



total earth care

## Job No. J14098

Date: 1/02/2023

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To	Care of	Site Name
Turf One Pty Ltd PO Box 437 Somerton VIC 3062	Ku-ring-gai Council Locked Bag 1056 Pymble NSW 2073	Norman Griffiths Oval 30 Lofberg Road West Pymble NSW 2073

Total Earth Care has been commissioned by Turf One Pty Ltd, care of Ku-ring-gai Council, to prepare this letter Flora and Fauna Impact Assessment (FFIA) for the proposed stormwater mitigation works and synthetic football field at Norman Griffiths Oval, Pymble NSW 2073. This letter FFIA aims to address the mandatory ecological impact assessment requirements for activities subject to Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and will supplement the Review of Environmental Factors (REF) for the Proposal.

## 1 Introduction

The Proposal involves the development of a synthetic playing field and stormwater mitigation works at Norman Griffiths Oval, Pymble NSW 2073 (Lot 6/-/DP 564939). This will involve the following key components:

- Removal and replacement of one tree
- Minor demolition and earthworks
- Construction of a stormwater mitigation system including:
  - Continuous Deflective Separation Unit
  - Stormtech Trench and Chamber System for below ground on-site detention at 2.4 mega litre capacity
  - Bioretention basin
- Construction of new synthetic playing field
- Closure of one sewer pit
- Ancillary landscaping, lighting and fencing.

The Subject Site consists of the area directly impacted by the Proposal, while the Survey Area comprises the Subject Site in addition to the surrounding land which may be potentially indirectly impacted by the Proposal (Figure 1).



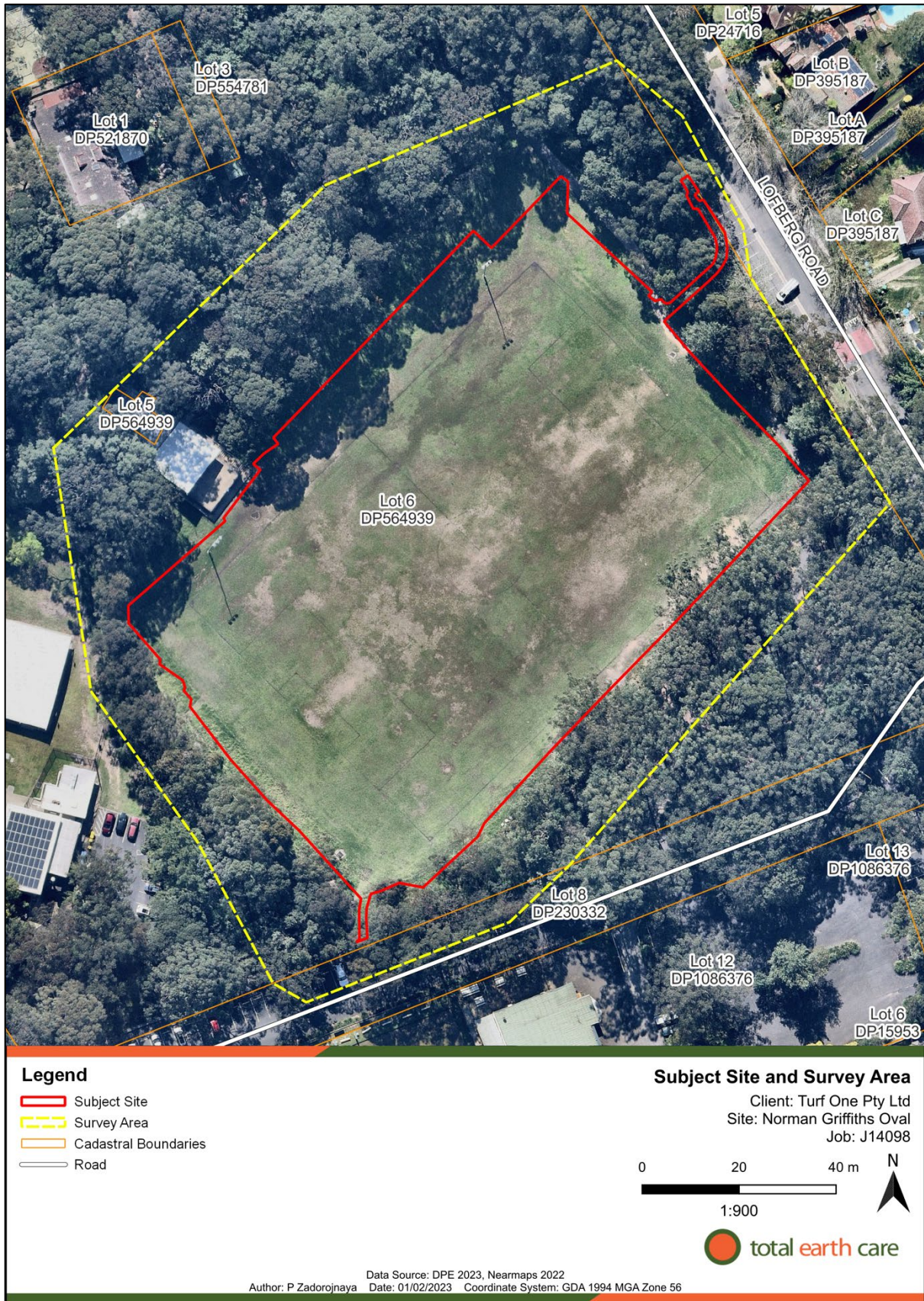


Figure 1. Subject Site and Survey Area.



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## 2 Methodology

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### 2.1 Desktop Research

A preliminary desktop study was conducted to assess the likelihood of the Subject Site to support threatened species, populations or Threatened Ecological Communities (TECs), or their habitats. All records of threatened species and populations within 5km of the Subject Site (10 km locality search) were obtained from the Department of Planning and Environment (DPE) Bionet Atlas Database (DPE, 2022a), and the Federal Protected Matters Search Tool (DCCEEW, 2022a).

Other sources of data were reviewed including:

- Historical vegetation mapping (DPE, 2022h) used to determine the likelihood of any nearby areas of endangered ecological communities
- Soil type mapping (DPE, 2022g)
- Biodiversity Offset Scheme Entry Threshold Map (DPE, 2022b)
- National Flying-fox monitoring viewer (DCCEEW, 2022b).

### 2.2 Ecological Site Assessment

A diurnal ecological site assessment was conducted over one day on Tuesday the 20<sup>th</sup> of December 2022. This involved ground-truthing of vegetation communities and targeted surveys for threatened flora, fauna and their habitats.

### 2.3 Limitations

As the surveys were undertaken at a discrete time of the year and during the day, it is possible that some species that may utilise the Subject Site were not recorded (i.e. migratory species, species present in soil bank, nocturnal species).

As stated by the DEC (2004) 'The absence of a species from survey data does not necessarily mean it does not inhabit the survey area. It may simply mean that the species was not detected at that time with the survey method adopted and the prevailing seasonal or climatic conditions.' Therefore, the relative brevity of the survey and its timing mean that the full spectrum of fauna species and ecological processes likely to occur on the Subject Site cannot be fully quantified or described in this report.

These limitations have been partly addressed by identifying potential habitats for fauna species and assessing the potential for these species to occur on the site based on previous records, the type and condition of habitats present, the land use throughout the Subject Site, Survey Area and the landscape context.

All spatial data collected used a hand-held GPS which is accurate to 5m.

## 3 Existing Environment

### 3.1 Vegetation Communities

#### 3.1.1 Historically Mapped Vegetation Communities

The Survey Area contains one historically mapped Plant Community Type (PCT) as per the NSW State Vegetation Type Map (DPE, 2022d) - PCT 3262: Sydney Turpentine Ironbark Forest (Figure 4).

#### 3.1.2 Ground-truthed Vegetation Communities

The ecological site assessment confirmed that the Survey Area contained remnant PCT 3262, along with exotic dominant lawn within and surrounding the oval (Figure 5). Plant Community Type 3262 occurred in varying condition, with good-condition vegetation occurring in the northern extent of the Survey Area, with a remnant canopy, shrub and groundcover layer and minor exotic species. Lower condition PCT 3262 occurred to the east, west and south which contained a disturbed shrub and groundcover layer with a moderate abundance of exotic species.

##### 3.1.2.1 Plant Community Type 3262

Plant Community Type 3262 comprised a remnant canopy dominated by *Syncarpia glomulifera* (Turpentine), *Angophora costata* (Sydney Red Gum), *Eucalyptus pilularis* (Blackbutt) and *E. paniculata* (Grey Ironbark). The commonly cultivated *Melia azedarach* (White Cedar) was present within the eastern extent, bordering Loftberg Road. The shrub layer was dominated by *Acacia parramattensis* (Parramatta Wattle), *Allocasuarina littoralis* (Black She-oak), *Pittosporum undulatum* (Sweet Pittosporum) and *Breynia oblongifolia* (Coffee Bush). The groundlayer was relatively sparse, dominated by *Lomandra longifolia* (Spiny-headed Mat-rush), *Microlaena stipoides* (Weeping Grass) and *Entolasia stricta* (Wiry Panic). A representative photo of PCT 3262 identified within the Survey Area is provided in Figure 2.

Minor occurrences of weeds were present within the northern extent, increasing in abundance within the eastern, western and southern patches of PCT 3262. This included common environmental weeds such as *Plantago lanceolata* (Plantain), *Ehrharta erecta* (Panic Veldtgrass), *Paspalum dilatatum* (Paspalum), *Bidens pilosa* (Cobbler's Pegs) and *Sida rhombifolia* (Paddy's Lucerne).

Small areas of the Subject Site intersect with the mapped PCT 3262 (Figure 5), however only one native species is rooted in this area: the historically cultivated *Melia azedarach* (White Cedar).



Figure 2. PCT 3262 identified within the Survey Area.



### 3.1.2.2 Exotic Dominant Lawn

The majority of the Survey Area comprised an exotic dominant lawn typical of an urban oval environment. This included the exotic lawn species *Cenchrus clandestinus* (Kikuyu), *Stenotaphrum secundatum* (Buffalo Grass) and the common native lawn grass, *Cynodon dactylon* (Couch). Other exotic species identified in less abundance include *Plantago lanceolata* (Plantain), *Trifolium repens* (White Clover) and *Modiola caroliniana* (Red-flowered Mallow). No native species representative of the locally occurring PCT 3262 were identified, therefore this vegetation has been classified as exotic dominant lawn (Figure 5). A representative photo of the exotic dominant lawn identified within the Survey Area is provided in Figure 3.



**Figure 3. Exotic dominant lawn identified within the Survey Area.**

### 3.1.3 Threatened Ecological Communities

Plant Community Type 3262 is associated with the *Biodiversity Conservation Act 2016* (BC Act) listed Critically Endangered Ecological Community (CEEC), Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion (STIF). The vegetation identified as PCT 3262 within the Survey Area was found to conform to the BC Act listing of STIF as it comprised numerous representative species, as well as occurring on the appropriate geology and landscape position as listed in the final determination (NSW Threatened Species Scientific Committee, 2019).

This PCT is also associated with the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed Critically Endangered, Turpentine-Ironbark Forest of the Sydney Basin Bioregion. The vegetation identified as PCT 3262 within the Survey Area was found to conform to this EPBC Act listing as it occurs in the Ku-ring-gai Local Government Area, and fits the following condition classes as outlined in the Listing Advice (Threatened Species Scientific Committee, 2005):

- The vegetation contains some characteristic components from all structural layers (tree canopy, small tree/shrub midstorey, and understorey).
- Tree canopy cover is greater than 10% and remnant size is greater than one hectare. These areas have the greatest conservation value and their high quality and size makes them most resilient to disturbance.
- However, remnants with tree canopy cover less than 10% are also included in the ecological community, if the fragments are greater than one hectare in size and occur in areas of native vegetation in excess of 5 hectares in area. These areas enhance the potential for connectivity and viability of the ecological community. They support native flora and fauna species by facilitating gene flow among remnants and buffering against disturbance.

Plant Community Type 3262 within the Survey Area contained characteristic components from all strata layers, has a canopy cover greater than 10%, and connects with a remnant patch greater than 1ha in size.



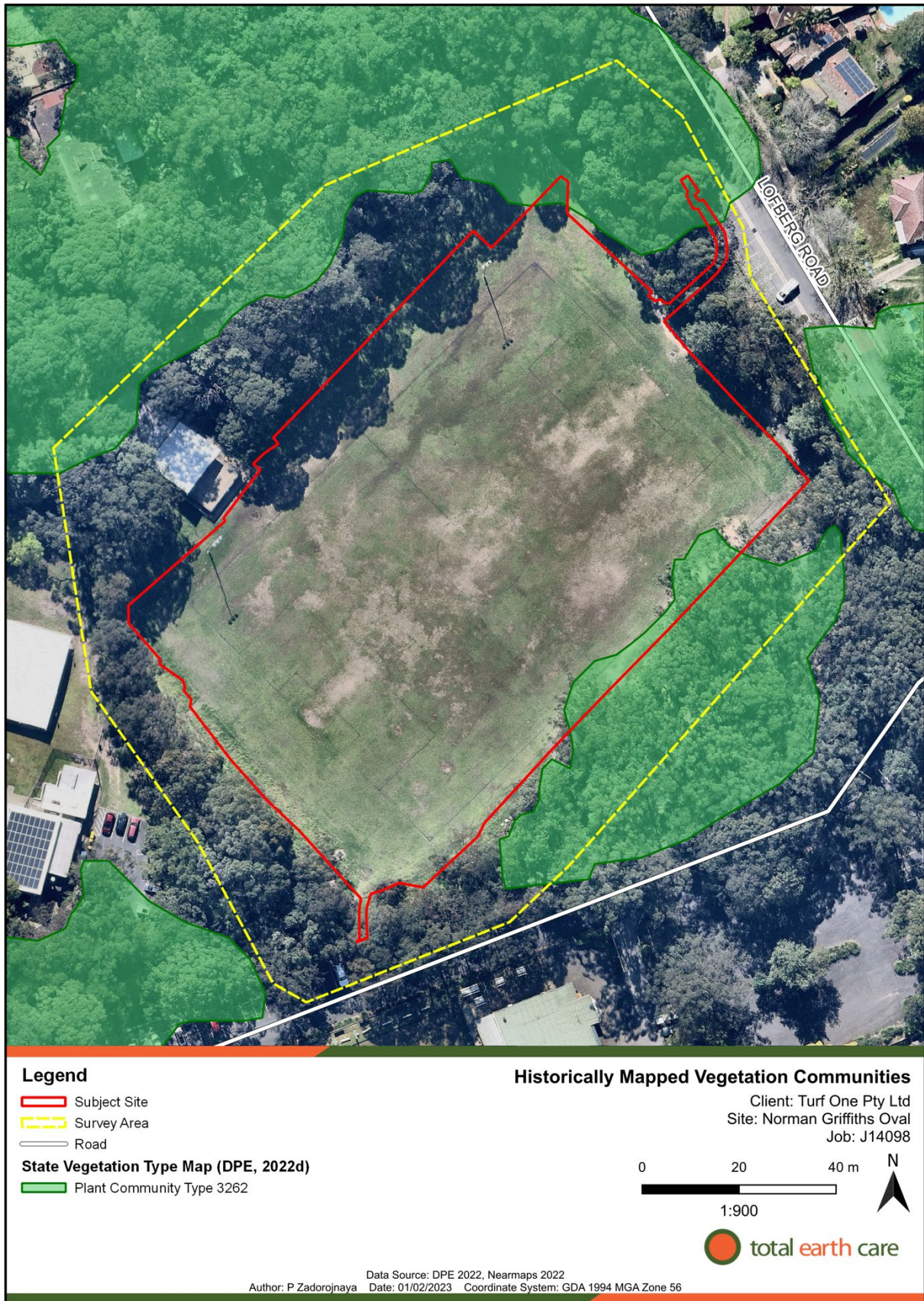


Figure 4. Historically Mapped Vegetation Communities.





Figure 5. Ground-truthed Vegetation Communities.



## 3.2 Flora

A total of 70 flora species were recorded within the Survey Area during the ecological site assessment, 51 of which are native and 19 exotic. All recorded flora species are listed in Appendix B.

### 3.2.1 Threatened Flora

The BioNet Atlas (DPE, 2022a) identified 29 threatened flora species historically recorded within 5km of the Subject Site. The EPBC Protected Matters Search Tool Report (DCCEEW, 2022a) identified an additional 15 threatened flora species previously recorded within a 5km radius of the Subject Site or which may have habitat nearby (Table 1).

No threatened flora were identified within the Survey Area. One threatened flora species may potentially occur within the Survey Area, *Thelymitra atronitida* (Black-hooded Sun Orchid) which is listed as Critically Endangered under the BC Act. The previously recorded location of this species is displayed in Figure 7. Although targeted surveys were undertaken within the Survey Area in the DPE approved survey period for this species (November-December), the site assessment was conducted relatively late in this period and could have missed the critical flowering period for this threatened orchid. As such, this species could not be excluded from the Survey Area.

**Table 1. Threatened flora species previously recorded or with potential habitat within 5km of the Subject Site**

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Source	No. of records
<i>Acacia bynoeana</i>	Bynoe's Wattle	E1	V	BioNet & PMST	2
<i>Acacia clunies-rossiae</i>	Kanangra Wattle	V		BioNet	1
<i>Acacia pubescens</i>	Downy Wattle	V	V	BioNet & PMST	2
<i>Acacia terminalis</i> subsp. <i>Eastern Sydney</i>	Sunshine wattle	E1	E	BioNet & PMST	1
<i>Allocasuarina glareicola</i>			E	PMST	0
<i>Asterolasia elegans</i>			E	PMST	0
<i>Caladenia tessellata</i>	Thick-lipped Spider-orchid, Daddy Long-legs		V	PMST	0
<i>Callistemon linearifolius</i>	Netted Bottle Brush	V,3		BioNet	14
<i>Cryptostylis hunteriana</i>	Leafless Tongue-orchid		V	PMST	0
<i>Cynanchum elegans</i>	White-flowered Wax Plant		E	PMST	0
<i>Darwinia biflora</i>		V	V	BioNet & PMST	419
<i>Darwinia peduncularis</i>		V		BioNet	1
<i>Deyeuxia appressa</i>		E1	E	BioNet & PMST	3
<i>Epacris purpurascens</i> var. <i>purpurascens</i>		V		BioNet	36
<i>Epacris sparsa</i>			E	PMST	0
<i>Eucalyptus camfieldii</i>	Camfield's Stringybark	V	V	BioNet & PMST	8
<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	V	V	BioNet	3
<i>Genoplesium baueri</i>	Bauer's Midge Orchid	E1,P,2	E	BioNet & PMST	7
<i>Grammitis stenophylla</i>	Narrow-leaf Finger Fern	E1,3		BioNet	5
<i>Grevillea juniperina</i> subsp. <i>juniperina</i>	Juniper-leaved Grevillea	V		BioNet	1
<i>Haloragodendron lucasii</i>		E1	E	BioNet & PMST	18
<i>Hibbertia spanantha</i>	Julian's Hibbertia	E4A,2	CE	BioNet & PMST	6



Scientific Name	Common Name	BC Act Status	EPBC Act Status	Source	No. of records
<i>Lasiopetalum joyceae</i>		V	V	BioNet & PMST	1
<i>Leptospermum deanei</i>		V	V	BioNet & PMST	13
<i>Macadamia integrifolia</i>	Macadamia Nut		V	BioNet	14
<i>Macadamia tetraphylla</i>	Rough-shelled Bush Nut	V	V	BioNet	1
<i>Melaleuca biconvexa</i>	Biconvex Paperbark		V	PMST	0
<i>Melaleuca deanei</i>	Deane's Paperbark	V	V	BioNet & PMST	32
<i>Persicaria elatior</i>	Knotweed, Tall Knotweed		V	PMST	0
<i>Persoonia hirsuta</i>	Hairy Geebung	E1,P,3	E	BioNet & PMST	2
<i>Persoonia mollis</i> subsp. <i>maxima</i>			E	PMST	0
<i>Pimelea curviflora</i> var. <i>curviflora</i>		V	V	BioNet & PMST	11
<i>Pimelea spicata</i>	Spiked Rice-flower		E	PMST	0
<i>Pomaderris brunnea</i>	Rufous Pomaderris, Brown Pomaderris		V	PMST	0
<i>Prostanthera densa</i>	Villous Mintbush		V	PMST	0
<i>Prostanthera junonis</i>	Somersby Mintbush		E	PMST	0
<i>Prostanthera marifolia</i>	Seaforth Mintbush	E4A,3	CE	BioNet & PMST	2
<i>Rhizanthella slateri</i>	Eastern Australian Underground Orchid	V,P,2	E	BioNet & PMST	1
<i>Rhodamnia rubescens</i>	Scrub Turpentine	E4A	CE	BioNet & PMST	7
<i>Rhodomyrtus psidioides</i>	Native Guava		CE	PMST	0
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	E1	V	BioNet & PMST	34
<i>Tetratheca glandulosa</i>		V		BioNet	42
<i>Thelymitra atronitida</i>	Black-hooded Sun Orchid	E4A,P,2		BioNet	1
<i>Thesium australe</i>	Austral Toadflax, Toadflax		V	PMST	0

BC Act Status: V – Vulnerable, E1 - Endangered, E4A - Critically Endangered, P – Protected, 2 – Category 2 sensitive species, 3 - Category 3 sensitive species

EPBC Act Status: CE - Critically Endangered, E – Endangered, V – Vulnerable.

### 3.2.2 Threatened Flora Habitat

Potential habitat for the Black-hooded Sun Orchid occurs within the good-condition PCT 3262 vegetation occurring north of the Subject Site (Figure 7). Given the dominance of exotic lawn within the Subject Site and its frequent human-use, the potential for threatened flora species within the Subject Site is considered extremely low.

### 3.2.3 Weeds

Two exotic species identified within the Survey Area are listed as Weeds of National Environmental Significance (WoNS) and/or Priority Weeds for the Greater Sydney Region:

- *Asparagus aethiopicus* (Ground Asparagus) – WoNS and Priority Weed
- *Olea europaea* subsp. *cuspidata* (African Olive) – Priority Weed.

These weed species require management under the *Biosecurity Act 2015*.



### 3.3 Fauna

Eight fauna species were recorded during the ecological site assessment, including seven native species and one introduced Rabbit. All recorded fauna species are listed in Appendix C.

#### 3.3.1 Threatened Fauna

The BioNet Atlas (DPE, 2022a) identified 40 threatened fauna species historically recorded within 5km of the Subject Site. The EPBC Protected Matters Search Tool Report (DCCEEW, 2022a) identified an additional eight threatened fauna species previously recorded within a 5km radius of the Subject Site or which may have habitat nearby (Table 2).

No threatened fauna species were identified during the ecological site assessment, however three historical records of the BC Act listed Vulnerable, Large Bent-winged Bat (*Miniopterus orianae oceanensis*) occur within the Survey Area (Figure 7).

**Table 2. Threatened fauna species previously recorded or with potential habitat within 5km of the Subject Site**

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Source	No. of records
<i>Anthochaera phrygia</i>	Regent Honeyeater	E4A,P	CE	BioNet & PMST	6
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	V,P		BioNet	11
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V,P,3	E	BioNet & PMST	95
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V,P,2	V	BioNet & PMST	6
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V,P		BioNet	25
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V,P	V	BioNet & PMST	4
<i>Cuculus optatus</i>	Oriental Cuckoo	P	C,J,K	BioNet	4
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V,P		BioNet	2
<i>Dasyornis brachypterus</i>	Eastern Bristlebird		E	PMST	0
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V,P	E	BioNet & PMST	2
<i>Falco hypoleucos</i>	Grey Falcon		V	PMST	0
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V,P		BioNet	10
<i>Glossopsitta pusilla</i>	Little Lorikeet	V,P		BioNet	12
<i>Grantiella picta</i>	Painted Honeyeater		V	PMST	0
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V,P		BioNet	15
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	V,P	V	BioNet & PMST	2
<i>Hieraaetus morphnoides</i>	Little Eagle	V,P		BioNet	6
<i>Hirundapus caudacutus</i>	White-throated Needletail	P	V,C,J,K	BioNet & PMST	36
<i>Hoplocephalus bungaroides</i>	Broad-headed Snake		V	PMST	0
<i>Isoodon obesulus obesulus</i>	Southern Brown Bandicoot (eastern)		E	PMST	0
<i>Ixobrychus flavicollis</i>	Black Bittern	V,P		BioNet	7
<i>Lathamus discolor</i>	Swift Parrot	E1,P	CE	BioNet & PMST	18
<i>Litoria aurea</i>	Green and Golden Bell Frog	E1,P	V	BioNet & PMST	6
<i>Lophoictinia isura</i>	Square-tailed Kite	V,P,3		BioNet	10
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	V,P		BioNet	21
<i>Miniopterus australis</i>	Little Bent-winged Bat	V,P		BioNet	67



Scientific Name	Common Name	BC Act Status	EPBC Act Status	Source	No. of records
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	V,P		BioNet	199
<i>Mixophyes balbus</i>	Stuttering Frog, Southern Barred Frog (in Victoria)		V	PMST	0
<i>Myotis macropus</i>	Southern Myotis	V,P		BioNet	19
<i>Neophema pulchella</i>	Turquoise Parrot	V,P,3		BioNet	1
<i>Ninox connivens</i>	Barking Owl	V,P,3		BioNet	7
<i>Ninox strenua</i>	Powerful Owl	V,P,3		BioNet	900
<i>Notamacropus parma</i>	Parma Wallaby		V	PMST	0
<i>Pandion cristatus</i>	Eastern Osprey	V,P,3		BioNet	8
<i>Petauroides volans</i>	Greater Glider	E1,P	E	BioNet & PMST	2
<i>Petaurus australis</i>	Yellow-bellied Glider	V,P	V	BioNet & PMST	1
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby		V	PMST	0
<i>Petroica boodang</i>	Scarlet Robin	V,P		BioNet	3
<i>Phascolarctos cinereus</i>	Koala	E1,P	E	BioNet & PMST	3
<i>Polytelis swainsonii</i>	Superb Parrot	V,P,3	V	BioNet	1
<i>Pommerhelix duralensis</i>	Dural Land Snail	E1	E	BioNet & PMST	3
<i>Pseudomys novaehollandiae</i>	New Holland Mouse, Pookila		V	PMST	0
<i>Pseudophryne australis</i>	Red-crowned Toadlet	V,P		BioNet	68
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V,P	V	BioNet & PMST	1,342
<i>Ptilinopus superbus</i>	Superb Fruit-Dove	V,P		BioNet	6
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V,P		BioNet	14
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V,P		BioNet	15
<i>Tyto novaehollandiae</i>	Masked Owl	V,P,3		BioNet	2
<i>Varanus rosenbergi</i>	Rosenberg's Goanna	V,P		BioNet	4

BC Act Status – V – Vulnerable, E1 Endangered, E4A - Critically Endangered, P – Protected, 2 – Category 2 sensitive species, 3 - Category 3 sensitive species

EPBC Act Status - CE - Critically Endangered, E – Endangered, V – Vulnerable, C – Camba, J – Jamba, K – Rokamba

### 3.3.2 Threatened Fauna Habitat

The remnant vegetation within the greater Survey Area comprises mature canopy species which may provide foraging habitat for local fauna, as well as shelter and breeding habitat within small hollows and decorticated bark.

The box culvert in the eastern extent of the Subject Site (Figure 6 and Figure 7), may provide potential roosting habitat for the following locally occurring Microbats:

- Eastern Coastal Free-tailed Bat (*Miconomus norfolkensis*) – Vulnerable under the BC Act
- Little Bent-winged Bat (*Miniopterus australis*) – Vulnerable under the BC Act
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*) – Vulnerable under the BC Act
- Southern Myotis (*Myotis macropus*) – Vulnerable under the BC Act.

The Box Culvert is not suitable breeding habitat for microbat species due to its size and shape.

Given the dominance of exotic lawn within the Subject Site, it is largely void of potential fauna foraging or breeding habitat such as aquatic habitats, nectar/pollen/fruit-bearing trees and shrubs and habitat trees. Only one (1) tree occurs within the Subject Site, the historically cultivated *Melia azedarach* (White Cedar), however this tree is unlikely to provide more than sporadic potential foraging habitat.





**Figure 6. Box culvert identified within the eastern extent of the Subject Site which may provide potential roosting habitat for Microbats.**



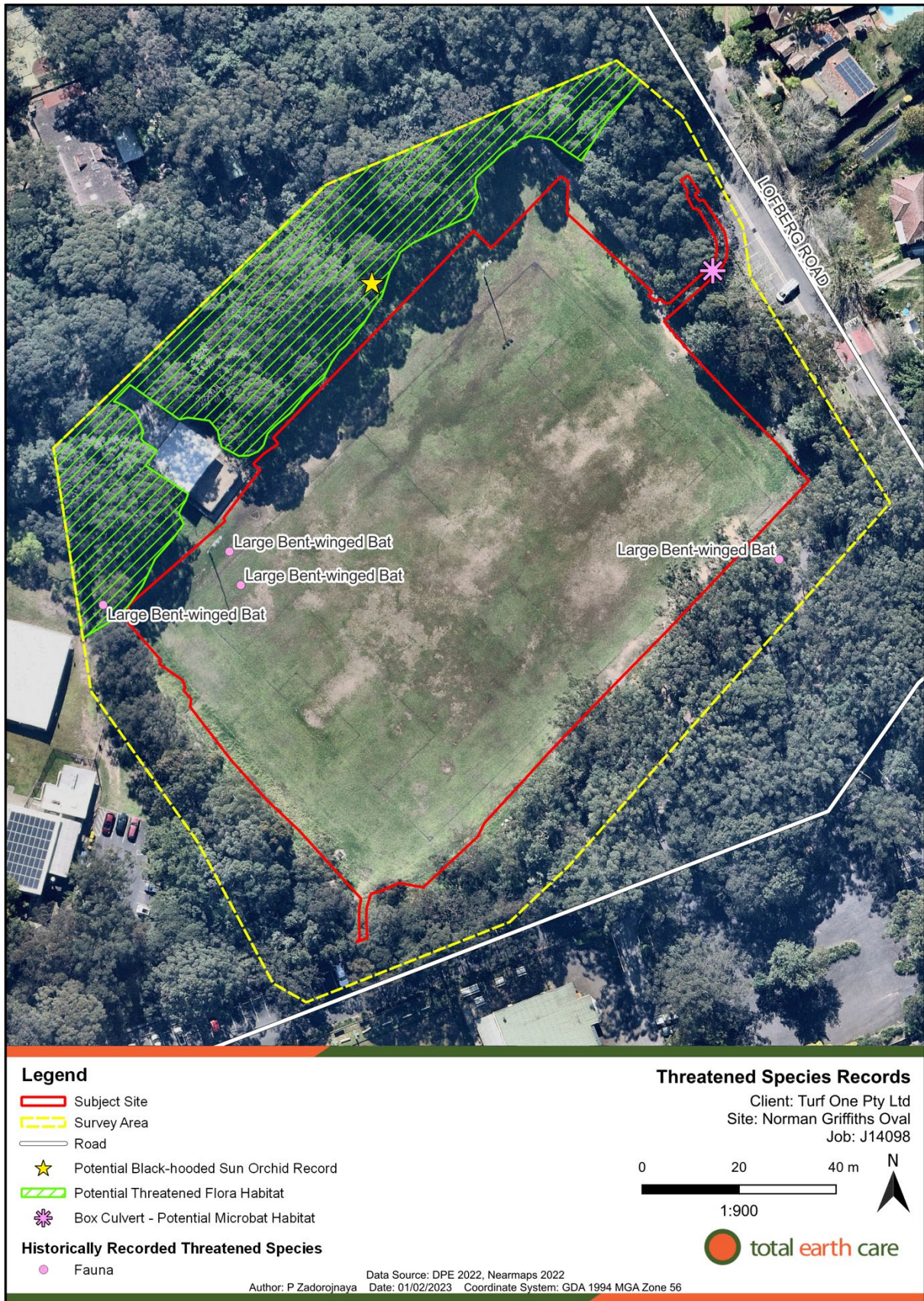


Figure 7. Threatened species records and potential habitat.



## 4 Impact Assessment

### 4.1 Direct Impacts

#### 4.1.1 Native Vegetation and Flora

The Proposal will involve extensive earthworks to facilitate the synthetic oval and stormwater mitigation works, with maximum excavation cut depths of approximately 1.7m (Turf One, 2022). This will involve the complete clearing of approximately 1.05ha of exotic dominant lawn vegetation, with the common Couch as the only native groundcover species expected to be directly impacted. The Proposal will also involve the removal of one historically cultivated *Melia azedarach* (White Cedar; Tree Survey, 2022), however this tree is not representative of the locally occurring STIF.

The BC Act listed Critically Endangered, Black-hooded Sun Orchid, which may occur within the greater Survey Area will not be directly impacted by the Proposal, nor its potential habitat, which will be protected throughout the Proposal with the implementation of mitigation measures outlined in Section 5. An Assessment of Significance (5-part Test) under the BC Act has concluded that the Proposal will not have a significant impact on this species (Appendix D).

Additional direct impacts as a result of the Proposal include the potential importation of invasive species and disease, and incidental trampling by personnel and machinery. These impacts are particularly pertinent to the CEEC occurring directly adjacent to the Subject Site, however can be successfully avoided with the implementation of mitigation measures outlined in Section 5. An Assessment of Significance (5-part Test) under the BC Act (Appendix D) and Assessment of Significant Impact Criteria under the EPBC Act (Appendix E) have concluded that the Proposal will not have a significant impact on this CEEC.

#### 4.1.2 Fauna

The Proposal will involve the direct removal of one historically cultivated *Melia azedarach* (White Cedar). This tree may provide potential sporadic foraging habitat for locally occurring fauna. However, local fauna are likely more dependent on the surrounding habitat including the mature trees bordering the Subject Site. Moreover, large areas of intact bushland to the north of the Subject Site provide foraging, roosting, and breeding resources and habitat for locally dependent fauna.

Additional direct impacts may occur as a result of the proposed stormwater works, particularly the partial demolition of the box culvert in the eastern extent of the Subject Site. As previously discussed, this box culvert may provide potential roosting habitat for the following threatened Microbat species:

- Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*) – Vulnerable under the BC Act
- Little Bent-winged Bat (*Miniopterus australis*) – Vulnerable under the BC Act
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*) – Vulnerable under the BC Act
- Southern Myotis (*Myotis macropus*) – Vulnerable under the BC Act.

The Proposal will result in a low and short-term impact to these species with the implementation of mitigation measures outlined in Section 5. An Assessment of Significance (5-part Test) under the BC Act has concluded that the Proposal will not have a significant impact on these threatened Microbats (Appendix D).

### 4.2 Indirect Impacts

#### 4.2.1 Introduction of Invasive Species and Pathogens

Increased disturbance during construction has the potential to increase the occurrence and prevalence of non-native and invasive species within the CEEC surrounding the Subject Site. However, if appropriate biosecurity measures and hygiene protocols (i.e., wash down vehicles in situ) are maintained, this risk could be reduced and is highly manageable.

The Proposal would require the importation and exportation of materials and equipment in and out of the Subject site. There is the potential that disease including pathogens that may affect native species could be brought into the Subject Site, however, this may be reduced with the implementation of best practice hygiene methods. *Phytophthora* hygiene protocols should be implemented during construction to reduce the risk of phytophthora entering the site (Appendix F).

#### **4.2.2 Erosion**

Increases in erosive action as a result of the Proposal have the potential to alter sediment loads across the Subject Site and within the Survey Area. This can result in indirect impacts to flora species either through the loss of soil or increased sediment loads to individuals and their surrounding soil profile affecting their lifecycle. This is particularly pertinent for the CEEC surrounding the Subject Site, however an Assessment of Significance (5-part Test) under the BC Act (Appendix D), and Assessment of Significant Impact Criteria under the EPBC Act (Appendix E) concluded that this potential indirect impact will not significantly impact the CEEC.

#### **4.2.3 Hydrology**

The Proposal will have a low impact on the surface hydrology across the Subject Site due to the removal of lawn vegetation, reducing root extraction of water through the soil profile. However, given that the Subject Site occurs at a lower elevation than the surrounding CEEC, and with the construction of the stormwater mitigation system as part of the Proposal, this will likely result in a minor impact to the surrounding CEEC. An Assessment of Significance (5-part Test) under the BC Act (Appendix D), and Assessment of Significant Impact Criteria under the EPBC Act (Appendix E) concluded that this potential indirect impact will not significantly impact the CEEC.

The synthetic turf field may increase pollutants such as microplastics and chemicals entering the stormwater system and impacting connecting waterways. However, stormwater design strategies have been adopted to minimise this risk (Willowtree Planning, 2022).

#### **4.2.4 Light, Noise and Vibration**

An influx of light, noise and vibration is expected during construction works. Changes to the light and noise environment are also expected during operation of the proposed artificial oval. Fauna are affected by alterations to levels of light and noise within their environment. During operation, the oval would increase light and noise pollution within the Survey Area. However, existing sources of noise and light pollution are present surrounding the Survey Area and locality including the surrounding roads, fitness and aquatic centre, scout hall and bowling club. Fauna that inhabit the area would be accustomed to the current light and noise environment with small adjustments in noise and light levels likely inconsequential for local fauna. Impacts as a result of vibration will be short-term and minor.

#### **4.2.5 Heat Island Effect**

Natural turf mitigates the urban heat island effect and provides a relatively cool surface, particularly in summer. Alternatively, synthetic turf absorbs rather than reflects sunlight, causing the emission of heat (Ethos Urban Pty Ltd, 2021). The proposed synthetic turf field will likely have a minor and localised increase in the heat island effect given the small area of synthetic turf proposed in comparison to the surrounding bushland. Furthermore, the strategic selection of granulated cork infill used for the Proposal has been measured to be approximately 20° cooler on particularly hot days in comparison to standard synthetic fields infilled with rubber (Willowtree Planning, 2022).

An increase in temperature on the synthetic surface is likely to have a minor impact on resident fauna as they are highly mobile and would favour the more-suitable surrounding habitat situated away from the urban field. The potential impacts to native flora are highly unlikely given the prevalence of exotic species directly adjacent the proposed synthetic turf field.



## 5 Mitigation Measures

The following mitigation measures are to be implemented prior to and during the construction process. Taking into consideration the results from the desktop research and ecological site assessment, site-specific mitigation measures are made in order to either reduce the impacts of the Proposal on the Subject Site's biodiversity values, or to ensure potential impacts to the retained vegetation and biodiversity on and surrounding the Subject Site is minimised. The mitigation measures are provided in Table 3 below.

**Table 3. Mitigation measures to be implemented prior to and during construction**

Safeguards	Responsibility	Timing
During clearing works or construction works, if any threatened flora or fauna are identified, works will stop immediately and a qualified Ecologist will be contacted.	All personnel on site	Pre-construction and construction
All vegetation to be retained will be appropriately protected during the entire extent of the works, e.g. temporary fencing, flagging and tree protection. This includes fencing around the No-Go Zones identified in Figure 8, excluding all existing footpaths and roads. If clearing is to occur outside the assessed area within this report, this document will be amended by a suitably qualified Ecologist to include all new scope, prior to works commencing.	Construction contractor/Project Manager	Construction
All personnel on site will be made aware of areas of high ecological value, including the presence of the CEEC and potential threatened species habitat, before entering the work site.	All personnel on site	Pre-construction
No machinery, plant, vehicles, stockpiles, rubbish, or any other material associated with the Proposal will be placed within areas of high ecological value. The areas of high ecological value are shown as No-Go Zones in Figure 8, excluding all existing footpaths and roads.	All personnel on site	Pre-construction, Construction
A pre-clearing inspection must be completed by a suitably qualified Ecologist, targeting the box culvert within the Subject Site for inhabiting Microbats. If Microbats are identified, a Microbat Translocation Plan will be prepared and any residing individuals will be safely relocated (nocturnally) prior to the commencement of works.	Construction contractor/Project Manager and Ecologist	Pre-construction
Vegetation will be inspected for potential fauna prior to clearing or trimming. A two staged approach will be used for removing non-habitat vegetation to enable fauna to move away. An Ecologist will be engaged if clearing vegetation with potential fauna habitat or assistance is required to move fauna.	Construction contractor/Project Manager	Pre-construction and construction
If any fauna are identified during works and require rescue, a qualified Ecologist, or fauna rescue volunteer, will be notified. Works will not continue until the animal has been rescued. Call either Sydney Metro Wildlife on 9413 4300 or WIRES on 1300 094 737.	All personnel on site	Pre-construction and construction
Erosion and sediment control will be detailed in a Construction and Environmental Management Plan (CEMP), including types of control, method of installation, locations, maintenance regime, responsibilities, and stockpile storage. All sedimentation and erosion control measures will be designed, installed, and maintained using procedures outlined in <i>Managing Urban Stormwater: Soils and Construction 2004 4th edition</i> (Landcom, 2004). Controls are to maintained daily and installed prior to any construction activity.	Construction contractor	Pre-construction

Safeguards	Responsibility	Timing
Strict <i>Phytophthora</i> hygiene protocols will be followed (Appendix F), including the wash down of mud on machinery, vehicles and footwear and the use of 3:1 methylated spirits and water spray.	All personnel on site	Pre-construction and construction
Manage biosecurity in accordance with: <ul style="list-style-type: none"> <li>• <i>Biosecurity Act 2015</i> (see NSW Weedwise)</li> <li>• Best practise bush regeneration techniques, including disposal of sealed bagged weeds to a licenced waste disposal facility.</li> </ul>	All personnel on site	Pre-construction and construction
Best practice hygiene will be implemented to prevent the spread of invasive weeds. Vehicles and plants will be inspected for mud and soils before entering and leaving site. Stockpiles of materials containing invasive weed plant matter will be covered and bunded to prevent spread.	All personnel on site	Pre-construction and construction
Stockpiling or refuelling will be undertaken in allocated areas such as existing asphalt and/or hard standing or cleared lawn areas. Stockpiles and refuelling areas will be clearly marked and have appropriate bunding and erosion and sediment controls in place.	Construction contractor/Project Manager	Pre-construction and construction
Heavy machinery, plant or equipment are to be stored in allocated areas. These will be on existing hardstand areas or previously cleared areas, such as the exotic lawn oval or neighbouring parking lot.	Construction contractor/Project Manager	Pre-construction and construction
Waste and excess spoil will be managed in accordance with the <i>NSW EPA Waste Classification Guidelines</i> (EPA, 2014). Waste (including weed materials) will be disposed of at an appropriately licenced facility.	Construction contractor/Project Manager	Pre-construction and construction
All waste will be stored in ancillary areas and removed from site to a suitably licenced waste facility.	Construction contractor/Project Manager	Pre-construction and construction





Figure 8. No-Go Zone.



## 6 Conclusion

The Proposal will involve minor direct impacts to vegetation and potential fauna habitat, however with the implementation of the mitigation measures outlined in this report, impacts will be minor and short-term. Although the Survey Area may be used by locally dependent fauna, the Subject Site contains little existing biodiversity value. Moreover, areas of ecological value within the Survey Area will not be directly impacted by the Proposal, particularly the potential Black-hooded Sun Orchid habitat and Critically Endangered Ecological Community.

In summary:

- No threatened species were identified within the Survey Area, however potential habitat exists for the BC Act listed Critically Endangered, *Thelymitra atronitida* (Black-hooded Sun Orchid), and culvert-dwelling Microbats:
  - Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*) – Vulnerable under the BC Act
  - Little Bent-winged Bat (*Miniopterus australis*) – Vulnerable under the BC Act
  - Large Bent-winged Bat (*Miniopterus orianae oceanensis*) – Vulnerable under the BC Act
  - Southern Myotis (*Myotis macropus*) – Vulnerable under the BC Act.
- One PCT (3262) is present within the Survey Area which conforms to the BC listed CEEC Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion and the EPBC listed CEEC Turpentine-Ironbark Forest of the Sydney Basin Bioregion, however no direct impacts are proposed.
- One (1) historically cultivated *Melia azedarach* (White Cedar) will be removed as part of the Proposal, along with approximately 1.05ha of exotic dominant lawn vegetation.
- The partial demolition of the box culvert in the eastern extent of the Subject Site may impact potential roosting habitat for the above-listed Microbats, however with the implementation of mitigation measures, impacts will likely be low and short-term.
- Indirect impacts include increased vulnerability to invasive species and pathogens, alterations to hydrology and sedimentary processes, and a minor increase in the heat island effect.

This report has fully addressed the mandatory environmental impact assessment requirements for activities subject to Division 5.1 of the EP&A Act. In conclusion, the Proposal does not pose a significant impact on threatened ecological communities, species or their habitats, therefore a Biodiversity Development Assessment Report or Species Impact Statement is not required.

Please let me know if you have any further questions.

Kind Regards,



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## Appendix A. EPBC Protected Matters Search Results

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Australian Government

Department of Climate Change, Energy,  
the Environment and Water

# EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 21-Dec-2022

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



# Summary

## Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance (Ramsar)</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	12
<a href="#">Listed Threatened Species:</a>	91
<a href="#">Listed Migratory Species:</a>	45

## Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

<a href="#">Commonwealth Lands:</a>	96
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	50
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None
<a href="#">Habitat Critical to the Survival of Marine Turtles:</a>	None

## Extra Information

This part of the report provides information that may also be relevant to the area you have

<a href="#">State and Territory Reserves:</a>	5
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">EPBC Act Referrals:</a>	27
<a href="#">Key Ecological Features (Marine):</a>	None
<a href="#">Biologically Important Areas:</a>	None
<a href="#">Bioregional Assessments:</a>	1
<a href="#">Geological and Bioregional Assessments:</a>	None

# Details

## Matters of National Environmental Significance

### Listed Threatened Ecological Communities

[ [Resource Information](#) ]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Blue Gum High Forest of the Sydney Basin Bioregion</a>	Critically Endangered	Community likely to occur within area	In buffer area only
<a href="#">Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion</a>	Endangered	Community may occur within area	In buffer area only
<a href="#">Coastal Swamp Oak (<i>Casuarina glauca</i>) Forest of New South Wales and South East Queensland ecological community</a>	Endangered	Community likely to occur within area	In feature area
<a href="#">Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland</a>	Endangered	Community may occur within area	In feature area
<a href="#">Coastal Upland Swamps in the Sydney Basin Bioregion</a>	Endangered	Community likely to occur within area	In feature area
<a href="#">Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion</a>	Critically Endangered	Community may occur within area	In buffer area only
<a href="#">Eastern Suburbs Banksia Scrub of the Sydney Region</a>	Critically Endangered	Community may occur within area	In buffer area only
<a href="#">River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria</a>	Critically Endangered	Community likely to occur within area	In feature area
<a href="#">Shale Sandstone Transition Forest of the Sydney Basin Bioregion</a>	Critically Endangered	Community may occur within area	In feature area
<a href="#">Subtropical and Temperate Coastal Saltmarsh</a>	Vulnerable	Community likely to occur within area	In buffer area only
<a href="#">Turpentine-Ironbark Forest of the Sydney Basin Bioregion</a>	Critically Endangered	Community likely to occur within area	In feature area
<a href="#">Western Sydney Dry Rainforest and Moist Woodland on Shale</a>	Critically Endangered	Community likely to occur within area	In feature area



## Listed Threatened Species

[ [Resource Information](#) ]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.  
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
<b>BIRD</b>			
<a href="#">Anthochaera phrygia</a> Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Botaurus poiciloptilus</a> Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Callocephalon fimbriatum</a> Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Calyptorhynchus lathami lathami</a> South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Charadrius leschenaultii</a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Dasyornis brachypterus</a> Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Diomedea antipodensis</a> Antipodean Albatross [64458]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Diomedea antipodensis gibsoni</a> Gibson's Albatross [82270]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Erythrotriorchis radiatus</a> Red Goshawk [942]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Falco hypoleucos</a> Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Grantiella picta</a> Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Hirundapus caudacutus</a> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Lathamus discolor</a> Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Limosa lapponica baueri</a> Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Pachyptila turtur subantarctica</a> Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Pycnoptilus floccosus</a> Pilotbird [525]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Sternula nereis nereis</a> Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche bulleri</a> Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche bulleri platei</a> Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche eremita</a> Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Thalassarche salvini</a> Salvin's Albatross [64463]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<b>FISH</b>			
<a href="#">Epinephelus daemeli</a> Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Macquaria australasica</a> Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Prototroctes maraena</a> Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thunnus maccoyii</a> Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only
<b>FROG</b>			
<a href="#">Heleioporus australiacus</a> Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Litoria aurea</a> Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Mixophyes balbus</a> Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<b>MAMMAL</b>			
<a href="#">Chalinolobus dwyeri</a> Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Dasyurus maculatus maculatus (SE mainland population)</a> Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Isoodon obesulus obesulus</a> Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area	In feature area



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Notamacropus parma</a> Parma Wallaby [89289]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Petauroides volans</a> Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Petaurus australis australis</a> Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Petrogale penicillata</a> Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)</a> Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Pseudomys novaehollandiae</a> New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Pteropus poliocephalus</a> Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
<b>PLANT</b>			
<a href="#">Acacia bynoeana</a> Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Acacia pubescens</a> Downy Wattle, Hairy Stemmed Wattle [18800]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Acacia terminalis subsp. terminalis MS</a> Sunshine Wattle (Sydney region) [88882]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Allocasuarina glareicola</a> [21932]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Asterolasia elegans</a> [56780]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Caladenia tessellata</a> Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Cryptostylis hunteriana</a> Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Cynanchum elegans</a> White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Darwinia biflora</a> [14619]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Deyeuxia appressa</a> [7438]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Epacris sparsa</a> [16450]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Eucalyptus camfieldii</a> Camfield's Stringybark [15460]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Genoplesium baueri</a> Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid [7528]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Haloragodendron lucasii</a> Hal [6480]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Hibbertia spanantha</a> Julian's Hibbertia [88475]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Lasiopetalum joyceae</a> [20311]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Leptospermum deanei</a> Deane's Tea-tree [21777]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Melaleuca biconvexa</a> Biconvex Paperbark [5583]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Melaleuca deanei</a> Deane's Melaleuca [5818]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Persicaria elatior</a> Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Persoonia hirsuta</a> Hairy Geebung, Hairy Persoonia [19006]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Persoonia mollis subsp. maxima</a> [56075]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Pimelea curviflora var. curviflora</a> [4182]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Pimelea spicata</a> Spiked Rice-flower [20834]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Pomaderris brunnea</a> Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Prostanthera densa</a> Villous Mintbush [12233]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Prostanthera junonis</a> Somersby Mintbush [64960]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Prostanthera marifolia</a> Seaforth Mintbush [7555]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Rhizanthella slateri</a> Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Rhodamnia rubescens</a> Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Rhodomyrtus psidioides</a> Native Guava [19162]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Syzygium paniculatum</a> Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Thesium australe</a> Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area

## REPTILE

<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Hoplocephalus bungaroides</a> Broad-headed Snake [1182]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

#### SHARK

<a href="#">Sphyrna lewini</a> Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only
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#### SNAIL

<a href="#">Pommerhelix duralensis</a> Dural Land Snail [85268]	Endangered	Species or species habitat likely to occur within area	In feature area
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#### Listed Migratory Species [ [Resource Information](#) ]

Scientific Name	Threatened Category	Presence Text	Buffer Status
<b>Migratory Marine Birds</b>			
<a href="#">Anous stolidus</a> Common Noddy [825]		Species or species habitat likely to occur within area	In buffer area only
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
<a href="#">Ardenna grisea</a> Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In buffer area only
<a href="#">Calonectris leucomelas</a> Streaked Shearwater [1077]		Species or species habitat known to occur within area	In buffer area only
<a href="#">Diomedea antipodensis</a> Antipodean Albatross [64458]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Fregata ariel</a> Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In buffer area only
<a href="#">Fregata minor</a> Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area	In buffer area only
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Phaethon lepturus</a> White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche bulleri</a> Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche eremita</a> Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Thalassarche salvini</a> Salvin's Albatross [64463]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<b>Migratory Marine Species</b>			
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<a href="#">Lamna nasus</a> Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area	In buffer area only
<a href="#">Mobula alfredi as Manta alfredi</a> Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In buffer area only
<a href="#">Mobula birostris as Manta birostris</a> Giant Manta Ray [90034]		Species or species habitat may occur within area	In buffer area only
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<b>Migratory Terrestrial Species</b>			
<a href="#">Cuculus optatus</a> Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Hirundapus caudacutus</a> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Monarcha melanopsis</a> Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
<a href="#">Motacilla flava</a> Yellow Wagtail [644]		Species or species habitat likely to occur within area	In feature area
<a href="#">Myiagra cyanoleuca</a> Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
<a href="#">Rhipidura rufifrons</a> Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
<a href="#">Symposiachrus trivirgatus as Monarcha trivirgatus</a> Spectacled Monarch [83946]		Species or species habitat known to occur within area	In feature area
<b>Migratory Wetlands Species</b>			
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Charadrius leschenaultii</a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Gallinago hardwickii</a> Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area	In feature area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area	In feature area

## Other Matters Protected by the EPBC Act

### Commonwealth Lands [\[ Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
<b>Commonwealth Bank of Australia</b>		
Commonwealth Land - Commonwealth Bank of Australia [13909]	NSW	In buffer area only
<b>Commonwealth Trading Bank of Australia</b>		
Commonwealth Land - Commonwealth Trading Bank of Australia [13043]	NSW	In buffer area only
<b>Communications, Information Technology and the Arts - Australian Postal Corporation</b>		
Commonwealth Land - Australian Postal Commission [13099]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [13047]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [13924]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [13925]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Australian Postal Commission [13923]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [13055]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [13910]	NSW	In buffer area only
Commonwealth Land - Australian Postal Corporation [16164]	NSW	In buffer area only
Commonwealth Land - Australian Postal Corporation [16174]	NSW	In buffer area only
<b>Communications, Information Technology and the Arts - Telstra Corporation Limited</b>		
Commonwealth Land - Australian Telecommunications Commission [13057]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [13926]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [13033]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [13100]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [13911]	NSW	In buffer area only
<b>Defence</b>		
Commonwealth Land - Defence Service Homes Corporation [13042]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [13068]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [13041]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [13066]	NSW	In feature area
Commonwealth Land - Defence Service Homes Corporation [13065]	NSW	In feature area
Commonwealth Land - Defence Service Homes Corporation [13067]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [13064]	NSW	In buffer area only
Defence - PYMBLE MULTI-USER DEPOT [11123]	NSW	In buffer area only
<b>Defence - Defence Housing Authority</b>		
Commonwealth Land - Defence Housing Authority [13035]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [13036]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [13037]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15975]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15964]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15977]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Housing Authority [15974]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [13046]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [13045]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [13038]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15683]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [13044]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [13927]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [13049]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15743]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15895]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15896]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [13052]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [13051]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [13050]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16163]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15417]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [13089]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16061]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15671]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15672]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [13084]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [13918]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15972]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15892]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15893]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15973]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15976]	NSW	In buffer area only



Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Director of War Service Homes [13062]	NSW	In feature area
Commonwealth Land - Director of War Service Homes [13063]	NSW	In feature area
Commonwealth Land - Director of War Service Homes [13061]	NSW	In feature area
Commonwealth Land - Director of War Service Homes [13060]	NSW	In feature area
Commonwealth Land - Director of War Service Homes [13048]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [13056]	NSW	In feature area
Commonwealth Land - Director of War Service Homes [13059]	NSW	In feature area
Commonwealth Land - Director of War Service Homes [13058]	NSW	In feature area
Commonwealth Land - Director of War Service Homes [13075]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [13074]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [13077]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [13079]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [13076]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [13073]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [13072]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [13082]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [13083]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [13080]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [13081]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [13071]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [13087]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [13088]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [13086]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [13085]	NSW	In buffer area only
<b>Education, Science and Training - CSIRO</b>		
Commonwealth Land - Commonwealth Scientific & Industrial Research Organisation [16156]	NSW	In buffer area only
Commonwealth Land - Commonwealth Scientific & Industrial Research Organisation [16154]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Commonwealth Scientific & Industrial Research Organisation [16155]	NSW	In buffer area only
Commonwealth Land - Commonwealth Scientific & Industrial Research Organisation [13069]	NSW	In buffer area only
Commonwealth Land - Commonwealth Scientific & Industrial Research Organisation [16152]	NSW	In buffer area only
Commonwealth Land - Commonwealth Scientific & Industrial Research Organisation [16153]	NSW	In buffer area only
Commonwealth Land - Commonwealth Scientific & Industrial Research Organisation [15954]	NSW	In buffer area only
Commonwealth Land - Commonwealth Scientific & Industrial Research Organisation [16536]	NSW	In buffer area only
Commonwealth Land - Commonwealth Scientific & Industrial Research Organisation [16535]	NSW	In buffer area only
Commonwealth Land - Commonwealth Scientific & Industrial Research Organisation [13070]	NSW	In buffer area only

#### Unknown

Commonwealth Land - [13034]	NSW	In buffer area only
Commonwealth Land - [15674]	NSW	In buffer area only
Commonwealth Land - [13078]	NSW	In buffer area only
Commonwealth Land - [15673]	NSW	In buffer area only
Commonwealth Land - [13101]	NSW	In buffer area only

#### Listed Marine Species

[ [Resource Information](#) ]

Scientific Name	Threatened Category	Presence Text	Buffer Status
<b>Bird</b>			
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
<a href="#">Anous stolidus</a> Common Noddy [825]		Species or species habitat likely to occur within area	In buffer area only
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Ardena grisea as Puffinus griseus</a> Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In buffer area only
<a href="#">Bubulcus ibis as Ardea ibis</a> Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#">Calonectris leucomelas</a> Streaked Shearwater [1077]		Species or species habitat known to occur within area	In buffer area only
<a href="#">Charadrius leschenaultii</a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Diomedea antipodensis</a> Antipodean Albatross [64458]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Diomedea antipodensis gibsoni as Diomedea gibsoni</a> Gibson's Albatross [82270]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Fregata ariel</a> Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In buffer area only
<a href="#">Fregata minor</a> Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area	In buffer area only
<a href="#">Gallinago hardwickii</a> Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
<a href="#">Hirundapus caudacutus</a> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#">Lathamus discolor</a> Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Monarcha melanopsis</a> Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#">Motacilla flava</a> Yellow Wagtail [644]		Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#">Myiagra cyanoleuca</a> Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#">Neophema chrysostoma</a> Blue-winged Parrot [726]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Pachyptila turtur</a> Fairy Prion [1066]		Species or species habitat likely to occur within area	In buffer area only
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
<a href="#">Phaethon lepturus</a> White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Rhipidura rufifrons</a> Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#">Rostratula australis as Rostratula benghalensis (sensu lato)</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#">Symposiachrus trivirgatus as Monarcha trivirgatus</a> Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#">Thalassarche bulleri</a> Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche bulleri platei as Thalassarche sp. nov.</a> Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche eremita</a> Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Thalassarche salvini</a> Salvin's Albatross [64463]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area	In feature area

## Reptile

<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

## Extra Information

State and Territory Reserves			[ Resource Information ]
Protected Area Name	Reserve Type	State	Buffer Status
102 Rosedale Road	NRS Addition - Gazettal in Progress	NSW	In buffer area only
Dalrymple-Hay	Nature Reserve	NSW	In buffer area only
Garigal	National Park	NSW	In buffer area only
Lane Cove	National Park	NSW	In feature area
Wallumatta	Nature Reserve	NSW	In buffer area only

EPBC Act Referrals				[ Resource Information ]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
<a href="#">Controlled action</a> <a href="#">Concept Plan Proposal for residential and commercial</a>	2008/4083	Controlled Action	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
<b>Controlled action</b>				
<a href="#">development of UTS Kuring-North West Rail Link</a>	2012/6360	Controlled Action	Post-Approval	In buffer area only
<a href="#">Proposed Residential Development and Demolition of Existing Dwelling</a>	2008/4155	Controlled Action	Completed	In buffer area only
<a href="#">Redevelopment, Upgrade and Expansion of Wahroonga Estate</a>	2008/4460	Controlled Action	Post-Approval	In buffer area only
<a href="#">Relocation of Grey-Headed Flying-Fox Colony</a>	2008/4646	Controlled Action	Post-Approval	In buffer area only
<a href="#">Residential development of Lot 12, DP 17431</a>	2007/3455	Controlled Action	Completed	In buffer area only
<b>Not controlled action</b>				
<a href="#">Change of use of existing room in research laboratory</a>	2002/665	Not Controlled Action	Completed	In buffer area only
<a href="#">Construction and Operation of the Parramatta Rail Link - between Parramatta and</a>	2002/673	Not Controlled Action	Completed	In buffer area only
<a href="#">construction of four dwellings and associated facilities</a>	2005/2396	Not Controlled Action	Completed	In feature area
<a href="#">Fuel Reduction Proposal Redfield Road, East Killara</a>	2003/1238	Not Controlled Action	Completed	In feature area
<a href="#">Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia</a>	2015/7522	Not Controlled Action	Completed	In feature area
<a href="#">INDIGO Central Submarine Telecommunications Cable</a>	2017/8127	Not Controlled Action	Completed	In buffer area only
<a href="#">Ivanhoe Estate Redevelopment, Macquarie Park, NSW</a>	2019/8455	Not Controlled Action	Completed	In buffer area only
<a href="#">M2 Motorway Upgrade</a>	2010/5329	Not Controlled Action	Completed	In buffer area only
<a href="#">Proposed third rail track and associated infrastructure</a>	2013/6760	Not Controlled Action	Completed	In buffer area only
<a href="#">Pymble Ladies College Proposed Senior's Learning Centre and Carparking Area</a>	2009/5168	Not Controlled Action	Completed	In buffer area only
<a href="#">Redevelopment of Lot 1 DP 375262 and Lot 1 DP 726091 (formerly John Williams Res</a>	2006/3161	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
<b>Not controlled action</b>				
<a href="#">Remediation of contaminated asbestos site</a>	2002/608	Not Controlled Action	Completed	In buffer area only
<a href="#">Removal of up to 7 trees at 17 Kissing Point Road, Turrumurra, NSW</a>	2014/7369	Not Controlled Action	Completed	In buffer area only
<a href="#">Residential subdivision, cnr Doris Hirst Place and Highs Road</a>	2005/2392	Not Controlled Action	Completed	In buffer area only
<a href="#">Residential subdivision and stormwater management facilities</a>	2003/1141	Not Controlled Action	Completed	In feature area
<a href="#">Residential subdivision works, Spurway St, Ermington</a>	2003/1130	Not Controlled Action	Completed	In buffer area only
<a href="#">subdivision and development on the Rhodes Peninsula for residential and commerci</a>	2003/1249	Not Controlled Action	Completed	In feature area
<a href="#">Subdivision and sale of Commonwealth land in Pymble to Kuring-gai City Council</a>	2004/1368	Not Controlled Action	Completed	In feature area
<a href="#">Sub-division of 44 Blytheswood Avenue</a>	2002/566	Not Controlled Action	Completed	In buffer area only
<b>Referral decision</b>				
<a href="#">Ivanhoe Estate Redevelopment, Macquarie Park, NSW</a>	2018/8184	Referral Decision	Completed	In buffer area only
<a href="#">Relocation of Grey-Headed Flying-Fox Colony</a>	2008/4568	Referral Decision	Completed	In buffer area only
<b>Bioregional Assessments</b>				
SubRegion	BioRegion	Website	Buffer Status	
Sydney	Sydney Basin	<a href="#">BA website</a>	In feature area	



# Caveat

## 1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

## 2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

## 3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

## 4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

# Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

## Appendix B. Flora species identified within the Survey Area

Family	Exotic	Scientific Name	Common Name	BC Status	EPBC Status
Apiaceae		<i>Centella asiatica</i>	Indian Pennywort		
Araliaceae		<i>Polyscias sambucifolia</i>	Elderberry Panax		
Asteraceae	*	<i>Bidens pilosa</i>	Cobbler's Pegs		
Asteraceae	*	<i>Gamochaeta coarctata</i>			
Asteraceae	*	<i>Sonchus oleraceus</i>	Common Sowthistle		
Asteraceae	*	<i>Taraxacum officinale</i>	Dandelion		
Bignoniaceae		<i>Pandorea pandorana</i>	Wonga Wonga Vine		
Campanulaceae		<i>Lobelia purpurascens</i>	Whiteroot		
Casuarinaceae		<i>Allocasuarina littoralis</i>	Black She-Oak		
Convolvulaceae		<i>Dichondra repens</i>	Kidney Weed		
Cyperaceae	*	<i>Cyperus eragrostis</i>	Umbrella Sedge		
Cyperaceae		<i>Lepidosperma laterale</i>	Variable Sword-sedge		
Dennstaedtiaceae		<i>Pteridium esculentum</i>	Bracken		
Ericaceae		<i>Leucopogon juniperinus</i>	Prickly Beard-heath		
Fabaceae (Faboideae)		<i>Glycine clandestina</i>	Twining glycine		
Fabaceae (Faboideae)	*	<i>Trifolium repens</i>	White Clover		
Fabaceae (Mimosoideae)		<i>Acacia linifolia</i>	White Wattle		
Fabaceae (Mimosoideae)		<i>Acacia parramattensis</i>	Parramatta Wattle		
Haloragaceae		<i>Gonocarpus tetragynus</i>	Poverty Raspwort		
Lomandraceae		<i>Lomandra longifolia</i>	Spiny-headed Mat-rush		
Luzuriagaceae		<i>Eustrephus latifolius</i>	Wombat Berry		
Malvaceae	*	<i>Modiola caroliniana</i>	Red-flowered Mallow		
Malvaceae	*	<i>Sida rhombifolia</i>	Paddy's Lucerne		
Meliaceae		<i>Melia azedarach</i>	White Cedar		
Myrtaceae		<i>Acmena smithii</i>	Lilly Pilly		
Myrtaceae		<i>Angophora costata</i>	Sydney Red Gum		
Myrtaceae		<i>Angophora floribunda</i>	Rough-barked Apple		
Myrtaceae		<i>Eucalyptus paniculata</i>	Grey Ironbark		
Myrtaceae		<i>Eucalyptus pilularis</i>	Blackbutt		
Myrtaceae		<i>Kunzea ambigua</i>	Tick Bush	P	
Myrtaceae		<i>Lophostemon confertus</i>	Brush Box		
Myrtaceae		<i>Syncarpia glomulifera</i>	Turpentine		
Oleaceae		<i>Notelaea longifolia</i>	Large Mock-olive		
Oleaceae	*	<i>Olea europaea</i>	Common Olive		
Orchidaceae		<i>Cryptostylis erecta</i>	Tartan Tongue Orchid	P	
Oxalidaceae		<i>Oxalis perennans</i>			
Phormiaceae		<i>Dianella caerulea</i>	Blue Flax-lily		
Phormiaceae		<i>Stypandra glauca</i>	Nodding Blue Lily		
Phyllanthaceae		<i>Breynia oblongifolia</i>	Coffee Bush		
Phyllanthaceae		<i>Poranthera microphylla</i>	Small Poranthera		
Pittosporaceae		<i>Billardiera scandens</i>	Hairy Apple Berry		
Pittosporaceae		<i>Bursaria spinosa</i>	Native Blackthorn		
Pittosporaceae		<i>Pittosporum undulatum</i>	Sweet Pittosporum		

Family	Exotic	Scientific Name	Common Name	BC Status	EPBC Status
Plantaginaceae	*	<i>Plantago lanceolata</i>	Lamb's Tongues		
Plantaginaceae		<i>Veronica plebeia</i>	Trailing Speedwell		
Poaceae		<i>Austrostipa rudis</i>			
Poaceae	*	<i>Briza maxima</i>	Quaking Grass		
Poaceae	*	<i>Bromus catharticus</i>	Praire Grass		
Poaceae	*	<i>Cenchrus clandestinus</i>	Kikuyu Grass		
Poaceae		<i>Cynodon dactylon</i>	Common Couch		
Poaceae	*	<i>Digitaria sanguinalis</i>	Crab Grass		
Poaceae		<i>Echinopogon caespitosus</i>	Bushy Hedgehog-grass		
Poaceae	*	<i>Ehrharta erecta</i>	Panic Veldtgrass		
Poaceae		<i>Entolasia marginata</i>	Bordered Panic		
Poaceae		<i>Entolasia stricta</i>	Wiry Panic		
Poaceae		<i>Imperata cylindrica</i>	Blady Grass		
Poaceae		<i>Microlaena stipoides</i>	Weeping Grass		
Poaceae		<i>Oplismenus imbecillis</i>			
Poaceae	*	<i>Paspalum dilatatum</i>	Paspalum		
Poaceae		<i>Poa affinis</i>			
Poaceae	*	<i>Stenotaphrum secundatum</i>	Buffalo Grass		
Poaceae		<i>Themeda triandra</i>			
Polygonaceae	*	<i>Rumex crispus</i>	Curled Dock		
Primulaceae	*	<i>Lysimachia arvensis</i>	Scarlet Pimpernel		
Proteaceae		<i>Grevillea linearifolia</i>	Linear-leaf Grevillea		
Proteaceae		<i>Hakea sericea</i>	Needlebush		
Proteaceae		<i>Lomatia silaifolia</i>	Crinkle Bush	P	
Rubiaceae		<i>Pomax umbellata</i>	Pomax		
Sapindaceae		<i>Dodonaea triquetra</i>	Large-leaf Hop-bush		
Solanaceae		<i>Solanum aviculare</i>	Kangaroo Apple		

BC Act Status: P – Protected



## Appendix C. Fauna species identified within the Survey Area

Family	Exotic	Scientific Name	Common Name	BC Status	EPBC Status	Obs Type
<b>Alcedinidae</b>		<i>Dacelo novaeguineae</i>	Laughing Kookaburra	P		OW
<b>Artamidae</b>		<i>Gymnorhina tibicen</i>	Australian Magpie	P		W
<b>Corvidae</b>		<i>Corvus coronoides</i>	Australian Raven	P		W
<b>Hirundinidae</b>		<i>Hirundo neoxena</i>	Welcome Swallow	P		OW
<b>Leporidae</b>	*	<i>Oryctolagus cuniculus</i>	Rabbit			O
<b>Meliphagidae</b>		<i>Manorina melanocephala</i>	Noisy Miner	P		OW
<b>Monarchidae</b>		<i>Grallina cyanoleuca</i>	Magpie-lark	P		OW
<b>Psittacidae</b>		<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	P		OW

BC Act Status: P – Protected

Obs Type: O – Observed, W – Heard

## Appendix D. Assessments of Significance (5-part Tests) under the BC Act for Threatened Species and Ecological Communities

Under Part 7, Division 1 of the BC Act, the test of significance is to be taken into account for the purposes of determining whether a proposed activity or activity is likely to significantly affect threatened species, populations or communities, or their habitats. This test should be applied to species, populations and communities listed under the BC Act that have a high likelihood or known occurrence on site and where potential or known habitat has not been avoided and/ or indirect impacts are likely regardless of the minimisation or mitigation measures proposed. The Tests of Significance have been completed as according to the *Threatened Species Test of Significance Guidelines* (OEH, 2018).

One BC Act listed CEEC was identified within the Survey Area, Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion. Although no direct impacts are proposed as a result of the Proposal, there is potential for incidental trampling and indirect impacts such as changes to hydrology. An Assessment of Significance (5-part Test) for this CEEC is provided below.

One threatened flora species may have been historically identified within the Survey Area, *Thelymitra atronitida* (Black-hooded Sun Orchid), and contains potential habitat within the Survey Area. Although no direct impacts to these areas are proposed, there is potential for similar indirect impacts.

The following culver-dwelling Vulnerable Microbats may be impacted by the proposed partial demolition of a box culvert. These species have been grouped together due to their shared potential roosting habitat:

- Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*)
- Little Bent-winged Bat (*Miniopterus australis*)
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*)
- Southern Myotis (*Myotis macropus*).

Assessments of Significance (5-part Tests) for these species are provided below.

### Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion

#### Name of threatened species or ecological community

#### Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion

Plant Community Type 3262 identified within the Survey Area conforms to the BC Act listed CEEC, Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion (STIF). This community may experience indirect impacts as a result of the Proposal. As a result, a (5-Part) Test under Section 7.3 of the BC Act is required for STIF. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect STIF.

#### Ecology

Occurs in Sydney and is heavily fragmented, with only 0.5 percent its original extent remaining intact. Remnants mostly occur in the Baulkham Hills, Hornsby, Ku-ring-gai, Parramatta, Ryde, Sutherland and Hurstville local government areas. Good examples can be seen in small reserves such as Wallumatta Nature Reserve and Newington Nature Reserve.

Open forest, with dominant canopy trees including Turpentine *Syncarpia glomulifera*, Grey Gum *Eucalyptus punctata*, Grey Ironbark *E. paniculate* and Thin-leaved Stringybark *E. eugenoides*. In areas of high rainfall (over 1050 mm per annum) Sydney Blue Gum *E. saligna* is more dominant. The shrub stratum is usually sparse and may contain mesic species such as Sweet Pittosporum *Pittosporum undulatum* and Elderberry *Panax Polyscias sambucifolia*.

Occurs close to the shale/sandstone boundary on the more fertile shale influenced soils, in higher rainfall areas on the higher altitude margins of the Cumberland Plain, and on the shale ridge caps of sandstone plateaus (NSW Threatened Species Scientific Committee, 2019).

**(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**

N/A

**Name of threatened species or ecological community****Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion****(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:****(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

The Proposal does not involve the direct removal or clearing of STIF. During construction, sediment, erosion, and the potential importation of weeds and pathogens may have minor indirect impacts on this community, however these impacts are considered low and short-term. Following construction, the artificial turf oval may lead to changes in hydrology with the reduction in groundcover absorption. However, given the STIF's relatively raised location in comparison to the oval, hydrological changes are expected to be minor and mitigated with the proposed stormwater mitigation works. As such, the Proposal will not have an adverse effect on the extent of STIF such that its local occurrence is likely to be placed at risk of extinction.

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

No native vegetation representative of STIF is proposed for removal. The potential indirect impacts of the Proposal on this CEEC will be controlled with the mitigation measures outlined in this report, resulting in minor and short-term impacts. As such, the Proposal will not substantially and adversely modify the composition of STIF such that its local occurrence is likely to be placed at a risk of extinction.

**(c) in relation to the habitat of a threatened species or ecological community****(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity**

The Proposal will not remove any habitat for STIF as it's limited to the removal of exotic dominant lawn vegetation. Although there is the potential for hydrological changes modifying the STIF habitat surrounding the Subject Site, the likelihood of impact is very low given its elevation above the oval to be impacted and the stormwater mitigation works proposed.

**(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity**

The Proposal will not result in the fragmentation or isolation of STIF from other habitats as no direct impacts are proposed. The Proposal is limited to the clearing of exotic dominant lawn.

**(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality**

The Proposal may result in incidental trampling of STIF, and indirect impacts including changes in sedimentation and hydrology. However, these impacts are not expected to significantly impact the neighbouring STIF, and would only have minor impacts. Therefore, the Proposal will not remove, modify, fragment or isolate STIF or its habitat and will not impact the long-term survival of this CEEC in the locality.

**(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)**

The Survey Area is not located in any declared area of outstanding biodiversity value.

**(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process**

The BC Act defines a 'key threatening process' (KTP) as a process that 'adversely affects threatened species or ecological communities' or 'could cause species or ecological communities that are not threatened to become threatened' (s 4.32). Schedule 4 of the BC Act provides a list of KTPs. Of those listed, the following KTP relevant to STIF will occur as part of the Proposal:

- Clearing of native vegetation
- Infection of native plants by *Phytophthora cinnamomi*

<b>Name of threatened species or ecological community</b>	<b>Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion</b>
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- Invasion and establishment of exotic vines and scramblers.

The Proposal will involve the clearing of one (1) historically cultivated native tree which does not conform to STIF, therefore the Proposal is unlikely to contribute significantly to this KTP. Following the implementation of the mitigation measures outlined in this report, *Phytophthora* and weed infestations will be controlled.

### Conclusion

The Proposal is not likely to have a “significant effect” on Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion. The Proposal:

- Will not remove, modify, or further fragment or isolate a significant area of habitat for the community.
- Does not contribute significantly to any KTP.

Consequently, a Species Impact Statement (SIS) or a Biodiversity Development Assessment Report (BDAR) is not required.

## ***Thelymitra atronitida* (Black-hooded Sun Orchid)**

<b>Name of threatened species or ecological community</b>	<b><i>Thelymitra atronitida</i> (Black-hooded Sun Orchid)</b>
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*Thelymitra atronitida* (Black-hooded Sun Orchid) is listed as Critically Endangered under the BC Act. Although targeted surveys did not identify this species within the Survey Area, a potential historical record exists, and potential habitat was identified within the Survey Area. This species may experience indirect impacts as a result of the Proposal. As a result, a (5-Part) Test under Section 7.3 of the BC Act is required for the Black-hooded Sun Orchid. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect the Black-hooded Sun Orchid.

### Ecology

In New South Wales, The Black-hooded Sun Orchid is known from two localities, Cape Solander in Botany Bay National Park in southern Sydney, and Bago State Forest south of Tumut. The known occurrences in this state fall in parts of the Sutherland and either or both of the Tumut and Tumbarumba Local Government Areas. The species also occurs in eastern Victoria.

At Cape Solander this species is recorded from shallow black peaty soil in coastal heath on sandstone. It is possible that the two coastal populations of Cape Solander and north-eastern Victoria may be distinct from the ecologically different Bago population. In the Bago area it is recorded as occurring in open forest with a heathy understorey on well-drained sand or clay-loam soils (DPE, 2022d).

### **(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**

Although no individuals were identified within the Survey Area, this species may be present in the soil seedbank within the STIF vegetation adjacent to the Subject Site. No direct impacts are proposed to this potential habitat. During construction, sediment, erosion, and the potential importation of weeds and pathogens may have minor indirect impacts on this potential habitat, however these impacts are considered low and short-term. Following construction, the artificial turf oval may lead to changes in hydrology with the reduction in groundcover absorption. However, given the habitat's relatively raised location in comparison to the oval, hydrological changes are expected to be minor and mitigated with the proposed stormwater mitigation works. Therefore, the Proposal is unlikely to adversely affect the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

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



<b>Name of threatened species or ecological community</b>	<b><i>Thelymitra atronitida</i> (Black-hooded Sun Orchid)</b>
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**(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

N/A

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

**(c) in relation to the habitat of a threatened species or ecological community**

**(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity**

No direct clearing of potential Black-hooded Sun Orchid habitat will occur as a result of the Proposal as it's limited to the clearing of exotic dominant lawn. Indirect impacts including sedimentation, erosion, importation of weeds and pathogens, and changes in hydrology may have minor impacts to this potential habitat, but with the implementation of the mitigation measures outlined within this report, this habitat is not anticipated to be modified as a result of the Proposal.

**(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity**

The Proposal will not result in the fragmentation or isolation of potential habitat for this species from other habitats as no direct impacts are proposed. The Proposal is limited to the clearing of exotic dominant lawn.

**(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality**

The Proposal will not involve the removal, fragmentation or isolation of potential habitat for this species. Potential impacts are limited to incidental trampling, sedimentation, erosion, importation of weeds and pathogens, and changes in hydrology, all of which can be appropriately controlled for ensuring no modification of potential habitat for this species.

**(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)**

The Survey Area is not located in any declared area of outstanding biodiversity value.

**(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process**

The BC Act defines a 'key threatening process' (KTP) as a process that 'adversely affects threatened species or ecological communities' or 'could cause species or ecological communities that are not threatened to become threatened' (s 4.32). Schedule 4 of the BC Act provides a list of KTPs. Of those listed, the following KTP relevant to the Black-hooded Sun Orchid will occur as part of the Proposal:

- Clearing of native vegetation
- Infection of native plants by *Phytophthora cinnamomi*
- Invasion and establishment of exotic vines and scramblers.

The Proposal will involve the clearing of only one (1) historically cultivated native tree which does not conform to the locally occurring native ecological community, therefore the Proposal is unlikely to contribute significantly to this KTP. Following the implementation of the mitigation measures outlined in this report, *Phytophthora* and weed infestations will be controlled.

## Conclusion

The Proposal is not likely to have a "significant effect" on *Thelymitra atronitida* (Black-hooded Sun Orchid). The Proposal:

- Will not remove, modify, or further fragment or isolate a significant area of habitat for the community.
- Does not contribute significantly to any KTP.

<b>Name of threatened species or ecological community</b>	<b><i>Thelymitra atronitida</i> (Black-hooded Sun Orchid)</b>
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Consequently, a Species Impact Statement (SIS) or a Biodiversity Development Assessment Report (BDAR) is not required.

## Microchiroptera (Microbats)

<b>Name of threatened species or ecological community</b>	<b>Eastern Coastal Free-tailed Bat (<i>Micronomus norfolkensis</i>)</b> <b>Little Bent-winged Bat (<i>Miniopterus australis</i>)</b> <b>Large Bent-winged Bat (<i>Miniopterus orianae oceanensis</i>)</b> <b>Southern Myotis (<i>Myotis macropus</i>).</b>
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The Eastern Coastal Free-tailed Bat, Little Bent-winged Bat, Large Bent-winged Bat and Southern Myotis are all listed as Vulnerable under the BC Act. These species were not surveyed for during the ecological site assessments in December 2022, however these species were considered highly likely to occur as associated habitat was identified and numerous recent historical records exist within a 5km radius of the Subject Site. The Large Bent-winged Bat also has numerous historical records within the Survey Area. As a result, a (5-Part) Test under Section 7.3 of the BC Act is required for these species. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect these Microbats.

### Ecology

#### Eastern Coastal Free-tailed Bat

The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW. They occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures. Usually solitary but also recorded roosting communally, probably insectivorous (DPE, 2022e).

#### Little Bent-winged Bat

Little Bent-winged Bats occur in moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. They are generally found in well-timbered areas. Little Bent-winged Bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats. They often share roosting sites with the Common Bent-winged Bat and, in winter, the two species may form mixed clusters. In NSW the largest maternity colony is in close association with a large maternity colony of Eastern Bent-winged Bats (*Miniopterus schreibersii*) and appears to depend on the large colony to provide the high temperatures needed to rear its young. Maternity colonies form in spring and birthing occurs in early summer. Males and juveniles disperse in summer. Only five nursery sites /maternity colonies are known in Australia (DPIE, 2020a).

#### Large Bent-winged Bat

Caves are the primary roosting habitat for Large Bent-winged Bats, but the species can also use derelict mines, storm-water tunnels, buildings and other man-made structures. The species form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. Maternity caves have very specific temperature and humidity regimes.

At other times of the year, populations disperse within about 300 km range of maternity caves. Cold caves are used for hibernation in southern Australia. Breeding or roosting colonies can number from 100 to 150,000 individuals. Large Bent-winged Bats hunt in forested areas, catching moths and other flying insects above the treetops (DPIE, 2019).

#### Southern Myotis

The Southern Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers. Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools

**Name of threatened species or ecological community**

**Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*)**

**Little Bent-winged Bat (*Miniopterus australis*)**

**Large Bent-winged Bat (*Miniopterus orianae oceanensis*)**

**Southern Myotis (*Myotis macropus*).**

catching insects and small fish by raking their feet across the water surface. In NSW, females have one young each year usually in November or December (DPIE, 2020b).

**(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 Proposal will involve the partial demolition of a box culvert which may provide potential roosting habitat for these species, but is unlikely to provide suitable breeding habitat. The box culvert will remain post-construction and will only be temporarily impacted during construction works. No potential foraging habitat will be impacted by the Proposal. Given the high mobility of these species and the temporary nature of the impacts, the Proposal is unlikely to have an adverse effect on the life cycle of these species such that a viable local population will be placed at risk of extinction.

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

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

N/A

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

N/A

**(c) in relation to the habitat of a threatened species or ecological community**

**(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity**

The Proposal will involve the partial demolition of a box culvert which may provide potential roosting habitat for these species, however will remain following construction works.

**(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity**

The Proposal will not result in the fragmentation or isolation of potential habitat for this species from other habitats as the box culvert will only be temporarily impacted during construction.

**(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality**

The proposed impact to the box culvert which may provide potential roosting habitat for these species is not considered important to their long-term survival given their mobility and temporary nature of impacts. No potential breeding or foraging habitat will be impacted.

**(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)**

The Survey Area is not located in any declared area of outstanding biodiversity value.

**(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process**

The BC Act defines a 'key threatening process' (KTP) as a process that 'adversely affects threatened species or ecological communities' or 'could cause species or ecological communities that are not threatened to become threatened' (s 4.32). Schedule 4 of the BC Act provides a list of KTPs. Of those listed, the following KTP relevant to the Microbats will occur as part of the Proposal:

Name of threatened species or ecological community

Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*)  
 Little Bent-winged Bat (*Miniopterus australis*)  
 Large Bent-winged Bat (*Miniopterus orianae oceanensis*)  
 Southern Myotis (*Myotis macropus*).

- Clearing of native vegetation

The Proposal will involve the clearing of only one (1) historically cultivated native tree, therefore the Proposal is unlikely to contribute significantly to this KTP.

### Conclusion

The Proposal is not likely to have a “significant effect” on these Microbats. The Proposal:

- Will not remove, modify, or further fragment or isolate a significant area of habitat for the community.
- Does not contribute significantly to any KTP.

Consequently, a Species Impact Statement (SIS) or a Biodiversity Development Assessment Report (BDAR) is not required.



## Appendix E. EPBC Act Significant Impact Criteria for Threatened Ecological Communities

Under Part 3 of the EPBC Act, assessment is required for actions that may impact on Matters of National Environmental Significance (MNES) or for actions proposed to be carried out on Commonwealth land. This self-assessment is applied to MNES listed under the EPBC Act that have a high likelihood or known occurrence on site.

This self-assessment has been completed in accordance with the *Matters of National Environmental Significance Significant Impact Guidelines 1.1* (Department of the Environment, 2013).

One EPBC Act listed CEEC was identified within the Survey Area, Turpentine-Ironbark Forest of the Sydney Basin Bioregion. Although no direct impacts are proposed as a result of the Proposal, there is potential for incidental trampling and indirect impacts such as changes to hydrology. An Assessment of Significant Impact Criteria is provided below.

### Turpentine-Ironbark Forest of the Sydney Basin Bioregion

#### Critically Endangered Ecological Community

#### Turpentine-Ironbark Forest of the Sydney Basin Bioregion

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

#### Reduce the extent of an ecological community

The Proposal does not involve the direct removal or clearing of STIF. Potential indirect impacts including sedimentation, erosion, potential importation of weeds and pathogens, and changes to hydrology are expected to be minor and short-term and will not result in the reduction of the extent of the STIF. As such, the Proposal will not reduce the extent of an ecological community

#### Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines

The Proposal will not result in the fragmentation of STIF as no direct impacts are proposed. The Proposal is limited to the clearing of exotic dominant lawn.

#### Adversely affect habitat critical to the survival of an ecological community

During construction, sediment, erosion, and the potential importation of weeds and pathogens may have minor indirect impacts on this community, however these impacts are considered low and short-term. Following construction, the artificial turf oval may lead to changes in hydrology with the reduction in groundcover absorption. However, given the STIF's relatively raised location in comparison to the oval, hydrological changes are expected to be minor and mitigated with the proposed stormwater mitigation works. As such, the Proposal will not adversely affect habitat critical to the survival of this community.

#### Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns

Following construction, the artificial turf oval may lead to changes in hydrology with the reduction in groundcover absorption. However, given the STIF's relatively raised location in comparison to the oval, hydrological changes are expected to be minor and mitigated with the proposed stormwater mitigation works. Therefore, any potential modification to hydrology as a result of the Proposal will not adversely affect the survival of this community.

#### Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting

No native vegetation representative of STIF will be directly cleared as a result of the Proposal. The Proposal may result in incidental trampling of STIF, and indirect impacts including changes in sedimentation and hydrology. However, these impacts are not expected to cause a substantial change in the species composition of STIF, and would only have minor impacts.

**Critically Endangered Ecological Community****Turpentine-Ironbark Forest of the Sydney Basin Bioregion**

**Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:**

**Assisting invasive species, that are harmful to the listed ecological community, to become established**

The Proposal has the potential to increase the presence of invasive species within the Survey Area given the importation of materials, personnel and machinery. However, this will be limited to the Subject Site and access roads where this community does not occur. With appropriate hygiene protocols as outlined within this report, the Proposal will not assist invasive species to become established.

**Causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community**

The Proposal will not involve the mobilisation of fertilisers, herbicides or other chemicals or pollutants into the STIF which has been designated as a No-Go Zone.

**Interfere with the recovery of an ecological community**

There is currently no recovery plan for this community. The Proposal is consistent with the conservation advice for STIF (Department of the Environment, 2014), as no direct clearing will occur. Furthermore, increased nutrient loading and sedimentation from urban runoff and stormwater discharge, a listed major threat for this community, will be improved in the long-term with the proposed stormwater mitigation works. As such, the Proposal will not interfere with the recovery of this community.

**Conclusion**

Under the EPBC Act, an action requires approval from the Australian Government Minister for Environment (the Minister) if the action has, would have, or is likely to have, a significant impact on a matter of national environmental significance such as the Critically Endangered, Turpentine-Ironbark Forest of the Sydney Basin Bioregion. The assessment above concludes that the Proposal will not have a significant impact on this community. As such, the Proposal does not require referral to the Minister for further assessment and approval under the EPBC Act.

## Appendix F. *Phytophthora* Hygiene Protocols

Task	Action
<b>Timing</b>	<p>When possible/practical, the development should be completed in dry soil conditions and postponed following significant rainfall. Working in dry soil conditions will reduce the need for cleaning vehicles and equipment.</p> <p>If it is necessary to work in wet or damp areas then greater attention will need to be spent on vehicle and equipment cleaning.</p>
<b>Staff</b>	<p>Contractors and staff involved in the development are to be made aware that fungus has / has not been recorded on site, and provided with information regarding management protocols and its threat to native vegetation.</p>
<b>Drainage and Water</b>	<p>Alterations to drainage that may result in the spread of <i>Phytophthora</i> into new areas are to be avoided as highest priority.</p> <p>Water used during construction should be minimised. When water is necessary, it should be from a reticulated mains system, bore supply or sterilised source. Surface water collected from infected areas should not be used.</p> <p>Water draining from the site should not to enter bushland areas.</p> <p>The use of water for dust suppression should be kept to a minimum.</p>
<b>Landscaping and Bush Regeneration</b>	<p>Plants used in landscaping should be purchased from a nursery with accreditation from the Nursery Industry Association, or from a nursery with excellent hygiene conditions. Species selected for landscaping should preferably be resistant to <i>Phytophthora cinnamomi</i>.</p> <p>Any gravel/sand/topsoil to be bought onto site should be purchased from a Nursery Industry Association accredited supplier, or should be certified (through testing) to be free of <i>Phytophthora cinnamomi</i>.</p> <p>Any infected soil/sand/gravel/vegetation moved on the site, or removed from the site should be stored at in area that is also infected with <i>Phytophthora cinnamomi</i>, or a site where the pathogen will not have any impact. Storage of gravel/sand/topsoil on site should preferably be on a dry well drained surface.</p> <p>Construction materials such as pipes, rocks, timber, bricks etc, should be free of mud and soil when arriving at the site.</p> <p>Staff should not enter infected areas unless necessary, movement within these areas should be kept to a minimum.</p>
<b>Vehicles and Machinery</b>	<p>All machinery, vehicles and equipment should arrive at the site free of uncontained mud and soil, particularly on tyres, mudflaps and the underbody.</p> <p>Vehicles and machinery exiting the site to be free of all uncontained mud and soil, particularly on the tyres, mudflaps and the underbody.</p> <p>Minimise the amount of water used. Try to remove soil and mud when it is dry (a stiff brush or stick maybe useful).</p> <p>Cleaning will be easier and more effective if it is completed at a depot or a permanent/designated cleaning area (it is acceptable for vehicles and machinery to be taken to a cleaning facility on sealed roads). If cleaning is to occur in the field select a site with a hard, well-drained surface (eg. a road) that is well away from remnant vegetation. If possible, wash down in an area that is close to the area you have been operating in. Wash down on ramps if possible. Do not allow mud and wash-down effluent to drain into bushland. Do not drive through wash-down effluent.</p>
<b>Footwear and Tools</b>	<p>Try to remove as much mud and soil as possible when it is dry with a stiff brush or stick. Minimise the amount of water used to initially clean footwear and tools.</p> <p>Footwear and tools should be scrubbed with a sterile solution (see below).</p> <p>All mud and soil should be collected (including in liquid) and removed in a bag or bucket. This material is to be disposed of at a site that is already infected with Cinnamon Fungus, or a site that contains no bushland.</p>
<b>Sterilising</b>	<p>Equipment can be sterilised by soaking in a disinfectant such as bleach (containing sodium hypochlorite). The bleach should be diluted (1 part bleach to 10 parts water), soak the tools for a few minutes, and then rinse. Alternatively methylated spirits can also be used for sterilising small hand tools and footwear in the field. A spray bottle containing methylated spirits can be used to cover all surfaces, allowing time for it to soak into all soil material (a couple of minutes is sufficient).</p> <p>A sterile water solution suitable for spraying down vehicles and machinery can be made by mixing 6mL of sodium hypochlorite (eg. pool chlorine or bleach) to every 10L of water.</p>