of negative impacts. Land control authorities are responsible for conducting inspections and enforcing the BA Act (GSLLS 2017).

2.6 Randwick Local Environmental Plan (LEP) 2012

Under the Randwick LEP Clause 6.5 Terrestrial Biodiversity:

- (1) The objective of this clause is to maintain terrestrial biodiversity by:
 - (a) protecting native fauna and flora, and*
 - (b) protecting the ecological processes necessary for their continued existence, and*
 - (c) encouraging the conservation and recovery of native fauna and flora and their habitats.**
- (2) This clause applies to land identified as “Biodiversity” on the Terrestrial Biodiversity Map*

The study area is not located on land identified as ‘Biodiversity’.

2.7 Randwick Development Control Plan (DCP) 2012

General Controls

BR Landscaping and Biodiversity:

3.1 Existing vegetation and natural features: Explanation Significant natural features and vegetation on the site, such as rocky outcrops, cliff lines, water bodies, trees, shrubs and groundcover vegetation should be retained and incorporated into the landscape design of the development.

Objective To conserve and incorporate significant natural features and vegetation of the site as part of the landscape design.

Controls i) Maximise the retention and protection of existing vegetation including trees, shrubs and groundcover vegetation. ii) Retain and incorporate existing natural features, such as cliffs and rock outcrops into the landscape design where possible.

Note: Refer to DCP section – B5 Preservation of Trees and Vegetation for more detailed requirements on tree works. iii) Retain and stockpile topsoil for reuse in the landscaped area.

3 Methods

3.1 Literature review

A literature review was undertaken to identify the threatened species, populations and ecological communities that could potentially occur within the study area. The following documentation and mapping was reviewed:

- BioNet (Atlas of NSW Wildlife) database search (5 km) for threatened species, populations and ecological communities listed under the BC Act (OEH 2017a).
- EPBC Act Protected Matters Search Tool (5 km) for threatened and migratory species, populations and ecological communities listed under the Commonwealth EPBC Act (DotEE 2017a&b).
- Threatened flora and fauna species associated with vegetation types located within the study area
- OEH Threatened Species Profiles (OEH 2017b).
- Randwick Development Control Plan (DCP) 2012 and Randwick Local Environmental Plan (LEP) 2012
- Aerial mapping and vegetation mapping (OEH 2013), to assess the extent of vegetation including mapped threatened ecological communities (TECs) listed under the BC Act and / or EPBC Act.
- Any additional material relevant to the project.

3.1.1 Likelihood of occurrence

Aerial photography (SIXmaps and Google Earth) of the study area and surrounds were reviewed to identify the extent of vegetation cover and landscape features.

Species from the Atlas of NSW Wildlife, and Protected Matters Search Tool were combined to produce a list of threatened species that may occur within the study area (“subject species”) (**Appendix A**). The likely occurrence of threatened species, endangered populations and communities in the study area was determined based on the location of database records, the likely presence or absence of suitable habitat on the subject site, and knowledge of the species’ ecology. A list of potentially “affected species” was then identified (those that were defined as “yes”, “likely” or having “potential” to occur in the study area)

Five terms for the likelihood of occurrence of species are used in this report:

- “yes” = the species was or has been observed in the study area
- “likely” = a medium to high probability that a species uses the study area
- “potential” = suitable habitat for a species occurs in the study area, 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 study area, and
- “no” = habitat in the study area and in its vicinity is unsuitable for the species.

Following the site inspection, this list of “affect species” was refined with an understanding of the local environment and available habitat in the study area. The likelihood table in **Appendix A** reflects the final list of species and their likelihood of occurrence.

3.2 Site inspection

A site inspection was conducted by ecologists Matthew Dowle and Mitchell Scott on 17 July 2017. The site was traversed to verify the presence of native vegetation (and assigned to a Plant Community Type – PCT), threatened ecological communities, and threatened species and / or their habitat. Detailed flora and fauna assessments were not undertaken and were not considered necessary given the highly modified nature of the site.

The survey aimed to:

- validate the extent and condition of native vegetation including threatened ecological communities (TECs).
- identify the presence of threatened species or populations or their habitat.
- identify noxious weeds
- any other potential ecological constraints.

Weather conditions during the site inspection were clear (**Table 1**).

Table 1: Weather conditions during the site inspection

Date	Temperature (°C)		Rainfall (mm)	Max wind speed (km/h)
	Minimum	Maximum		
17 July 2017	7.5	19.9	0	NW 26

*Weather observations were taken from www.bom.gov.au Sydney Airport AMO (station 066037) (temperature, wind speed and rainfall)

3.3 Impact Assessment

Those threatened species, populations and threatened ecological communities known, likely or with potential to occur in the study area and be adversely affected by the proposed works (as identified in the Likelihood of Occurrence table) were subject to the NSW Assessment of Significance and / or Commonwealth Significant Impact Criteria.

These assessments are applied to help determine whether the proposed works will significantly impact these threatened entities, and are outlined in **Section 5**.

Since the commencement of the BC Act (25 August 2017), an additional BDAR report may be required to accompany the submission of a DA once the proposed works have been finalised.

3.4 Site inspection limitations

This assessment was not intended to provide an inventory of all species present across the site but instead an overall assessment of the ecological values of the site with emphasis on threatened species, endangered ecological communities and key fauna habitat features. It is important to note that some species may not have been detected on the site during the inspection as they may be cryptic or seasonal and only detectable during flowering or during breeding. In this case, the likelihood of their occurrence on site has been assessed based on the presence of potential habitat.

4 Results

4.1 Literature review

The literature review identified 16 threatened flora species and 146 threatened fauna species listed under the BC Act and / or EPBC Act, which may have the potential to occur within a 5 km radius of the study area, and / or are associated with the Plant Community Types (PCTs) present within the study area. An assessment of the likelihood of occurrence of threatened species within the study area is in **Appendix A** and was used to guide the site inspection methodology. Note, the likelihood of occurrence provided in **Appendix A** represents the assessment following the site inspection results. No threatened species have previously been recorded within the study area.

4.2 Site inspection

4.2.1 Vegetation communities

Broad scale vegetation mapping of the area has mapped the entire study area as *Coastal Sand Tea-tree Banksia Scrub* (CSTBS) (OEH 2013). This vegetation community is not listed as a Threatened Ecological Community (TEC) under the BC Act or the EPBC Act.

However, one similar vegetation community that is a TEC is located within 10 km of the study area:

- *Eastern Suburbs Banksia Scrub in the Sydney Basin Bioregion* (ESBS), listed as an *Endangered Ecological Community* (EEC) under the BC Act, and *Endangered* under the EPBC Act (also referred to as Coastal Sand Mantle Heath – OEH 2013).

Due to the composition of species within the study area, it was determined that this vegetation community was not present. However, the following vegetation communities were identified within the study area:

4.2.1.1 Coastal Sand Tea-tree Banksia Scrub (CSTBS) – PCT 771

The site inspection identified a fragment patch (approximately 1.3 ha) of remnant vegetation in the centre and north of the study area (**Figure 3, Table 2**). Dominant mid-storey species included *Banksia integrifolia* (Coastal Banksia), *Leptospermum laevigatum* (Coast Teatree), and occasional *Angophora costata* (Sydney Red Gum). Midstorey included native species *Acacia longifolia* subsp. *sophorae* (Coastal Wattle), *Acacia longifolia* subsp. *longifolia* (Sydney Golden Wattle), *Pittosporum undulatum* (Native Daphne), *Notolaea* sp., *Westringia longifolia* (Long-leaved Westringia), *Melaleuca nodosa* (Prickly-leaved Paperbark) and *Banksia ericifolia* (Heath-leaved Banksia), and exotic species *Chrysanthemoides monilifera* (Bitou Bush) and *Lantana camara* (Lantana). Ground cover included some native species including *Lomandra longifolia* (Spiny-headed Mat-rush) and *Commelina* sp. but was dominated by exotic species. These exotic species included *Bidens pilosa* (Cobblers Pegs), *Ehrharta erecta* (Panic Veldtgrass), *Brassica* sp., and *Opuntia* sp. (Prickly Pear).

Coastal Sand Tea-tree Banksia Scrub (CSTBS) (landscaped)

Within the above CSTBS is a small patch (approximately 0.1 ha) of CSTBS mapped on the northern portion of the study area (**Figure 3, Table 2**). This vegetation appeared to be landscaped with the introduction of species native to this vegetation community. Canopy species included *Banksia integrifolia*, *Allocasuarina distyla* (Scrub She-oak), *Eucalyptus* sp., and *Angophora costata*. Midstorey species included *Leptospermum laevigatum* (Coast Teatree) and *Acacia longifolia* subsp. *longifolia* (Sydney Golden Wattle). Ground cover included native species *Lomandra longifolia* and *Dianella* sp., and exotic species *Ehrharta erecta*.

4.2.1.2 Beach Spinifex Grassland – PCT 1204

A small band (approximately 3 m wide and 0.02 ha) was mapped on the south-east portion of the study area between the foreshore and the remainder of the site (**Figure 3, Table 2**). This mapped area was dominated by *Spinifex sericeus* (Hairy Spinifex).

4.2.1.3 Weeds

The locations mapped as weeds within the study area (approximately 2.04 ha in total; **Figure 3, Table 2**) were dominated by *Lantana camara* and *Chrysanthemoides monilifera*, but also included other exotic species such as *Ricinus communis* (Castor Oil Plant), *Araujia sericifera* (Moth Vine), *Cestrum parqui* (Green Cestrum), *Ipomoea cairica* (Coastal Morning Glory), *Bidens pilosa* (Cobblers Pegs), *Ehrharta erecta* (Panic Veldtgrass), *Erythrina corallodendron* (Coral Tree), and *Verbena bonariensis* (Purpletop).

4.2.1.4 Cleared area

The study area includes approximately 1.02 ha of cleared land, primarily in a strip along the eastern side of the study area adjacent to Eastern Suburbs Memorial Park (**Figure 3, Table 2**). Groundcover was dominated by exotic species including *Eragrostis curvula* (African Lovegrass). Two lines of planted *Cupaniopsis anacardioides* (Tuckeroo) occur in the north-east corner of the study area.

4.2.1.5 Natural or modified foreshore

Approximately 0.67 ha of foreshore has been mapped on the southern boundary of the study area, consisting of natural sandy beach and artificial concrete sea wall and walkways (**Figure 3, Table 2**).

4.2.1.6 Seagrass Meadows

Seagrass meadows are mapped offshore, and 0 ha occur within the study area. Approximately 2.13 ha are mapped within 1 km of the study area (**Figure 3, Table 2**).

Table 2: Vegetation communities within study area

Vegetation community	Area (ha)
Coastal Sand Tea-tree Banksia Scrub (CSTBS) – PCT 771	1.30
<i>(includes Coastal Sand Tea-tree Banksia Scrub [CSTBS] - landscaped)</i>	<i>(0.10)</i>
Beach Spinifex Grassland – PCT 1204	0.02
Weeds	2.04
Cleared area	1.02
Natural or modified foreshore	0.67
Seagrass Meadows – PCT 1913	0
Total	5.05

**Figures rounded to two decimal places*

4.2.2 Flora

A total of 29 native flora species and 29 exotic flora species were identified within the study area during the site inspection (**Appendix B**).

4.2.3 Threatened flora

No threatened flora species listed under the BC Act or EPBC Act were recorded during the site inspection and given the highly disturbed nature of the study area, it is unlikely that any threatened flora would occur.

4.3 Fauna and fauna habitat

4.3.1 Fauna habitat

The study area does not contain any drainage lines or inundations. No hollow-bearing trees were recorded within the study area during the site inspection.

The study area contains flowering species from the Myrtaceae and Proteaceae families, which are potential foraging habitat for birds and mammals, including some vagrant threatened species. These species represent foraging habitat include *Angophora costata* and *Banksia integrifolia*.

No threatened fauna species were recorded during the site inspection. However, the site may contain intermittent and / or marginal foraging habitat for some threatened fauna. Eight native fauna species and two exotic fauna species were recorded during the site inspection.

4.3.2 State and Regional Priority Weeds, and Weeds of Regional Concern

Nine (9) weeds identified in the *Greater Sydney Regional Strategic Weed Management Plan 2017* (Greater Sydney RSWMP) were recorded within the study area (**Table 3**). This includes four weeds of State-determined Priority, one weed of Regional Priority, and four weeds of Regional Concern.

All weeds recorded within the study area should be managed according to strategies outlined in GSELLS 2017.

Table 3: Greater Sydney RSWMP State and Regional Priority Weeds, and Weeds of Regional Concern, recorded within the study area

Family	Species Name	Common Name	State-determined Priority Weeds	Regional Priority Weeds	Weeds of Regional Concern
Apocynaceae	<i>Araujia sericifera</i>	Moth Vine	-	-	Yes
Solanaceae	<i>Cestrum parqui</i>	Green Cestrum	-	Yes	-
Asteraceae	<i>Chrysanthemoides monilifera</i> *	Bitou Bush	Yes	-	-
Rosaceae	<i>Cotoneaster</i> sp.	-	-	-	Yes
Poaceae	<i>Eragrostis curvula</i>	African Lovegrass	-	-	Yes
Convolvulaceae	<i>Ipomoea cairica</i>	Coastal Morning Glory	-	-	Yes
Verbenaceae	<i>Lantana camara</i>	Lantana	Yes	-	-
Cactaceae	<i>Opuntia</i> sp.	Prickly Pear	Yes	-	-
Asteraceae	<i>Senecio madagascariensis</i>	Fireweed	Yes	-	-

* Although *Chrysanthemoides monilifera* (Bitou Bush) is located within the study area, it is not located within the 'bitou bush biosecurity zone'



Figure 3: Vegetation communities mapped within the study area

5 Impact Assessment

5.1 Direct impacts

An assessment of likely direct impacts from the proposed works has been included below based on the proposed works. A summary of the likely direct impacts is outlined in **Table 4**.

Table 4: Direct impacts to vegetation communities

Vegetation community	Study area (ha)	Area to be impacted (subject site) (ha)
S_HL02: Coastal Sand Tea-tree Banksia Scrub (CSTBS) – PCT 771	1.30	1.30
<i>(includes Coastal Sand Tea-tree Banksia Scrub [CSTBS] - landscaped)</i>	(0.10)	(0.10)
S_GL01: Beach Spinifex Grassland – PCT 1204	0.02	0.02
Weeds	2.04	2.04
Cleared area	1.02	1.02
Natural or modified foreshore	0.67	0
S_SW03: Seagrass Meadows – PCT 1913	0	0
Total	5.05	4.38

**Figures rounded to two decimal places*

5.2 Indirect impacts

The proposed works have the potential to impact adjacent foreshore and marine environment. Negative impacts could include:

- increased sediment, erosion and nutrient flow
- edge effects, such as possible increase in weeds around the proposed footprint
- soil and vegetation disturbance

The management of potential indirect impacts can be more specifically detailed at the DA stage once the design is finalised.

5.3 Key threatening process

Two Key Threatening Processes (KTP) listed under Schedule 4 of the BC Act are relevant to the proposed works (OEH 2017c). These are:

- Clearing of native vegetation
- Invasion, establishment and spread of *Lantana*.

5.4 Commonwealth Significance Assessment (EPBC Act)

The EPBC Act establishes a process for assessing the environmental impact of activities and developments where “Matters of National Environmental Significance” (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 the Environment (DotE) which is responsible for administering the EPBC Act.

Specific ‘Significant Impact Criteria’ are provided for each MNES, except for threatened species and ecological communities, in which case separate criteria are provided for species listed as endangered and vulnerable under the EPBC Act.

There are no MNES or species, populations, or ecological communities listed under the EPBC Act, likely to occur within the study area. Therefore a significance assessment is not required.

5.5 Biodiversity Conservation Act 2016

It is likely that the DA submission will be outside of the transitional period for impact assessment under the previous state legislation (TSC Act). Therefore the proposed works should be assessed under the BC Act 2016 (see requirements in **Section 6**).

6 Requirements under the BC Act

The BC Act came into effect on 25 August 2017, and requires a BDAR to assess impacts on flora, fauna and vegetation communities. Transitional arrangements released on the 25 August 2017 have stated that *'Local developments [excluding select locations] will have three months from 25 August 2017 to submit a development application under the previous legislation.'* Based on the current project timeline, it is likely that a BDAR will be required for the proposed works.

6.1 Likely offset requirements

The minimum lot size map relative to the study area (within Randwick LGA) is determined by the zoning of the land. The land is currently zone RE1 – Public Recreation under the Randwick Local Environmental Plan (LEP) 2012, but is proposed to be rezoned as SP2 - Infrastructure. Neither of these zones have a minimum lot size. Thus under clause 7.2.2.b of the regulations, the minimum lot size in this case is *the actual size of the allotment of land on which the proposed development is to be carried out.* The study area is 5.05 ha (between 1 ha and 40 ha) and thus the threshold area of clearing is 0.5 ha. Therefore if 0.5 ha or greater native vegetation is cleared, offsets are required.

The conceptual plan currently would remove approximately 1.32 ha of native vegetation from within the study area (**Section 5**), and thus offsetting would be required.

Impacts under the Biodiversity Conservation Act 2016 are offset by the following options:

- purchasing and retiring a calculated number of credits relative to the impact of the proposed works
- paying money into the 'Biodiversity Fund' with a premium.

6.2 Serious and irreversible impacts (SAIL)

Under the BC Act, serious and irreversible impacts are impacts that:

- *will cause a further decline of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline, or*
- *will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size, or impact on the habitat of a species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution, or*
- *impact on a species or ecological community that is unlikely to respond to measures to improve habitat and vegetation integrity and is therefore irreplaceable.*

OEH have outlined candidate species potential species (and their habitat) that meet the SAIL principles and criteria (Appendix 2, OEH 2017d). Any threatened species or habitat component of a threatened species not listed in Appendix 2 is unlikely to meet the relevant SAIL principles. However, a decision-maker may still consider whether a species is likely to meet the relevant SAIL principles based on an assessment against the criteria (OEH 2017d).

No vegetation community, or species of flora or fauna, identified within the study area by this FFA are currently identified as a candidate for SAIL.

7 Conclusion

This report has been prepared to support a re-zoning application to be submitted by Southern Metropolitan Cemeteries Trust for the expansion of the Eastern Suburbs Memorial Park.

The following vegetation communities were recorded within the study area:

- Coastal Sand Tea-tree Banksia Scrub (CSTBS) – PCT 771
- Beach Spinifex Grassland – PCT 1204

No threatened species of flora or fauna were recorded during the site inspection.

Nine (9) weeds identified in the *Greater Sydney Regional Strategic Weed Management Plan 2017* (Greater Sydney RSWMP) were recorded within the study area, including four weeds of State-determined Priority, one weed of Regional Priority, and four weeds of Regional Concern.

The BC Act came into effect on 25 August 2017, and requires a BDAR to assess impacts on flora, fauna and vegetation communities. Transitional arrangements released on the 25 August 2017 have stated that *'Local developments [excluding select locations] will have three months from 25 August 2017 to submit a development application under the previous legislation.'* Based on the current project timeline, it is likely that a BDAR will be required for the proposed works.

The conceptual plan currently would remove approximately 1.32 ha of native vegetation from within the study area (**Section 5**), and thus offsetting under the BC Act would be required

Impacts under the Biodiversity Conservation Act 2016 are offset by the following options:

- purchasing and retiring a calculated number of credits relative to the impact of the proposed works
- paying money into the 'Biodiversity Fund' with a premium.

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Appendix A Likelihood of occurrence

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 on site and in the vicinity is unsuitable for the species.

An assessment of significance was conducted for threatened species or ecological communities that were recorded within the study area or had a higher likelihood of occurring and were not recorded during the site visit. It is noted that some threatened fauna species that are highly mobile, wide ranging and vagrant may use portions of the study area intermittently for foraging. For these fauna species, the habitat present and likely to be impacted is not considered to be important to the threatened species, particularly in relation to the amount of similar habitat remaining in the surrounding landscape. As such, an assessment of significance in reference to State or Commonwealth legislation was not considered necessary.

The records column refers to the number of records occurring within 5 km of the study area, as provided by the Atlas of NSW Wildlife (BioNet) and Protected Matters Search Tool database search.

Information provided in the habitat associations’ column has primarily been extracted (and modified) from the Commonwealth Species Profile and Threats Database (DotEE 2017a+b) and the NSW Threatened Species Profiles (OEH. 2017b).

Table 5: Likelihood of occurrence and requirement of impact assessment for threatened fauna species

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
Amphibians						
<i>Crinia tinnula</i> [^]	Wallum Froglet	V		Acidic swamps on coastal sand plains (typically in sedgelands and wet heathlands), drainage lines, and swamp sclerophyll forests.	No, no potential habitat within the study area.	No
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	V	V	Heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based.	No, no potential habitat within the study area.	No
<i>Litoria aurea</i>	Green and Golden Bell Frog	E1	V	Marshes, dams and stream-sides, particularly those containing <i>Typha</i> spp. (bullrushes) or <i>Eleocharis</i> spp. (spikerushes). Some populations occur in highly disturbed areas.	No, no potential habitat within the study area.	No
<i>Litoria brevipalmata</i> [^]	Green-thighed Frog	V		Rainforest and moist eucalypt forest to dry eucalypt forest and heath, typically in areas where surface water gathers after rain.	No, no potential habitat within the study area.	No
Aves						
<i>Actitis hypoleucos</i>	Common Sandpiper		M	Coastal wetlands and some inland wetlands, especially muddy margins or rocky shores. Also estuaries and deltas, lakes, pools, billabongs, reservoirs, dams and claypans, mangroves.	Unlikely, study area contains marginal potential habitat which would only be	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					periodically used by this species.	
<i>Anous stolidus</i>	Common Noddy		M	Marine.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Anthochaera phrygia</i> [^]	Regent Honeyeater	E4A	CE	Eucalypt woodland and open forest, wooded farmland and urban areas with mature eucalypts, and riparian forests of <i>Casuarina cunninghamiana</i> (River Oak).	No	No
<i>Apus pacificus</i>	Fork-tailed Swift		M	Riparian woodland, swamps, low scrub, heathland, saltmarsh, grassland, Spinifex sandplains, open farmland and inland and coastal sand-dunes.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Ardea alba</i>	Great Egret			Swamps and marshes, grasslands, margins of rivers and lakes, salt pans, estuarine mudflats and other wetland habitats.	Unlikely, study area contains marginal potential habitat	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					which would only be periodically used by this species.	
<i>Ardea ibis</i>	Cattle Egret			Grasslands, wooded lands and terrestrial wetlands.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Ardenna carneipes</i>	Flesh-footed Shearwater	V	M	Marine.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Ardenna grisea</i>	Sooty Shearwater		M	Islands, offshore.	Unlikely, study area contains marginal potential habitat which would	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					only be periodically used by this species.	
<i>Ardenna pacificus</i>	Wedge-tailed Shearwater			Islands, offshore.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Ardenna tenuirostris</i>	Short-tailed Shearwater		M	Islands, offshore.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Arenaria interpres</i>	Ruddy Turnstone		M	Tidal reefs and pools; pebbly, shelly and sandy shores; mudflats; inland shallow waters; sewage ponds, saltfields; ploughed ground.	Unlikely, study area contains marginal potential habitat which would only be	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					periodically used by this species.	
<i>Artamus cyanopterus cyanopterus</i> [^]	Dusky Wood Swallow	V		Sclerophyll forest, woodland, coastal scrub and wooded farmland.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E1	E	Permanent freshwater wetlands with tall, dense vegetation, particularly <i>Typha</i> spp. (bullrushes) and <i>Eleocharis</i> spp. (spikerushes).	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Calidris acuminata</i> [^]	Sharp-tailed Sandpiper		M	Shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	Unlikely, study area contains marginal potential habitat which would only be	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					periodically used by this species.	
<i>Calidris alba</i>	Sanderling	V	M	Coastal areas on low beaches of firm sand, near reefs and inlets, along tidal mudflats and lagoons; rarely recorded in near-coastal wetlands.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Calidris bairdii</i>	Baird's Sandpiper			Sandy beaches, mudflats, saltponds, sewage ponds and shores of lakes and lagoons.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Calidris canutus</i>	Red Knot		E, M	Intertidal mudflats, sandflats sheltered sandy beaches, estuaries, bays, inlets, lagoons, harbours, sandy ocean beaches, rock platforms, coral reefs, terrestrial saline wetlands near the coast, sewage ponds and saltworks. Rarely inland lakes or swamps.	Unlikely, study area contains marginal potential habitat which would only be	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					periodically used by this species.	
<i>Calidris ferruginea</i>	Curlew Sandpiper	E1	CE, M	"Littoral and estuarine habitats, including intertidal mudflats, non-tidal swamps, lakes and lagoons on the coast and sometimes inland."	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Calidris melanotos</i>	Pectoral Sandpiper		M	Shallow fresh to saline wetlands, including coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Calidris ruficollis</i>	Red-necked Stint		M	Tidal mudflats, saltmarshes, sandy and shelly beaches, saline and freshwater wetlands, saltfields, sewage ponds.	Unlikely, study area contains marginal potential habitat which would only be	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					periodically used by this species.	
<i>Calidris subminuta</i>	Long-toed Stint		M	Coastal and inland shallow wetlands, sewage ponds, tidelines, tidal mudflats.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Calidris tenuirostris</i>	Great Knot	V	CE, M	Intertidal mudflats or sandflats, including inlets, bays, harbours, estuaries and lagoons.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Calonectris leucomelas</i>	Streaked Shearwater		M	Marine.	Unlikely, study area contains marginal potential habitat which would only be	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					periodically used by this species.	
<i>Calyptorhynchus lathamii</i> [^]	Glossy Black-Cockatoo, Riverina population	E2,V		Largely restricted to hills and low ridges where suitable stands of its food plant <i>Allocasuarina verticillata</i> (Drooping Sheoak) remain.	No	No
<i>Calyptorhynchus lathamii</i>	Glossy Black-Cockatoo	V		Open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur.	No	No
<i>Charadrius bicinctus</i>	Double-banded Plover		M	Marine.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Charadrius leschenaultii</i>	Greater Sand-plover	V	V, M	Almost entirely restricted to coastal areas in NSW, mainly on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
<i>Charadrius mongolus</i>	Lesser Sand-plover	V	E, M	Almost entirely coastal in NSW, using sheltered bays, harbours and estuaries with large intertidal sandflats or mudflats, sandy beaches, coral reefs and rock platforms.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Charadrius ruficapillus</i>	Red-capped Plover			Marine.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Charadrius veredus</i>	Oriental Plover		M	Open plains, ploughed land, inland swamps, tidal mudflats, claypans, coastal marshes, grassy airfields, playing fields, lawns.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
<i>Chlidonias leucopterus</i>	White-winged Black Tern		M	Large coastal and inland wetlands, saltfields, tidal estuaries, lagoons, grassy swamps, and sewage ponds.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Circus assimilis</i> [^]	Spotted Harrier	V		Grassy open woodland, inland riparian woodland, grassland, shrub steppe, agricultural land and edges of inland wetlands.	Unlikely, there are no records within 5 km of the study area	No
<i>Cuculus optatus</i>	Oriental Cuckoo		C, J, R, Mar	Occupies rainforests, monsoon forests and vine thickets with dense vegetation and closed canopies.	Unlikely	No
<i>Cuculus saturatus</i>	Himalayan Cuckoo		C, J, R, Mar	Occupies rainforests, monsoon forests and vine thickets with dense vegetation and closed canopies	Unlikely	No
<i>Daphoenositta chrysoptera</i> [^]	Varied Sittella	V		Inhabits eucalypt forests and woodlands, mallee and Acacia woodland.	Unlikely, there are no records within 5 km of the study area	No
<i>Dasyornis brachypterus</i> [^]	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	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
<i>Diomedea antipodensis</i>	Antipodean Albatross	V	V	Marine.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Diomedea antipodensis gibsoni</i>	Antipodean Albatross	V	V	Marine.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Diomedea exulans</i>	Wandering Albatross	E1	V, M	Marine.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
<i>Diomedea gibsoni</i>	Gibson's Albatross	V	V	Marine.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Egretta sacra</i>	Eastern Reef Egret			Beaches, rocky shores, tidal rivers and inlets, mangroves, and exposed coral reefs.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Epthianura albifrons</i>	White-fronted Chat population in the Sydney Metropolitan Catchment Management Area	E2		"Saltmarsh of Newington Nature Reserve and in grassland on the northern bank of the Parramatta River.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
<i>Epthianura albifrons</i>	White-fronted Chat	V		Saltmarsh vegetation, open grasslands and sometimes low shrubs bordering wetland areas.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Esacus magnirostris</i> [^]	Beach Stone-curlew	E4A		Exclusively along the coast, on beaches, islands, reefs and in estuaries, and edges of or near mangroves.	Unlikely, there are no records within 5 km of the study area	No
<i>Fregata ariel</i>	Lesser Frigatebird		M	Marine.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Fregata minor</i>	Great Frigatebird		M	Marine.	Unlikely, study area contains marginal potential habitat which would	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					only be periodically used by this species.	
<i>Fregetta grallaria</i>	White-bellied Storm-Petrel	V	V	Marine.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Gallinago hardwickii</i>	Latham's Snipe		M	Freshwater, saline or brackish wetlands up to 2000 m above sea-level; usually freshwater swamps, flooded grasslands or heathlands.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Glossopsitta pusilla</i> [^]	Little Lorikeet	V		Dry, open eucalypt forests and woodlands, including remnant woodland patches and roadside vegetation.	Unlikely, there are no records within 5 km of the study area	No
<i>Grantiella picta</i>	Painted Honeyeater	V	V	Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests.	Unlikely, study area contains	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					marginal potential habitat which would only be periodically used by this species.	
<i>Gygis alba</i>	White Tern	V		Oceanic islands, offshore waters.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Haematopus fuliginosus</i> [^]	Sooty Oystercatcher	V		Rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Haematopus longirostris</i>	Pied Oystercatcher	E1		Intertidal flats of inlets and bays, open beaches and sandbanks.	Unlikely, study area contains marginal	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					potential habitat which would only be periodically used by this species.	
<i>Haliaeetus leucogaster</i> [^]	White-bellied Sea-Eagle	V		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, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Hieraaetus morphnoides</i> [^]	Little Eagle	V		Open eucalypt forest, woodland or open woodland, including sheoak or Acacia woodlands and riparian woodlands of interior NSW.	Unlikely, no records within 5 km of study area	No
<i>Hirundapus caudacutus</i>	White-throated Needletail		M	Occur most often over open forest and rainforest, as well as heathland, and remnant vegetation in farmland.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
<i>Hydroprogne caspia</i>	Caspian Tern		M	Coastal offshore waters, beaches, mudflats, estuaries, rivers, lakes.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Lathamus discolor</i> [^]	Swift Parrot	E1	CE	Box-ironbark forests and woodlands.	No	No
<i>Limicola falcinellus</i>	Broad-billed Sandpiper	V	M	Sheltered parts of the coast such as estuarine sandflats and mudflats, harbours, embayments, lagoons, saltmarshes and reefs.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Limosa lapponica</i> [^]	Bar-tailed Godwit		M	Intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons, bays, seagrass beds, saltmarsh, sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. Rarely inland wetlands, paddocks and airstrips.	Unlikely, study area contains marginal potential habitat which would only be	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					periodically used by this species.	
<i>Limosa limosa</i>	Black-tailed Godwit	V	M	"Usually sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats. Further inland, it can also be found around muddy lakes and swamps."	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Macronectes giganteus</i>	Southern Giant Petrel	E1	E, M	Marine.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Macronectes halli</i>	Northern Giant-Petrel	V	V, M	Marine.	Unlikely, study area contains marginal potential habitat which would only be	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					periodically used by this species.	
<i>Monarcha melanopsis</i>	Black-faced Monarch		M	Rainforest, open eucalypt forests, dry sclerophyll forests and woodlands, gullies in mountain areas or coastal foothills, Brigalow scrub, coastal scrub, mangroves, parks and gardens.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Monarcha trivirgatus</i>	Spectacled Monarch			Mountain/lowland rainforest, wooded gullies, riparian vegetation including mangroves.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Motacilla flava</i>	Yellow Wagtail		M	Swamp margins, sewage ponds, saltmarshes, playing fields, airfields, ploughed land, lawns.	No	No
<i>Myiagra cyanoleuca</i>	Satin Flycatcher		M	Eucalypt-dominated forests, especially near wetlands, watercourses, and heavily-vegetated gullies.	No	No
<i>Neochmia ruficauda</i>	Star Finch	E4	E	The Star Finch (eastern) occurs within the Desert Channels, Burdekin and Fitzroy (Queensland) Natural Resource	No, this species only occurs in	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
				Management Regions. It has been recorded from damp grasslands, sedgeland, or grassy woodlands near permanent water or areas of regular inundation. Occasionally, individuals have been reported in disturbed habitat and suburban areas.	central Queensland.	
<i>Neophema chrysogaster</i>	Orange-bellied Parrot	E4A	CE	Winter habitat is mostly within 3 km of the coast in sheltered bays, lagoons, estuaries, coastal dunes and saltmarshes. Also small islands and peninsulas, saltworks, golf courses, low samphire herbland and taller coastal shrubland.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Ninox strenua</i> [^]	Powerful Owl	V		Woodland, open sclerophyll forest, tall open wet forest and rainforest.	No	No
<i>Numenius madagascariensis</i> [^]	Eastern Curlew		CE, M	Estuaries, bays, harbours, inlets and coastal lagoons, intertidal mudflats or sandflats, ocean beaches, coral reefs, rock platforms, saltmarsh, mangroves, freshwater/brackish lakes, saltworks and sewage farms.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
<i>Numenius minutus</i>	Little Curlew		M	Dry grasslands, open woodlands, floodplains, margins of drying swamps, tidal mudflats, airfields, playing fields, crops, saltfields, sewage ponds.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Numenius phaeopus</i>	Whimbrel		M	Estuaries, mangroves, tidal flats, coral cays, exposed reefs, flooded paddocks, sewage ponds, grasslands, sports fields, lawns.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Pandion haliaetus</i> [^]	Osprey		M	Coastal areas near shallow waters.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
<i>Pezoporus wallicus wallicus</i>	Eastern Ground Parrot	V		Coastal or subcoastal low heathland and sedgeland.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Philomachus pugnax</i>	Ruff		M	Terrestrial wetlands including lakes, swamps, pools, lagoons, tidal rivers, swampy fields and floodlands. Occasionally harbours, estuaries, seashores, sewage farms and saltworks.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Phoebastria fusca</i>	Sooty Albatross	V	V, M	Marine.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
<i>Pluvialis fulva</i>	Pacific Golden Plover		M	Estuaries, mudflats, saltmarshes, mangroves, rocky reefs, inland swamps, ocean shores, paddocks, sewage ponds, ploughed land, airfields, playing fields.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Pluvialis squatarola</i>	Grey Plover		M	Mudflats, saltmarsh, tidal reefs and estuaries.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Polytelis swainsonii</i>	Superb Parrot	V	V	Box-gum woodland, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest.	No	No
<i>Procelsterna cerulea</i>	Grey Ternlet	V		Marine.	Unlikely, study area contains marginal potential habitat which would only be	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					periodically used by this species.	
<i>Pterodroma leucoptera leucoptera</i>	Gould's Petrel	V	E	"Marine. Nesting habitat is located within steeply sloping rock scree gullies with a canopy of Cabbage Tree Palms."	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Pterodroma neglecta neglecta</i>	Kermadec Petrel (west Pacific subspecies)	V	V	Marine.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Rhipidura rufifrons</i>	Rufous Fantail		M	Wet sclerophyll forests, subtropical and temperate rainforests. Sometimes drier sclerophyll forests and woodlands.	Unlikely, study area contains marginal potential habitat which would only be	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					periodically used by this species.	
<i>Rostratula australis</i>	Australian Painted Snipe	E1	E	Swamps, dams and nearby marshy areas.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Stagonopleura guttata</i>	Diamond Firetail	V		"Grassy eucalypt woodlands, open forest, mallee, Natural Temperate Grassland, secondary derived grassland, riparian areas and lightly wooded farmland."	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Stercorarius parasiticus</i>	Arctic Jaeger		M	Marine.	Unlikely, study area contains marginal potential habitat which would only be	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					periodically used by this species.	
<i>Stercorarius pomarinus</i>	Pomarine Jaeger		M	Marine.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Sterna hirundo</i>	Common Tern		M	Offshore waters, ocean beaches, estuaries, large lakes. Less commonly freshwater swamps, floodwaters, sewage farms and brackish and saline lakes.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Sternula albifrons</i> [^]	Little Tern	E1	M	Sheltered coastal environments, harbours, inlets and rivers.	Unlikely, study area contains marginal potential habitat which would only be	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					periodically used by this species.	
<i>Stictonetta naevosa</i>	Freckled Duck	V		Freshwater swamps and creeks, lakes, reservoirs, farm dams and sewage ponds.	No	No
<i>Sula leucogaster</i>	Brown Booby		M	Coastal waters, harbours and estuaries and near offshore islands.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Thalassarche cauta</i>	Shy Albatross	V	V	Marine.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Thalassarche cauta cauta</i>	Shy Albatross	V	V	Marine.	Unlikely, study area contains marginal potential habitat which would	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					only be periodically used by this species.	
<i>Thalassarche melanophris</i>	Black-browed Albatross	V	V	Marine.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Thinornis rubricollis</i> [^]	Hooded dotterel	E4A		Sandy ocean beaches, tidal bays and estuaries, rock platforms, rocky or sand-covered reefs, and small beaches in lines of cliffs. Also use near-coastal saline and freshwater lakes and lagoons.	Unlikely, there are no records within 5 km of the study area	No
<i>Tringa brevipes</i>	Grey-tailed Tattler		M	"Sheltered coasts with reefs and rock platforms or intertidal mudflats; intertidal rocky, coral or stony reefs; shores of rock, shingle, gravel or shells; embayments, estuaries and coastal lagoons; lagoons and lakes; and ponds in sewage farms and saltworks."	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Tringa glareola</i>	Wood Sandpiper		M	Well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes; inundated	Unlikely, study area contains	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
				grasslands; floodplains; irrigated crops; sewage ponds; reservoirs; large farm dams; bore drains; rarely brackish wetlands and saltmarsh.	marginal potential habitat which would only be periodically used by this species.	
<i>Tringa incana</i>	Wandering Tattler		M	Rocky coasts with reefs and platforms, offshore islands, shingle beaches or beds; occasionally coral reefs or beaches.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Tringa nebularia</i>	Common Greenshank		M	Terrestrial wetlands (swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans, saltflats, sewage farms and saltworks dams, inundated rice crops and bores) and sheltered coastal habitats (mudflats, saltmarsh, mangroves, embayments, harbours, river estuaries, deltas, lagoons, tidal pools, rock-flats and rock platforms).	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
<i>Tryngites subruficollis</i>	Buff-breasted Sandpiper			Short grasslands, freshwater or saline wetlands, tidal mudflats.	Unlikely, study area contains marginal	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
					potential habitat which would only be periodically used by this species.	
<i>Tyto novaehollandiae</i> [^]	Masked Owl	V		Dry eucalypt forests and woodlands from sea level to 1100 m.	Unlikely, no records within 5 km of study area	No
<i>Tyto tenebricosa</i> [^]	Sooty Owl	V		Dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests.	Unlikely, no records within 5 km of study area	No
<i>Xenus cinereus</i> [^]	Terek Sandpiper	V	M	Mudbanks and sandbanks near mangroves, rocky pools and reefs, and occasionally up to 10 km inland around brackish pools.	Unlikely, study area contains marginal potential habitat which would only be periodically used by this species.	No
Invertebrates						
<i>(None recorded)</i>						
Fish and other marine species						Unlikely

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
<i>Epinephelus daemeli</i>	Black Rockcod	V	V	Caves, gutters and beneath bomboras on rocky reefs. Small juveniles are often found in coastal rock pools, and larger juveniles around rocky shores in estuaries.	No	No
<i>Macquaria australasica</i>	Macquarie Perch	E1	E	River and lake habitats, especially the upper reaches of rivers and their tributaries.	No	No
<i>Prototroctes maraena</i>	Australian Grayling		V	Coastal rivers and streams, fresh and brackish coastal lagoons.	No	No
<i>Carcharias taurus</i>	Grey Nurse Shark	E4A	CE	Temperate inshore coastal waters. Key habitat sites along the coast of NSW and southern Qld generally have sandy-bottomed gutters or rocky caves and are in the vicinity of inshore rocky reefs or islands.	No	No
<i>Carcharodon carcharias</i>	Great White Shark	V	V, M	Inshore waters around rocky reefs and islands, and often near seal colonies.	No	No
<i>Rhincodon typus</i>	Whale Shark		V, M	Oceanic and coastal, tropical to warm-temperate waters. Often seen far offshore, but also comes close inshore and sometimes enters lagoons of coral atolls.	No	No
Mammals (excluding bats)						
<i>Arctocephalus forsteri</i>	New Zealand Fur-seal	V		Prefers rocky parts of islands with jumbled terrain and boulders.	No	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
<i>Arctocephalus pusillus doriferus</i>	Australian Fur-seal	V		Rocky parts of islands with flat, open terrain.	No	No
<i>Balaenoptera musculus</i>	Blue Whale	E1	E, M	Marine.	No	No
<i>Cercartetus nanus</i> [^]	Eastern Pygmy-possum	V		Rainforest, sclerophyll forest (including Box-Ironbark), woodland and heath.	Unlikely, no records within 5 km of study area	No
<i>Dasyurus maculatus maculatus</i> (SE mainland population) [^]	Spotted-tailed Quoll	V	E	Rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.	No	No
<i>Dugong dugon</i>	Dugong	E1	M	Wide shallow protected bays, wide shallow mangrove channels and in the lee of large inshore islands. Will also occupy deeper waters.	No	No
<i>Eubalaena australis</i>	Southern Right Whale	E1	E, M	Marine.	No	No
<i>Isodon obesulus obesulus</i> [^]	Southern Brown Bandicoot (eastern)	E1	E	Heath or open forest with a heathy understorey on sandy or friable soils.	Unlikely	No
<i>Megaptera novaeangliae</i>	Humpback Whale	V	V, M	Marine.	No	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
<i>Petaurus norfolcensis</i> [^]	Squirrel Glider	E2,V		Open forest, woodland and riverine forest habitats.	Unlikely, no records within 5 km of study area	No
<i>Phascolarctos cinereus</i> [^]	Koala	V	V	Eucalypt woodlands and forests.	No	No
<i>Potorous tridactylus</i> [^]	Long-nosed Potoroo	E2,V	V	Occupies a patch of heath and heathy woodland. At Cobaki, potoroos have been recorded mainly in Scribbly Gum Heathland, but also in Scribbly Gum/Swamp Mahogany Forest, Tree Broom Heath, Scribbly Gum Forest, Black She-oak Heath and Swamp Mahogany Forest.	Unlikely, no records within 5 km of study area	No
<i>Pseudomys novaehollandiae</i> [^]	New Holland Mouse		V	Open heathlands, woodlands and forests with a heathland understorey, vegetated sand dunes.	Unlikely	No
<i>Sminthopsis leucopus</i> [^]	White-footed Dunnart	V		Coastal dune vegetation, coastal forest, tussock grassland and sedgeland, heathland, woodland and forest.	Unlikely, no records within 5 km of study area	No
Mammals (microbats and fruitbats)						Unlikely
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	Wet and dry sclerophyll forests, Cyprus Pine dominated forest, woodland, sub-alpine woodland, edges of rainforests and sandstone outcrop country.	Unlikely	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
<i>Miniopterus australis</i> [^]	Little Bentwing-bat	V		Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub.	Unlikely	No
<i>Miniopterus schreibersii oceanensis</i> [^]	Eastern Bentwing-bat	V		Rainforest, wet and dry sclerophyll forest, monsoon forest, open woodland, paperbark forests and open grassland.	Unlikely	No
<i>Mormopterus norfolkensis</i> [^]	Eastern Freetail-bat	V		Dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range.	Unlikely, no records within 5 km of study area	No
<i>Myotis macropus</i> [^]	Southern Myotis	V		Foraging habitat is waterbodies (including streams, or lakes or reservoirs) and fringing areas of vegetation up to 20m.	Unlikely	No
<i>Pteropus poliocephalus</i> [^]	Grey-headed Flying-fox	V	V	Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	Unlikely	No
<i>Saccolaimus flaviventris</i> [^]	Yellow-bellied Sheath-tail-bat	V		Almost all habitats, including wet and dry sclerophyll forest, open woodland, open country, mallee, rainforests, heathland and waterbodies.	Unlikely	No
<i>Scoteanax rueppellii</i> [^]	Greater Broad-nosed Bat	V		Woodland, moist and dry eucalypt forest and rainforest.	Unlikely, no records within 5 km of study area	No
Reptiles						

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
<i>Caretta caretta</i>	Loggerhead Turtle	E1	E, M	Marine. Nesting occurs on beaches.	No	No
<i>Chelonia mydas</i>	Green Turtle	V	V, M	Marine. Nesting occurs on beaches.	No	No
<i>Dermochelys coriacea</i>	Leatherback Turtle	E1	E, M	Marine. Nesting occurs on beaches.	No	No
<i>Eretmochelys imbricata</i>	Hawksbill Turtle		V, M	Marine.	No	No
<i>Hoplocephalus bungaroides</i>	Broad-headed Snake	E1	V	Dry and wet sclerophyll forests, riverine forests, coastal heath swamps, rocky outcrops, heaths, grassy woodlands.	No	No
<i>Varanus rosenbergi</i> [^]	Rosenberg's Goanna	V		Heath, open forest and woodland.	No	No

* TSC Act: E1 = Endangered, E2 = Endangered Population, E4 = Extinct, E4A = Critically Endangered, V = Vulnerable; EPBC Act: Bonn = Listed migratory species under Bonn Convention, CD = Conservation Dependent, CE = Critically Endangered, E = Endangered, V = Vulnerable, X = Extinct; FM Act: E1 = Endangered, E2 = Endangered Population, E4 = Extinct, E4A = Critically Endangered, V = Vulnerable

**Note: Some marine and migratory species have been excluded from this Likelihood of Occurrence analysis

[^]associated with PCT type present within the study area

Table 6: Likelihood of occurrence and requirement of impact assessment for threatened flora species

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
<i>Acacia terminalis</i> subsp. <i>terminalis</i> [^]				Coastal scrub and dry sclerophyll woodland on sandy soils.	Potential	No, this conspicuous species was not detected during the site inspection
<i>Allocasuarina portuensis</i> [^]	Nielsen Park She-oak	E1	E	The original habitat is 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, there are no records within 5 km of the study area	No
<i>Caladenia tessellata</i>	Thick Lip Spider Orchid	E1	V	Grassy sclerophyll woodland on clay loam or sandy soils, or low woodland with stony soil.	No	No
<i>Callistemon linearifolius</i>	Netted Bottle Brush	V		Dry sclerophyll forest.	No	No
<i>Chamaesyce psammogeton</i> [^]	Sand Spurge	E1		Fore-dunes, pebbly strandlines and exposed headlands, often with <i>Spinifex sericeus</i> (Spinifex) and <i>Zoysia macrantha</i> (Prickly Couch).	Unlikely, there are no records within 5 km of study area	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
<i>Cryptostylis hunteriana</i>	Leafless Tongue Orchid	V	V	"Coastal heathlands, margins of coastal swamps and sedgeland, coastal forest, dry woodland, and lowland forest."	Unlikely	No
<i>Cynanchum elegans</i> [^]	White-flowered Wax Plant	E1	E	Dry rainforest; littoral rainforest; <i>Leptospermum laevigatum</i> - <i>Banksia integrifolia</i> subsp. <i>integrifolia</i> (Coastal Tea-tree– Coastal Banksia) coastal scrub; <i>Eucalyptus tereticornis</i> (Forest Red Gum) or <i>Corymbia maculata</i> (Spotted Gum) open forest and woodland; and <i>Melaleuca armillaris</i> (Bracelet Honey Myrtle) scrub.	Unlikely, there are no records within 5 km of study area	No
<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	V	V	Dry grassy woodland, on shallow soils of slopes and ridges.	No	No
<i>Galium austral</i> [^]	Tangled Bedstraw	E1		Turpentine forest and coastal Acacia shrubland in NSW. Elsewhere sand dunes, sand spits, shrubland and woodland.	Unlikely, no records within 5 km of study area	No
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	V	V	Damp places, often near streams or low-lying areas on alluvial soils.	No	No
<i>Persoonia hirsute</i> [^]	Hairy Geebung	E1	E	Sandy soils in dry sclerophyll open forest, woodland and heath on sandstone.	Unlikely, no records within 5 km of study area	No

Scientific Name	Common Name	TSC Status	EPBC Status	Habitat	Likelihood of Occurrence	Impact Assessment Required
<i>Pterostylis sp. Botany Bay</i>	Botany Bay Bearded Orchid	E1	E	"Coastal heath dominated by <i>Melaleuca nodosa</i> and <i>Baeckea imbricata</i> on skeletal sandy soils derived from sandstone."	Unlikely	No
<i>Senecio spathulatus</i>	Coast Groundsel	E1		Frontal dunes in coastal areas.	Unlikely	No
<i>Syzygium paniculatum</i> [^]	Magenta Lilly Pilly	E1	V	"Subtropical and littoral rainforest on gravels, sands, silts and clays."	No	No
<i>Thelymitra atronitida</i>	Black-hooded Sun Orchid	E4A		"At Cape Solander recorded from shallow black peaty soil in coastal heath on sandstone. In the Bago area recorded in open forest with a heathy understorey on well drained sand or clay-loam soils.	No	No
<i>Thesium australe</i>	Austral Toadflax	V	V	Grassland on coastal headlands or grassland and grassy woodland away from the coast.	No	No

*TSC Act: E1 = Endangered, E2 = Endangered Population, E4 = Extinct, E4A = Critically Endangered, V = Vulnerable; EPBC Act: M = Migratory; Mar = Marine, Bonn = Listed migratory species under Bonn Convention, CD = Conservation Dependent, CE = Critically Endangered, E = Endangered, V = Vulnerable, X = Extinct

Appendix B Flora and fauna species list

Table 7: Flora species list

Family	Species Name	Common Name	State-determined Priority Weeds	Regional Priority Weeds	Weeds of Regional Concern
Fabaceae subf. Mimosoideae	<i>Acacia falcata</i>	Hickory Wattle			
Fabaceae subf. Mimosoideae	<i>Acacia longifolia</i> subsp. <i>longifolia</i>	Sydney Golden Wattle			
Fabaceae subf. Mimosoideae	<i>Acacia longifolia</i> subsp. <i>sophorae</i>	Coastal Wattle			
Myrtaceae	<i>Acmena smithii</i>	Lilly Pilli			
Asteraceae	<i>Ageratina adenophora</i>	Crofton Weed			
Casuarinaceae	<i>Allocasuarina distyla</i>	Scrub She-oak			
Myrtaceae	<i>Angophora costata</i>	Sydney Redgum			
Apocynaceae	<i>Araujia sericifera</i> *	Moth Vine	-	-	Yes
Proteaceae	<i>Banksia ericifolia</i>	Heath-leaved Banksia			
Proteaceae	<i>Banksia integrifolia</i>	Coastal Banksia			
Asteraceae	<i>Bidens pilosa</i> *	Cobblers Pegs	-	-	-
Brassicaceae	<i>Brassica</i> sp.	-			
Phyllanthaceae	<i>Breynia oblongifolia</i>	Coffee Bush			
Bromeliaceae	<i>Bromeliad</i> sp.	Bromeliad			

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Family	Species Name	Common Name	State-determined Priority Weeds	Regional Priority Weeds	Weeds of Regional Concern
Aizoaceae	<i>Carpobrotus glaucescens</i> *	Pigface	-	-	-
Solanaceae	<i>Cestrum parqui</i> *	Green Cestrum	-	Yes	-
Asteraceae	<i>Chrysanthemoides monilifera</i> *	Bitou Bush	Yes	-	-
Commelinaceae	<i>Commelina cyanea</i>	-			
Asteraceae	<i>Conyza</i> sp.*	-	-	-	-
Rosaceae	<i>Cotoneaster</i> sp.*	-	-	-	Yes
Sapindaceae	<i>Cupaniopsis anacardioides</i>	Tuckeroo			
Poaceae	<i>Cynodon dactylon</i> *	Couch	-	-	-
Apiaceae	<i>Daucus glochidiatus</i>	Native Carrot			
Phormiaceae	<i>Dianella</i> sp.	-			
Poaceae	<i>Ehrharta erecta</i> *	Panic Veldtgrass	-	-	-
Poaceae	<i>Eragrostis curvula</i> *	African Lovegrass	-	-	Yes
Fabaceae	<i>Erythrina corallodendron</i> *	Coral Tree	-	-	-
Myrtaceae	<i>Eucalyptus</i> sp.	-			
Cyperaceae	<i>Ficinia nodosa</i>	Knobby Club-rush			
Proteaceae	<i>Hakea gibbosa</i>	Needlebush			
Brassicaceae	<i>Hirschfeldia incana</i> *	Hairy Brassica	-	-	-

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Family	Species Name	Common Name	State-determined Priority Weeds	Regional Priority Weeds	Weeds of Regional Concern
Asteraceae	<i>Hypochaeris radicata</i> *	Catsear	-	-	-
Convolvulaceae	<i>Ipomoea cairica</i> *	Coastal Morning Glory	-	-	Yes
Myrtaceae	<i>Kunzea ambigua</i>	Tick Bush			
Verbenaceae	<i>Lantana camara</i> *	Lantana	Yes	-	-
Myrtaceae	<i>Leptospermum laevigatum</i>	Coast Teatree			
Poaceae	<i>Lolium</i> sp.*	Ryegrass	-	-	-
Lomandraceae	<i>Lomandra longifolia</i>	Spiny-headed Mat-rush			
Facaceae subf. Faboideae	<i>Medicago</i> sp.*	-	-	-	-
Myrtaceae	<i>Melaleuca nodosa</i>	Prickly-leaved Paperbark			
Poaceae	<i>Melenus</i> sp.*				
Oleaceae	<i>Notolaea</i> sp.	-			
Cactaceae	<i>Opuntia</i> sp.*	Prickly Pear	Yes	-	-
Oxalidaceae	<i>Oxalis</i> sp.*	-			
Pittosporaceae	<i>Pittosporum undulatum</i>	Native Daphne			
Plantaginaceae	<i>Plantago lanceolata</i> *	Lamb's Tongues	-	-	-
Euphorbiaceae	<i>Ricinus communis</i> *	Castor Oil Plant	-	-	-
Asteraceae	<i>Senecio madagascariensis</i> *	Fireweed	Yes	-	-

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Family	Species Name	Common Name	State-determined Priority Weeds	Regional Priority Weeds	Weeds of Regional Concern
Poaceae	<i>Setaria parviflora</i> *	-	-	-	-
Asteraceae	<i>Sonchus oleraceus</i> *	Common Sowthistle	-	-	-
Poaceae	<i>Spinifex sericeus</i>	Hairy Spinifex			
Poaceae	<i>Sporobolous africanus</i> *	Parramatta Grass	-	-	-
Caryophyllaceae	<i>Stellaria media</i> *	Chickweed	-	-	-
Asteraceae	<i>Taraxacum</i> sp.*	-	-	-	-
Aizoaceae	<i>Tetragonia tetragonoides</i>	Native Spinach			
Fabaceae subf. Faboideae	<i>Trifolium</i> sp.*	-	-	-	-
Verbenaceae	<i>Verbena bonariensis</i> *	Purpletop	-	-	-
Lamiaceae	<i>Westringia longifolia</i>	Long-leaved Westringia			

*Introduced species

Table 8: Fauna species list

Family	Species Name	Common Name
Sturnidae	<i>Acridotheres tristis</i> *	Common Myna
Meliphagidae	<i>Anthochaera carunculata</i>	Red Wattlebird
Cacatuidae	<i>Calyptorhynchus funereus</i>	Yellow-tailed Black Cockatoo
Laridae	<i>Chroicocephalus novaehollandiae</i>	Silver Gull
Campephagidae	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike
Maluridae	<i>Malurus cyaneus</i>	Super Fairywren
Estrildidae	<i>Neochmia temporalis</i>	Red-browed Finch
Phalacrocoracidae	<i>Phalacrocorax varius</i>	Pied Cormorant
Rhipiduridae	<i>Rhipidura leucophrys</i>	Willy Wagtail
Sturnidae	<i>Sturnus vulgaris</i> *	Starling

**Introduced species*

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From: Scott, Mitchell
To: [Kate Ryan](#)
Subject: Re: Bumbora Point planning proposal - Botany Cemetery
Date: Friday, 25 May 2018 1:55:56 PM
Attachments: [image012.png](#)
[image013.png](#)
[image014.png](#)
[image015.png](#)
[image016.png](#)
[image002.png](#)
[image004.png](#)
[image006.png](#)
[image008.png](#)
[image010.png](#)

Hi Katie,

In the Flora and Fauna Report (ELA 2017), we determined the Likelihood of Occurrence of Grey-headed Flying-fox within the study area as 'Unlikely' to occur. According to BioNet, GHFF has not been recorded within the study area. The nearest record is approximately 850 m to the north of the study area (OEH 2018).

Although potential foraging habitat species (specifically *Banksia integrifolia*) occur within the study area, these are of low quantity and quality (generally of low canopy height), and thus are unlikely to be utilized by GHFF regularly for foraging.

Our definition of Unlikely is 'a very low to low probability that a species uses the site', thus we are not determining that GHFF would never be found on the site.

We also note that whether the GHFF is considered 'unlikely' or 'potential' to occur will not change the nature of any future impact assessment, as GHFF is solely an ecosystem credit species (and not a species credit species), so impacts to this species under the BC Act are assessed via impacts to their associated Plant Community Types (PCTs).

According to the National Flying-fox monitoring viewer (DoeT 2018), the nearest GHFF camp is approximately 7 km to the north-east of the study area. No camps have been recorded within the study area by the monitoring project in the past (DotE 2018). Therefore GHFF does not currently utilize the study area for roosting. Therefore any proposed works within the study area are unlikely to cause a significant impact to this species under the EPBC Act, as no important populations (GHFF camps) occur within the study area.

Please get in touch with any further questions on the Flora and Fauna Assessment,

Kind regards,

Mitchell

References

Department of the Environment (DotE) 2018. National Flying-fox monitoring viewer. Available at <http://www.environment.gov.au/webgis-framework/apps/ffc-wide/ffc-wide.jsf> (accessed 25 May 2018). Australian Government.

Eco Logical Australia (ELA) 2017. Proposed Extension of Existing Cemetery, Eastern Suburbs Memorial Park, Matraville – Flora and Fauna Assessment. Prepared for Southern Metropolitan Cemeteries Trust.

Office of Environment and Heritage (OEH) 2018. BioNET - Atlas of NSW Wildlife. Available at <http://www.bionet.nsw.gov.au/>. Accessed 25 May 2018. NSW Government.

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From: Kate Ryan <kvryan@urbis.com.au>
Sent: Friday, 25 May 2018 12:50:30 PM
To: Scott, Mitchell
Subject: RE: Bumbora Point planning proposal - Botany Cemetery

Great, thanks very much!

KATE RYAN

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From: Scott, Mitchell [mailto:Michells@ecoaus.com.au]
Sent: Friday, 25 May 2018 12:47 PM
To: Kate Ryan <kvryan@urbis.com.au>
Subject: Re: Bumbora Point planning proposal - Botany Cemetery

Thanks Kate,

Confirming I received this email, and will get back to you shortly,

Mitchell

Mitchell Scott
Ecologist

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From: Kate Ryan <kvryan@urbis.com.au>
Sent: Friday, 25 May 2018 12:02:04 PM
To: Scott, Mitchell
Subject: Bumbora Point planning proposal - Botany Cemetery

Hi Mitchell,

Thanks for your time over the phone just now.

As discussed, we have received the following comment from Council in relation to a flying fox species:

- Further comment/ investigation is required to ascertain whether Grey-headed Flying-fox utilises this site for foraging and roosting. Recent observations have located the species within close proximity to the site, and *Eucalyptus robusta* and *Banksia integrifolia* (locally common and occurring on site), are suitable habitat for the Grey-headed Flying-fox.

Can you please have a look into this and let me know what is required in terms of responding to this comment?

I've attached your original report.