ECO SOLUTIONS
& MANAGEMENT

GRIFFIN SPORTS COMPLEX - STAGE 2
MNES ASSESSMENT REPORT

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ecosm.com.au
contact.team@ecosm.com.au

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Author(s):	Steve Marston / Meredith Watherston
Reviewed by:	Steve Marston
Approved by:	Steve Marston
Signed :	
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Symbols and Abbreviations

*	(Preceding a plant species name) plant species not native to Australia
BoM	Bureau of Meteorology
DAWE	Former (Commonwealth) Department of Agriculture, Water and the Environment
DCCEEW	(Commonwealth) Department of Climate Change, Energy, the Environment and Water
DoEE	Former (Commonwealth) Department of the Environment and Energy
DES	(Queensland) Department of Environment and Science
EPBC Act	(Commonwealth) *Environment Protection and Biodiversity Conservation Act 1999*
GPS	Global positioning system
ha	Hectares
km	Kilometres
MNES	Matters of national environmental significance (EPBC Act)
MSES	Matters of state environmental significance (EO Act)
NC Act	(Queensland) *Nature Conservation Act 1992*
NRM	(Queensland) Department of Natural Resources and Mines
RE	Regional Ecosystem as defined under the Queensland Vegetation Management Regulation 2000
SPRAT	Species Profile and Threats Database
TEC	Threatened Ecological Community
TSSC	Threatened Species Scientific Committee

Glossary

Term	Definition
Bioregion	A geographically distinct biological region, which is a reporting unit for assessing the status of native ecosystems and their level of protection. Australia is divided into 89 bioregions. Bioregions form part of the regional ecosystem classification code system. The project site area is located in the South East Queensland.
Endangered	Prescribed to a threatened ecological community or species under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* or Queensland *Nature Conservation Act 1992*.
EPBC Act conservation status	The *Environment Protection and Biodiversity Conservation Act 1999* lists species and communities: Extinct in the wild: ▪ It is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or ▪ It has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a timeframe appropriate to its life cycle and form. Critically Endangered: ▪ It is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria. Endangered: ▪ It is not critically endangered; and it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria. Vulnerable: ▪ It is not critically endangered or endangered; and ▪ It is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria. Migratory: ▪ Migratory species which are native to Australia and are included in the appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals Appendices I and II); ▪ Migratory species included in annexes established under the Japan-Australia Migratory Bird Agreement (JAMBA) and the Chine-Australia Migratory Bird Agreement (CAMBA); ▪ Native, migratory species identified in a list established under, or an instrument made under, an international agreement approved by the Minister, such as the Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).
MNES	A matter protected under the EPBC Act, including: ▪ World heritage properties ▪ National heritage places

Term	Definition
	▪ Wetlands of international importance ▪ Listed threatened species and ecological communities ▪ Migratory species ▪ Commonwealth marine areas ▪ The Great Barrier Reef Marine Park ▪ Nuclear actions ▪ A water resource, in relation to coal seam gas development and large coal mining development.
MSES	A matter of State environmental significance listed in Schedule 2 of the Queensland Environmental Offsets Regulation 2014 including: ▪ Regulated vegetation ▪ Connectivity areas ▪ Wetlands and watercourses ▪ High preservation areas of wild river areas ▪ Protected wildlife habitat ▪ Protected areas ▪ Highly protected zones of State marine parks ▪ Fish habitat areas ▪ Waterways providing for fish passage ▪ Marine plants ▪ Legally secured offset areas.
Regional ecosystem	A vegetation community within a bioregion that is consistently associated with a particular combination of geology, landform and soils.
Significant species and vegetation	Refers to: ▪ Species listed as critically endangered, endangered or vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* ▪ Threatened ecological community listed as critically endangered, endangered or vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
Threatened ecological community	A community listed under the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
Vulnerable	Prescribed to a threatened ecological community or species under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

1 Introduction

Eco Solutions & Management was engaged to undertake an assessment of the ecological values of the site of Stage 2 of the Griffin Sports Complex (GSC) in relation to relevant State and Local planning provisions. The GSC is located at the corner of Henry Road and Elizabeth Road, Griffin Qld 4503 and described as Lot 1 on RP30511, Lots 1 & 2 on RP85288 and Lot 415 on S31135.

This assessment of matters of national environmental significance (MNES) has specifically been prepared in support of a Referral to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) to determine whether Stage 2 of the GSC requires assessment against the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

1.1 Project background

On the 11 October 2016 Council endorsed the Griffin Sports Complex and Griffin Environmental Reserve Master Plan dated September 2015 (refer Appendix A). The approved Master Plan, which was informed by technical studies relating to a range of environmental, engineering and planning issues. The approved Master Plan provides for:

- the staged development of two sporting precincts (i.e. western and eastern precincts) within Lot 1 on RP30511, Lots 1 and 2 on RP85288 and Lot 415 on S31135
- retention, protection and enhancement of native vegetation external to the footprint of the sporting precincts
- establishment of the Griffin Environmental Reserve and nature based recreational activities in the southern precinct within Lots 2 and 3 on RP139690.

Stage 1 of the GSC (i.e. western precinct) has been progressed to the construction phase and is subject to its own approvals pathway. This MNES assessment report relates solely to Stage 2 of the GSC, which is located on Lot 415 on S31135 (the project site). A number of options for the layout of Stage 2 have been investigated, with final layout being specifically designed to minimise impacts to the environment whilst still achieving the desired community outcomes associated with the GSC (Figure 2). It should be noted that in response to environmental values within the project site, the footprint for Stage 2 of the GSC has been reduced from the conceptual layout in the approved Master Plan (Appendix A). The final layout for Stage 2 of the GSC consists of:

- district park comprising an area of 8,234 m²
- playground facilities
- six (6) x multipurpose courts
- amenities building
- one (1) artificial playing field

- clubhouse building
- four (4) sport fields
- entry road that will link via the existing Henry Road connection that is already provided through the developed western portion of the site
- approximately 380 vehicle parking spaces including circulation areas and bus drop off facilities.

It is proposed to construct the project in three stages as outlined below:

- Stage 1 – vegetation removal and offset planting
- Stage 2 – bulk earthworks
- Stage 3 – construction of sporting infrastructure.

The ecological values of the project site and broader Master Plan area, have been established through the following assessments:

- *Griffin Sports Complex – Stage 2 Ecological Assessment Report* (Eco Solutions & Management, 2022)
- *Griffin Sports Park – Stage 2, Ecological Constraints Assessment* (Ecological Survey & Management, 2019)
- *Flora and Fauna Survey – Griffin Sports Park and Griffin Environmental Reserve, Elizabeth Road Griffin* (Duke Environmental, 2016b)
- *Ecological Constraints and Opportunities Analysis – Elizabeth Road, Griffin* (Cardno 2012).

1.2 Scope of works

The following activities were required as part of this ecological assessment:

- identify, map and describe any threatened ecological communities (TECs) present that are listed under the EPBC Act
- assess the likelihood of occurrence and where possible identify significant species of flora and fauna and/or their habitats protected under the EPBC Act
- prepare an ecological assessment report for the project that:
  - describes and maps ecological values of the study area, with a particular focus on MNES listed under the EPBC Act
  - assesses the potential impacts of the project on MNES
  - provides mitigation and management strategies to reduce impacts on MNES
  - assesses the likely requirements for any offsets under the EPBC Act.

1.3 Project site description

The project site encompasses 36.8 ha of land in a peri-urban area and is bound by (Figure 2):

- the partially formed Elizabeth Road to the north
- coastal wetlands to the east and south
- cleared paddocks to the west.

Terrestrial portions of the site have been cleared in the past and have been until recently used for horse agistment. The central portion of the site also supports the Sid Bray model aircraft field that is managed by the 'Sports Aeromodellers Association Moreton Bay Region Incorporated'.

Terrestrial native vegetation is limited to scattered mature and regrowth eucalypts and Swamp Oak (*Casuarina glauca*). Lower-lying portions of the site along the eastern, southern and western boundaries that are subject to tidal influence support marine plant communities, namely saltmarsh, mangroves and Swamp Oak dominated vegetation. The tidally influenced Griffin Creek, extends along the western boundary of the site and discharges into, North Pine River approximately 400 m south of the site. A number of less-defined drainage features also extend through the north-eastern and eastern portions of the site that are associated with the coastal wetlands within and adjacent to the eastern boundary of the site.

There are significant coastal environments within the locality of the site (Figure 3), including:

- Moreton Bay Ramsar Wetland
- Moreton Bay Marine Park
- Hays Inlet Regional Park
- Griffin Environmental Reserve
- Hays Inlet Declared Fish Habitat area.

The Osprey House Environment Centre, which is owned and operated by Council, is located 400 m to the south of the site.

2 Regulatory framework

This ecological report has been prepared specifically to address MNES that occur within the project site and have the potential to be impacted by Stage 2 of the GSC. Therefore, the key piece of legislation considered in the preparation of this report is the Commonwealth's EPBC Act. Other matters of environmental significance (i.e. matters of state environmental significance (MSES)) will be referenced where relevant to provide the Commonwealth DCCEEW with sufficient information regarding the ecological values of the project site. Relevant pieces of legislation are further described below.

2.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act is the Commonwealth Government's principal piece of environmental legislation, and is administered by the DCCEEW. It is designed to protect national environmental assets; known as MNES, which include threatened species of flora and fauna, TECs, migratory species as well as other protected matters. Among other things, it defines the categories of threat for threatened flora and fauna, identifies key threatening processes to their survival and provides for the preparation of recovery plans for threatened flora and fauna.

Approval is required under the EPBC Act for any action (which includes a development, project or activity) that is likely to have a significant impact on MNES (including nationally threatened ecological communities and species, and listed migratory species).

2.1.1 International treaty obligations on migratory species

Australia is signatory to several agreements relating to migratory species. Migratory species listed under the following agreements and conventions are protected in Australia through being listed as MNES (Migratory Controlling Provision) under the EPBC Act:

- China–Australia Migratory Bird Agreement (CAMBA)
- Japan–Australia Migratory Bird Agreement (JAMBA)
- Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA)
- Convention on the conservation of migratory species of wild animals (Bonn Convention).

The JAMBA, CAMBA and ROKAMBA agreements list terrestrial, water and shorebird species which migrate between Australia and the respective countries. In all cases, the majority of listed species are shorebirds (DotE, 2016).

All agreements require the parties to protect migratory birds by:

- limiting the circumstances under which migratory birds are taken or traded
- protecting and conserving important habitats
- exchanging information

- building cooperative relationships.

The JAMBA agreement also includes provisions for cooperation on the conservation of threatened birds.

Australian Government and non-government representatives meet every two years with Japanese and Chinese counterparts to review progress in implementing the agreements and to explore new initiatives to conserve migratory birds (DotE, 2016).

The ROKAMBA formalises Australia's relationship with the Republic of Korea in respect to migratory bird conservation and provides a basis for collaboration on the protection of migratory shorebirds and their habitat (DotE, 2016).

In addition to these bilateral agreements, Australia is also a signatory of the Bonn Convention. This convention aims to conserve terrestrial, aquatic and avian migratory species throughout their range (CMS, 2016).

2.1.2 Commonwealth Environmental Offsets Policy

Under the EPBC Act Environmental Offsets Policy 2012 (EPBC Act Environmental Offsets Policy), environmental offsets are actions taken to counterbalance significant residual impacts on MNES. Offsets are used as a last resort in instances where an action will give rise to significant residual impacts, even after the application of management measures.

The EPBC Act Environmental Offsets Policy came into force in October 2012 and provides guidance on the role of offsets in environmental impact assessments and how DCCEEW considers the suitability of a proposed offset package (SEWPaC, 2012).

According to the policy, an offsets package is a "*suite of actions that a proponent undertakes in order to compensate for the residual significant impact of a project"* (SEWPaC, 2012). It can comprise a combination of direct offsets and other compensatory measures.

3 Methods

The current ecological values of the project site were assessed through a combination of a desktop review and site inspection, as detailed below.

3.1 Desktop assessment

The following desktop sources were used to review the ecological values of the site:

- Commonwealth's EPBC Act Protected Matters Search Report (PMST) (DAWE, 2022c)
- Queensland Government's:
    - Regulated Vegetation Management Map and Vegetation Management Supporting Map (DNRME, 2019)
    - Essential habitat mapping (DES, 2019b)
    - Koala habitat in South East Queensland Map (DES, 2019a)
    - Wildlife Online Database (DES, 2022)
    - 1:100,000 geology mapping (NRM, 2011)
    - Highest Astronomical Tide (HAT) (NRME, 2013)
- Non-government resources including:
    - Atlas of Living Australia (ALA) database (CSIRO, 2019)
    - Australasian Virtual Herbarium (AVH) database (CHAH, 2019)
    - aerial photography of the site.

A search area within 5 km of the site was used for PMST, Wildlife Online, ALA and AVH databases enquiries. Outputs from the Government database searches are provided in Appendix B.

3.2 Field methods

Field-validation of the ecological values the project site has been completed as part of the following assessments.

- Duke Environmental (2016) assessed the flora and fauna values of the entire GSC Master Plan area (including the project site) between 29, 30 and 31 March 2016. The field surveys included the following activities:
    - site walk over (20 daylight hours)
    - spotlighting (2 hours)
    - random meander searches for protected plant species
    - ground-truthing the location of mapped waterway in northern section of site

  - ground-truthing the location of saltmarsh communities
  - habitat and observational search for fauna species.

- Ecological Survey & Management (2019) conducted an inspection of the project site on the 18 June 2019. The site inspection was not a detailed survey of the ecological values of the site. Rather, the inspection focussed on confirming the location and extent of values that have been identified as part of the previous assessments by Cardno (2012) and Duke Environmental (2016). The site inspection involved the following activities:
  - assessing vegetation communities present using quaternary vegetation assessment sites in accordance with the Queensland Herbarium's methodology for mapping regional ecosystems (RE) (Neldner et al., 2017)
  - mapping the extent of marine plants within the site using a hand-held GPS (±5 m accuracy)
  - sampling non-juvenile Koala habitat trees within the site for signs of Koala habitation.

An additional survey was completed by Ecological Survey & Management on 8 October 2019 in order to survey and mark the location of Koala habitat trees that fall within the footprint for Stage 2 of the GSC.

Further site inspections were completed in June and July 2022 to map the actual HAT line as observed on-ground.

3.3 Fauna habitat assessment

The quality of fauna habitat in the project site was assessed on the basis of following criteria:

- **Low:** Many fauna habitat elements in low quality areas have been removed or altered such as mature, hollow-bearing trees, fallen timber and deep leaf litter. Remnants are often small in size, support substantial weed infestations of high or moderate threat weeds (e.g. Lantana [*Lantana camara*]) and are poorly connected to other areas of remnant vegetation.
- **Moderate:** Some habitat components are present but others are lacking. For example a remnant may have a reasonably intact understorey but lack mature canopy species and fallen timber. Some weed infestations are present but are relatively small in size or comprise species of low to moderate threat. Linkages with other remnant habitats in the landscape may be lacking or somewhat tenuous.
- **High:** Most habitat components are present (e.g. old-growth trees, fallen timber, lack of weeds and deep leaf litter), the remnant is large enough to support species that are typically associated with large intact areas of habitat (e.g. Powerful Owl [*Ninox strenua*] and Greater Glider [*Petauroides volans*]) and it is well connected or contiguous with other areas of native vegetation.

These criteria were adapted for treeless habitat types such as grasslands or wetlands as appropriate.

3.4 Likelihood of occurrence assessment

3.4.1 Ecological community assessment

The flora assessment was conducted across the study area at a scale and intensity to sufficiently identify if any Commonwealth TECs were present or likely to have been present in the study area. TECs not recorded during the field surveys were therefore considered to have a low likelihood to occur within the study area.

3.4.2 Significant species assessment

Database searches identified significant species that may potentially occur within the project site and surrounds. The likelihood of such species occurring was then assessed based on the results of the field assessment.

The likelihood of species occurring within the project site was classified using the criteria presented in Table 1. The assessment was based on the species' known ranges and habitat preferences, which were evaluated based on characteristics of the study are observed during the field assessment.

Table 1: Criteria to assess potential for significant species to occur in the project site

Likelihood to occur	Definition
Present	The species was recorded within the project site during the field assessment.
High	The species was not recorded within the project site during the field assessment, but is known to occur within the surrounding area/region, and habitat of suitable quality exists, within the project site
Moderate	The species was not recorded within the project site during the field assessment, although it is known to occur in the wider region. Habitat was identified for the species in the project site during the field assessment, however, it is marginal, fragmented and/or small in size, or degraded.
Low	The species was not recorded within the project site during the field assessment. The species is either: a) unlikely to occur in the wider region and due to the lack of, or due to poor quality habitat in the project site, the species is not expected to occur within the project site b) in the case of fauna, may forage periodically in the wider region and may overfly the project site, but the habitat in the project site is generally not suitable.

3.5 Limitations

The purpose of the field surveys was to identify the on-ground ecological features of the project site. Ecological surveys often fail to record all species of flora and fauna present on a site for a variety of reasons such as seasonal absence or

reduced activity during certain seasons. In addition, the ecology and nature of rare and/or cryptic species means that such species are often not recorded during short field visits. However, an assessment of habitat suitability is made for significant species that may occur in an area, thereby applying a precautionary approach.

4 Matters of National Environmental Significance

MNES identified within and adjacent to the project site as a result of the desktop review and field-validation surveys are illustrated in Figure 4 and are discussed further below. The PMST report did not identify any of the following MNES within 5 km of the site:

- world heritage properties
- national heritage places
- Commonwealth marine areas
- the Great Barrier Reef Marine Park.

Consideration of threatened and migratory fauna likely to occur within the project site excluded oceanic species (i.e. pelagic species such as whales, turtles, oceanic birds etc.) given the site does not encompass any open marine waters. Similarly, species listed solely as 'marine' under the EPBC Act were not considered as part of this assessment as the site is not located within or adjacent to a Commonwealth marine area.

4.1 Threatened ecological communities

4.1.1 Desktop results

The following TECs listed under the EPBC Act were returned from database searches:

- Lowland Rainforest of Subtropical Australia (Lowland Rainforest TEC) - critically endangered
- Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland (Swamp sclerophyll TEC) - endangered
- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland (Swamp Oak TEC) - endangered
- Subtropical and Temperate Coastal Saltmarsh (Saltmarsh TEC) – vulnerable.

4.1.2 Field-validated values

Two TECs have been confirmed within and adjacent the project site, namely the:

- Coastal saltmarsh TEC (Duke Environmental, 2016b; Ecological Survey & Management, 2019)
- Swamp Oak TEC (Ecological Survey & Management, 2019).

The extent of the Coastal Saltmarsh vegetation is illustrated in Figure 4 and generally coincides with the extent of HAT, which is typically a reliable indicator of the landward extent of saltmarsh vegetation. With reference to the approved conservation advice (DSEWPAC, 2013), this vegetation is considered to form part of the Coastal Saltmarsh TEC given that the community is:

- within the latitudinal range of the TEC
- associated with the Hays Inlet and North Pine River estuarine systems
- associated with coastal clay plains that are tidally influenced
- characterised by a mosaic of bare substrate and dense to patchy areas of characteristic coastal saltmarsh plant species such as Saltcouch (*Sporobolus virginicus*), Bead Weed (*Sarcocornia quinqueflora*) and Seablite (*Suaeda australis*)
- characterised by a less than 50% cover of tree canopy such as mangroves and Swamp Oak and no seagrass is present.

Approximately 5.9 ha of Coastal Saltmarsh TEC have been mapped within the project site (Figure 4).

The project site supports fragmented patches of Swamp Oak dominated vegetation. However, the majority of these patches are less than 0.5 ha and therefore do not meet the minimum patch size to be considered part of the Swamp Oak TEC (TSSC, 2018). There is one polygon of Swamp Oak dominated vegetation to the east of the site, a small portion of which extends into the site, which is greater than 0.5 ha in area and is likely to satisfy the criteria to be considered a part of this TEC (TSSC, 2018)(Figure 4). This polygon of vegetation was not examined in detail during the 2019 site inspections by Ecological Survey & Management as this vegetation is included in the 'environmental protection and rehabilitation' zone of the approved Master Plan. For the purposes of this report a precautionary approach has been adopted and this patch of vegetation will be treated as forming part of the Swamp Oak TEC. Approximately 0.1 ha of Swamp Oak TEC has been mapped within the project site (Figure 4).

None of the remaining vegetation communities within the project site have the structural or floristic elements of any TECs listed under the EPBC Act.

4.2 Threatened flora species

4.2.1 Desktop results

The following 14 threatened flora species were returned from database searches.

Critically endangered species

- Scrub Turpentine (*Rhodamnia rubescens*)
- Native Guava (*Rhodomyrtus psidioides*)

Endangered species:

- Lesser Swamp-orchid (*Phaius australis*)

Vulnerable species

- Austral Toadflax (*Thesium australe*)
- Hairy-joint Grass (*Arthraxon hispidus*)

- Leafless Tongue-orchid (*Cryptocarya hunteriana*)
- Macadamia Nut (*Macadamia integrifolia*)
- Quassia (*Samadera bidwillii*)
- Rough-shelled Bush Nut (*M. tetraphylla*)
- Small-fruited Queensland Nut (*M. ternifolia*)
- Stinking Cryptocarya (*Cryptocarya foetida*)
- Three-leaved Bosistoa (*Bosistoa transversa*)
- Wedge-leaved Tuckeroo (*Cupaniopsis shirleyana*)
- Knotweed (*Persicaria elatior*).

4.2.2 Field-validated values

No threatened flora species were recorded during the site inspections undertaken by Duke Environmental (2016) or Ecological Survey & Management (2019).

Based on a review of database search results and habitat identified in the project site, an assessment of the likelihood of other EPBC Act listed threatened species occurring in the project site has been undertaken, and is provided in Appendix C. This assessment concluded that no threatened flora species listed under the EPBC Act are likely to occur within the project site given:

- the absence of suitable habitat, particularly complex rainforest communities
- there are no Wildlife Online or AVH records for any threatened flora species within 5 km search area.

4.3 Threatened fauna species

4.3.1 Desktop results

The following 36 threatened fauna species were returned from database searches.

Critically endangered species:

Birds

- Curlew Sandpiper (*Calidris ferruginea*)
- Eastern Curlew (*Numenius madagascariensis*)
- Great Knot (*Calidris tenuirostris*)
- Regent Honeyeater (*Anthochaera phrygia*)
- Swift Parrot (*Lathamus discolor*)

Insects

- *Australian Fritillary (Argynnis hyperbius inconstans)*

Endangered species:

Amphibians

- Fleay's Frog (*Mixophyes fleayi*)

Birds

- Australasian Bittern (*Botaurus poiciloptilus*)
- Australian Painted Snipe (*Rostratula australis*)
- Coxen's Fig Parrot (*Cyclopsitta diophthalma coxeni*)
- Lesser Sand Plover (*Charadrius mongolus*)
- Red Knot (*Calidris canutus*)

Mammals

- Greater Glider (*Petauroides volans*)
- Koala (*Phascolarctos cinereus*)
- Northern Quoll (*Dasyurus hallucatus*)
- Spot-tailed Quoll (*Dasyurus maculatus maculatus*)

Insects

- Pink Underwing Moth (*Phyllodes imperialis smithersi*)

Vulnerable species:

Amphibians

- Giant Barred Frog (*Mixophyes iteratus*)

Birds

- Australian Fairy Tern (*Sternula nereis nereis*)
- Black-breasted Button-quail (*Turnix melanogaster*)
- Greater Sand Plover (*Charadrius leschenaultii*)
- Grey Falcon (*Falco hypoleucos*)
- Painted Honeyeater (*Grantiella picta*)
- Red Goshawk (*Erythrotriorchis radiates*)
- South-eastern Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami*)
- Squatter Pigeon (southern)(*Geophaps scripta scripta*)
- Western Alaskan Bar-tailed Godwit (*Limosa lapponica baueri*)
- White-throated Needletail (*Hirundapus caudacutus*)

Mammals

- Ghost Bat (*Macroderma gigas*)

- Grey-headed Flying-fox (*Pteropus poliocephalus*)
- Large-eared Pied Bat (*Chalinolobus dwyeri*)
- Long-nosed Potoroo (*Potorous tridactylus tridactylus*)
- Water Mouse (*Xeromys myoides*)
- Yellow-bellied Glider (south-eastern) (*Petaurus australis australis*)

Reptiles

- Collared Delma (*Delma torquata*)
- Three-toed Snake-tooth Skink (*Saiphos reticulatus*).

A number of oceanic species, i.e. Shearwaters, Albatross, Frigatebirds, Tropicbirds and Petrels, cetaceans, sharks and turtles, were also returned from the database searches (Appendix B). However, this assessment considers terrestrial species only as the project site does not support oceanic habitat suitable for these species.

4.3.2 Field-validated values

The Koala is on the only threatened fauna species that has been recorded in the project site. Based on the results of the database searches and habitat types present within and adjacent to the project site, the following EPBC Act listed fauna species are also considered to have a moderate or high likelihood of occurrence (Appendix C):

- threatened migratory shorebirds, namely Curlew Sandpiper, Eastern Curlew, Great Knot, Lesser Sand Plover, Red Knot, Greater Sand Plover and Western Alaskan Bar-tailed Godwit
- Grey-headed Flying-fox
- White-throated Needletail
- Water Mouse

These species are discussed in further detail below.

4.4 Koala

Species overview

The Koala is widespread in sclerophyll forest and woodland on foothills and plains on both sides of the Great Dividing Range from about Chillagoe in Queensland to Mt Lofty Ranges in South Australia (Menkhorst and Knight 2011). In Queensland the species is thought to occur in eight bioregions; Einasleigh Uplands, Wet Tropics, Desert Uplands, Central Mackay Coast, Mitchell Grass Downs, Mulga Lands, Brigalow Belt North and Brigalow Belt South. In many locations Koalas are of low density, widespread and fragmented (DAWE, 2022b).

Koalas in Queensland use a range of habitats, including moist coastal forests, southern and central western sub-humid woodlands, and a number of eucalypt woodlands adjacent to waterbodies in the semi-arid western parts of the state

(DAWE, 2022b). The diet of this species is restricted to the foliage of *Eucalyptus*, *Corymbia* and *Angophora* species, and may comprise as few as two preferred tree species in any given location (DAWE, 2022b). The abundance of primary food trees is thought to influence the density of Koalas in a population (Phillips & Callaghan, 2011).

Home ranges for this species have been found to be highly variable and dependant on life history stage, soil fertility, habitat quality and nutritional requirements whereby home ranges can vary between 3 and 500 ha in different locations (DAWE, 2022b).

Habitat modelling, described in the *Conservation Advice for Phascolarctos cinereus (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory* (Koala Conservation Advice), has shown that habitats for this species occur where the mean maximum summer temperatures are 23-26^{o}C and mean annual rainfall between 700 and 1500 mm. Modelling also showed that Koala occupancy is strongly dependent on annual rainfall and the distance to water features (DAWE, 2022b). The DAWE describes refuge habitat as patches that are resilient to drying conditions due to favourable hydrological systems, e.g. drainage lines and riparian zones (DAWE, 2022b).

Presence and habitat in the study area

PRESENT

There are 3,121 Wildlife Online records for this species within 5 km of the project site. No Koalas were directly observed in the project site during the field surveys completed by Duke Environmental (2016) or Ecological Survey & Management (2019). However, an individual was located during the 2022 HAT survey in the north-west portion of the site and potential Koala scats and scratch marks were recorded during the detailed survey of Koala habitat trees within the Stage 2 footprint. A more in-depth analysis of Koala records and activity in the Griffin area was undertaken.

As part of this analysis, it was revealed that at least two Koalas that were being tracked and monitored as part of the Moreton Bay Rail Koala Management Program move through the project site (Hanger et al. 2017; B. Nottidge pers. comm. 2019). More specifically, the Koalas had been released into the Department of Transport and Main Roads' Griffin offset planting site, located on Wagner Road approximately 1.3 km to the south-west of the project. Two of the translocated individuals were found to move from the Griffin offset site in a north-easterly direction, through Lot 2 on RP85288 that adjoins the western boundary of the project site and into more intact woodland vegetation associated with the unformed portion of Elizabeth Road and adjoining properties to the north (e.g. River Breeze Drive Park) (Appendix D and Figure 5).

With reference to Figure 5, the portions of the GSC Master Plan area that are currently being used by dispersing Koalas are in a degraded state with tracts of cleared land and sparsely distributed mature trees. Koalas are at more risk from threats such as dog attack when travelling along the ground. It is anticipated that Koalas will continue to move into and use habitat to the north of the project site given that:

- Council has no intention to construct the full extent of the Elizabeth Road road reserve in the next 10 years
- bushland in private properties to the north of Elizabeth Road is identified for retention as parkland in the current development application that has been submitted for this property (DA/29754/2014/VCHG/1)
- the extent of Koala habitat in the broader Griffin area has been substantially reduced through historic and ongoing urban development.

Koala habitat within the project site consists of historically cleared land with scattered mature and regrowth Koala habitat trees. Queensland Blue Gum (*Eucalyptus tereticornis*) was the predominant Koala habitat tree recorded, with scattered mature Northern Grey Ironbark (*E. siderophloia*) in the south-western portion of the site, as well as the occasional Broad-leaved Paperbark (*Melaleuca quinquenervia*).

Woodland to the north of the project site is considered to be higher quality habitat given the greater density of Koala habitat trees and canopy overlap. Photographs of Koala habitat within and adjacent to the project site are provided as Appendix E.

A 2021 review of Koala habitat assessment criteria and methods by the Australian National University (ANU) lists locally important and ancillary habitat trees for the Koala by region (closely aligned with bioregions in Queensland). For the project site, Queensland Blue Gum and Northern Grey Ironbark have been listed as locally important Koala trees, and Broad-leaved Paperbark, Pink Bloodwood (*Corymbia intermedia*) and Swamp Box (*Lophostemon suaveolens*) have been listed as ancillary habitat trees in the South East Queensland Koala management bioregion within this review (Youngentob et al., 2021).

Due to the fragmented nature of the vegetation on the site resulting from historical disturbance, it is considered more accurate to represent Koala habitat in terms of the numbers of individual trees rather than an area of habitat. A total of 148 mature Koala habitat trees were mapped on the project site within the vicinity of the proposed sports complex. Additional mature Koala habitat trees are located on the project site that were not mapped as they are outside of the proposed disturbance area (Figure 6). In addition, 189 regrowth Koala habitat trees with a maximum diameter at breast height (DBH) of 15 cm were identified in four areas within the proposed disturbance area (Figure 6).

The Conservation Advice for the Koala discusses important populations and habitat critical to the survival of the Koala and provides the following advice, which is relevant to the project site.

Habitat critical to the survival of the Koala includes:

- habitat likely to be used during periods of stress (e.g. flood, drought or fire), due to the availability of locally important Koala habitat trees
- habitat used to meet essential life cycle requirements (e.g. foraging, breeding, nesting, roosting, social behaviour patterns), also given the presence of locally important Koala habitat trees and a degree of connectivity in the local landscape used by dispersal

- habitat used regularly by important populations
- habitat that is necessary for use as corridors to allow the species to move freely between sites used to meet essential life cycle requirements, which has been demonstrated as occurring within the project site (DAWE, 2022b).

It is therefore considered likely that the project site supports habitat critical to the survival of the Koala as it is known to support foraging.

The Conservation Advice lists state level important populations, including 'priority areas for management in South East Queensland'. The project site is located within a Priority Koala Assessable Development Area, and there is evidence that Koalas use the project site for dispersal, i.e. there are numerous records of Koalas within close proximity (i.e. 500 m to 5 km) of the project site (DES, 2022; CSIRO, 2022).

However, it should be noted that the project site is identified as being largely low value rehabilitation area and not quality bushland habitat within the Queensland State Planning Regulatory Provisions. Furthermore, the project site supports a disturbed open woodland that provides relatively low value habitat for the Koala at present because:

- the habitat is not large or well connected with other large areas of Koala habitat that support Koalas that are of sufficient size to be genetically robust or operate as viable sub-populations
- the south-east Queensland populations are not free of disease
- the connectivity provided by the project site is in a degraded state and Koalas currently need to traverse expanses of cleared ground.

4.5 Threatened migratory shorebirds

Species overview

All of the threatened shorebird species returned from the database searches are non-breeding migrants to Australia (Geering et al., 2007). They are typically associated with coastal areas around Australia, although some species such as the Curlew Sandpiper are also known to occur inland (Geering et al., 2007; DoEE, 2019ae). Shorebird species mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours. They usually forage in soft substrate near the edge of water on intertidal mudflats or sandflats exposed by low tide (Geering et al., 2007; DoEE, 2019ae). The majority of species roost on sandy beaches, spits and islets, and mudflats. However, some species such as Curlew Sandpiper, Eastern Curlew and Greater Sand Plover occasionally roost in saltmarsh and/or mangroves (Geering et al., 2007; DoEE, 2019ae).

Likelihood to occur within the project site

HIGH

The coastal saltmarsh community within the project site provides potential foraging habitat for threatened shorebirds returned from database searches. There are numerous Wildlife Online and ALA records for all of these species within

5 km of the project site. There is also the potential for species such as Curlew Sandpiper, Eastern Curlew, Lesser Sand Plover, Greater Sand Plover and Western Alaskan Bar-tailed Godwit to roost in coastal saltmarsh and mangrove vegetation within the project site. Photographs of coastal wetland habitat within the project site are provided in Appendix E.

The Moreton Bay Regional Council Shorebird Habitat Mapping Project (Milton & Denning, 2009) identified a clay plain to the east of the Bruce Highway on the northern side of Pine River as a critical roost site for shorebirds foraging in the Hays Inlet and Bramble Bay areas. This roost site is located approximately 2 km to the south-west of the project site and coastal wetlands to the east of the project site were also identified by the Shorebird Habitat Mapping Project as potential shorebird roosting habitat.

In addition to the above, the project site is in close proximity to the Moreton Bay Ramsar Wetland, which is widely recognised for its migratory shorebird habitat values. While no migratory shorebirds have been recorded during the site inspections that have been completed (Duke Environmental, 2016b; Ecological Survey & Management, 2019), it is highly likely that migratory shorebirds use coastal wetland habitat within and adjacent to the project site. It is noted that the presence of shorebirds can be influenced by seasonality and tidal regimes, which may explain the absence of shorebirds during the surveys that have completed across the site.

Approximately 10.6 ha of coastal wetland habitat consisting primarily of mangrove and saltmarsh communities with interspersed or fringing Swamp Oak forest below HAT has been mapped within the project site (Figure 6).

4.6 Grey-headed Flying-fox

Species overview

The Grey-headed Flying-fox is a canopy-feeding frugivore and nectarivore, usually feeding on rainforest, open forest, closed and open woodland communities as well as Melaleuca swamps and Banksia woodlands. It will also feed on fruit crops and other introduced tree species. Its primary food source is the blossom of *Eucalyptus* (and related genera) (DoEE, 2019aa). Camps are generally in rainforest patches, stands of Melaleuca, mangroves and riparian vegetation located near water, such as lakes, rivers or the coast (DoEE, 2019aa).

Likelihood of occurrence

HIGH

The Redcliffe Botanic Gardens, located approximately 7 km north-east of the project site, supports a flying fox camp that is regularly used by Grey-headed Flying-fox (Moreton Bay Regional Council, 2019; DoEE, 2019w). It is therefore highly likely that Grey-headed Flying-fox feed on eucalypts (when in flower) within the site during broader movements throughout the locality. Duke Environmental (2016) recorded flying foxes during nocturnal surveys, but the species was not identified at the time. No roost sites were observed within or adjacent to the site

during the site inspection. Further, there are no historic records for roosts within or adjacent to the site.

Approximately 13.4 ha of potential forage habitat for this species has been mapped within the project site (Figure 6).

4.7 White-throated Needletail

Species overview

This species is a non-breeding migrant in Australia that is almost exclusively aerial and occurs over forests, woodlands, farmlands, plains, lakes and towns (Pizzey et al., 2012). It is known from above mainly wooded areas, and larger tracts of vegetation, particularly forest. The species roosts primarily in dense foliage and tree hollows typically in tall trees on ridge-tops, on bark or rock faces (DoEE, 2019q). Large tracts of forest vegetation and breeding habitat is considered important in Australia (DoEE, 2019q).

Likelihood to occur within the project site

HIGH

This species has not been recorded during field surveys completed across the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019). However, there are 15 Wildlife Online records for this species within 5 km of the project site. There is a moderate likelihood that the White-throated Needletail could overfly and use the entire project site as part of wider foraging movements. There is no evidence of traditional roost sites within the project site. It is considered unlikely that the project site provides important habitat for this species as large tracts of forest vegetation and roosting habitat are not present within or adjacent to the project site.

4.8 Water Mouse

Species overview

This species occurs in the Northern Territory, central south Queensland and south-east Queensland (DoEE, 2019ah). The species is known to occur in mangroves, saltmarsh, sedgelands, claypans, heathlands and freshwater wetlands. The species has been known to nest or forage in a limited number of REs on land zones 1 and 2 in the Central Queensland Coast, Brigalow Belt and South-east Queensland Bioregions (DoEE, 2019ah). The varying vegetation structure at each of their three broad locations dictates their preferred nesting behaviour (DoEE, 2019ah).

Likelihood to occur within the project site

MODERATE

Coastal wetlands supporting mangrove and saltmarsh communities have the potential to provide habitat for the Water Mouse. While there are no Wildlife Online records for this species within 5 km of the site, this species is typically associated with coastal wetland habitats similar to that in the project site and nearby

adjoining Hays Inlet Conservation Park (DoEE, 2019ah). Habitat modelling indicates that the project site is located in an area where this species is considered likely to occur (DoEE, 2019ah).

Approximately 10.6 ha of coastal wetland habitat consisting primarily of mangrove and saltmarsh communities with interspersed or fringing Swamp Oak forest below HAT, has been mapped within the project site (Figure 6).

4.9 Migratory species

4.9.1 Desktop results

Database searches identified the following additional 42 bird species listed as migratory under the EPBC Act as potentially occurring within the project site (Appendix B):

- Asian Dowitcher (*Limnodromus semipalmatus*)
- Bar-tailed Godwit (*Limosa lapponica*)
- Barn Swallow (*Hirundo rustica)*
- Black-faced Monarch (*Monarcha melanopsis*)
- Black-tailed Godwit (*Limosa limosa*)
- Broad-billed Sandpiper (*Limicola falcinellus*)
- Caspian Tern (*Hydroprogne caspia*)
- Common Greenshank (*Tringa nebularia*)
- Common Noddy (*Anous stolidus*)
- Common Sandpiper (*Actitis hypoleucos*)
- Common Tern (*Sterna hirundo*)
- Crested Tern (*Thalasseus bergii*)
- Double-banded Plover (*Charadrius bicinctus*)
- Fork-tailed Swift (*Apus pacificus*)
- Glossy Ibis (*Plegadis falcinellus*)
- Grey Plover (*Pluvialis squatarola*)
- Grey-tailed Tattler (*Tringa brevipes*)
- Gull-billed Tern (*Gelochelidon nilotica*)
- Latham's Snipe (*Gallinago hardwickii*)
- Little Curlew (*Numenius minutus*)
- Little Tern (*Sternula albifrons*)
- Marsh Sandpiper (*Tringa stagnatilis*)

- Oriental Cuckoo (*Cuculus optatus*)
- Oriental Plover (*Charadrius veredus*)
- Osprey (*Pandion haliaeetus*)
- Pacific Golden Plover (*Pluvialis fulva*)
- Pectoral Sandpiper (*Calidris melanotos*)
- Pin-tailed Snipe (*Gallinago stenura*)
- Red-necked Stint (*Calidris ruficollis*)
- Ruddy Turnstone (*Arenaria interpres*)
- Ruff (*Philomachus pugnax*)
- Rufous Fantail (*Rhipidura rufifrons*)
- Sanderling (*Calidris alba*)
- Satin Flycatcher (*Myiagra cyanoleuca*)
- Sharp-tailed Sandpiper (*Calidris acuminata*)
- Spectacled Monarch (*Monarcha trivirgatus*)
- Swinhoe's Snipe (*Gallinago megala*)
- Terek Sandpiper (*Xenus cinereus*)
- Wandering Tattler (*Tringa incana*)
- Whimbrel (*Numenius phaeopus*)
- White-winged Black Tern (*Chlidonias leucopterus*)
- Wood Sandpiper (*Tringa glareola*).

A number of oceanic species, i.e. Shearwaters, Albatross, Frigatebirds, Tropicbirds and Petrels, cetaceans, sharks, turtles, rays and fish, were also returned from the database searches (Appendix B). However, this assessment considers terrestrial species only as the project site does not support oceanic habitat suitable for these species.

4.9.2 Field-validated values

Similar to the threatened migratory shorebird species discussed in Section 3.3.2, listed migratory shorebirds are also highly likely to use coastal wetland habitats in the project site (Figure 6). More specifically, the project site provides potential forage habitat for Asian Dowitcher, Common Greenshank, Common Sandpiper, Bar-tailed Godwit, Black-tailed Godwit, Gull-billed Tern, Crested Tern, Caspian Tern, White-winged Black Tern, Broad-billed Sandpiper, Double-banded Plover, Grey Plover, Grey-tailed Tattler, Little Curlew, Marsh Sandpiper, Oriental Plover, Pacific Golden Plover, Pectoral Sandpiper, Red-necked Stint, Ruddy Turnstone, Ruff, Sanderling, Sharp-tailed Sandpiper, Terek Sandpiper, Wandering Tattler, Whimbrel and Wood Sandpiper. Apart from the Ruff, all of these species have been

recorded within 5 km of the project site, many of them have been recorded at the North Pine River roost site (Milton & Denning, 2009).

The Osprey is also highly likely to overfly the project site. A resident pair of this species is associated with and regularly uses the raptor nesting platform at the Osprey Environmental Centre, located 400 m to the south of the project site. However, the project site does not support extensive areas of open water that this species requires for foraging (DoEE, 2019x).

There is also a moderate likelihood that the Fork-tailed Swift would overfly the project site. This non-breeding visitor to Australia and is almost exclusively aerial, typically foraging over open habitats however, sometimes it also occurs above rainforests, wet sclerophyll forest or pine plantations and cities (DoEE, 2019b).The remaining migratory species are considered unlikely to occur within the project site based on the absence of suitable habitat, particularly sandy beaches, freshwater wetlands and more complex vegetation communities such as wet sclerophyll forest and rainforest, and/or a lack of records in the search area. The project site is not within the typical distribution of the Barn Swallow, which occurs further to the north.

4.10 Wetlands of international importance

As noted in Section 1.3, the project site occurs in close proximity to the Moreton Bay Ramsar Wetland of International Importance (Figure 3).

The Moreton Bay Ramsar Wetland all nine criteria for the designation of wetlands of international importance. It is notable for its large size, diversity of wetland habitats, connectivity between wetland types, as well as diverse flora and fauna that includes threatened species and ecological communities. It contains seagrass, sandy and muddy tidal flats and subtidal areas, saltmarsh, mangroves and coral communities, freshwater wetlands, as well as ocean beaches and dunes (DoEE, 2019c). The site regularly supports more than 50,000 waterbirds, representing at least 43 species of shorebirds and at least 28 migratory shorebird species. The site is recognised as a network site under the East Asian-Australasian Flyway Partnership (site code EAAF013) and supports over 1% of the estimated flyway population of at least nine migratory shorebird species, including Eastern Curlew and Curlew Sandpiper (DoEE, 2019c).

Coastal wetlands within the project site do not form part of the mapped extent of the Moreton Bay Ramsar wetland. However, the project site drains into this important wetland and coastal wetlands are likely to be used by migratory birds and other fauna as they disperse throughout the locality.

5 Impact assessment

This section presents an assessment of the likely impacts of Stage 2 of the GSC on terrestrial ecology with a focus on MNES either recorded within the project site during the field surveys or considered to have a moderate to high likelihood of occurrence due to the presence of suitable habitat.

5.1 Direct impacts

Direct impacts associated with Stage 2 of the GSC include vegetation clearing and landform modification in order to establish the sporting precinct. More specifically, all vegetation will be cleared from the Stage 2 footprint and placement of fill will be required to achieve flood immunity. For the purposes of this assessment, it has been assumed that the extent of disturbance will be limited to the periphery of the sports fields, kick-around area, southern car-park, tennis and netball courts, playground area, access road and northern car park (Figure 7).

The layout for Stage 2 of the GSC has been specifically designed to avoid impacts to MNES as far as practicable. More specifically, the footprint for Stage 2 has been reduced in size from the original Master Plan and avoids direct impacts to all areas of coastal wetland within the project site (Figure 7). Direct impacts associated with Stage 2 of the GSC will affect 9.6 ha or 26 % of the project site area. It is noted that there may be opportunities to further reduce the impact footprint of Stage 2 of the GSC during the detailed design phase of the project.

Direct impacts to MNES identified within the project site or assessed as having a moderate to high likelihood of occurrence are summarised in Table 2 below.

Table 2: Direct impacts to MNES associated with Stage 2 of the GSC

Matter of national environmental significance	Likelihood of occurrence	Area of habitat (ha)		% of habitat in project site to be disturbed
		Project site	Stage 2 footprint	
Threatened ecological communities				
Coastal saltmarsh TEC	Present	5.9	0.01	0.2
Swamp Oak TEC	Present	0.1	0.0	0
Threatened fauna species				
Koala	Present	148 mature trees & 189 regrowth trees plus additional trees not mapped	136 mature trees and 189 regrowth trees to be removed	92% of mapped mature trees to be removed & 100% of mapped regrowth trees to be removed

Matter of national environmental significance	Likelihood of occurrence	Area of habitat (ha)		% of habitat in project site to be disturbed
		Project site	Stage 2 footprint	
Shorebirds	High	10.6	0.0	0
White-throated Needletail[1]	High	36.8	9.6	26
Grey-headed Flying Fox	High	13.4	8.3	62
Water Mouse	Moderate	10.6	0.0	0
Migratory species				
Shorebirds	High	10.6	0.0	0
Osprey	High	10.6	0.0	0
Fork-tailed Swift[1]	Moderate	36.8	9.6	26

[1]These species are likely to overfly and forage aerially above the project site, no roosting habitat is present.

5.2 Indirect impacts

Indirect impacts associated with construction and/or operation of Stage 2 of the GSC include waste, noise, light pollution, vehicle strike, erosion and sedimentation, acid sulfate soils, water quality, introduction or spread of invasive fauna and flora species, including domestic dogs.

The following sections provide further details regarding these indirect impacts and the proposed management measures.

5.2.1 Impact mitigation

Measures to avoid impacts

A number of assessments have been completed across the project site to inform the detailed design of Stage 2 of the GSC. As discussed above, to minimise direct impacts to sensitive environments the layout for Stage 2 has been reduced in size and located wholly outside of tidally influenced areas of the site. This has resulted in the retention and protection of all areas of coastal wetland habitats within the project site In addition, the layout has been configured in a manner to avoid impacts to Koala and Grey-headed Flying-fox habitat as far as practical.

Measures to manage indirect impacts during the construction phase

In comparison to the operational phase of the project, the construction phase of will be short in duration. However, due to activities such as vegetation clearing, excavation and filling, the highest risk of environmental harm will be associated

with the construction phase of the project. A Construction Environmental Management Plan (CEMP) (Duke Environmental, 2016a) has been prepared to minimise and manage unavoidable impacts during the construction of Stage 2.

Erosion and sediment management

Clearing of vegetation and placement of fill increases the risk of erosion and sediment movement from the disturbance footprint into the receiving environment. EP004 of the CEMP (Duke Environmental 2016b) specifies that the following measures shall be implemented to control erosion and to prevent discharge of sediment contaminated runoff to receiving environments during construction activities.

- Preparation and implementation of site specific erosion and sediment control plans.
- Where possible, earthworks shall be completed in stages, such that a minimal area of ground is open at any one time.
- Perimeter bunds shall be constructed around disturbed areas to divert external catchment flows around these areas.
- The Contractor shall provide temporary control measures as required during the course of the work to prevent soil erosion, scouring, sediment transport and deposition. Suitable temporary control measures, as identified in the International Erosion Control
- Association Best Practice Erosion and Sediment Control 2008 (IECA Manual), include but are not limited to:
    - temporary retardation basins
    - temporary sediment fences
    - temporary sedimentation ponds/traps.
- Fertiliser application rates shall be monitored to ensure that excess material is not washed off by stormwater runoff and discharged to downstream water bodies. Controlled-release fertilisers shall be used wherever possible. Retardation basins or other sediment capture devices shall be maintained downstream of disturbed areas until revegetation is judged to be suitably advanced to limit soil erosion.

Stormwater quality

Poor urban stormwater quality contributes to significant water quality decline within receiving waterbodies. While there are many potential causes of water contamination, high concentrations of pollutants in stormwater are often from sediment from land development sites. More than 85% of sediment that leaves an urban development site does so during the construction phase, with lower levels of sediment occurring during the operational phase of a development (DERM, 2010). In addition to the erosion and sediment control measures discussed above, EP005 of the CEMP (Duke Environmental 2016b) specifies that the following

measures shall be implemented to minimise the impact of construction activities on water quality in the receiving environment:

- Materials stored on site shall be placed in suitably prepared locations, so as to limit the potential for suspended solids to be transported from the site. Existing runoff paths will be diverted around these storage locations, and bunds/fences shall be provided to retain material.
- Fuels and oils shall be stored in safe locations (with bunds as required by relevant Standards and Guidelines) where stormwater inundation is unlikely to occur. Any spillages of fuel and oil within the compound shall be attended to immediately to limit the potential for off-site impacts.
- As it is an offence under the Environmental Protection Policy (Water) (EPP), the Contractor is not to deposit or release any of the following into, or in a place where it is likely to wash into, a water way, a roadside gutter or a storm-water drain:-sand, silt and/or mud
    - rubbish, building waste and/or sawdust
    - waste water
    - cement or concrete
    - oils, fuels and/or solvents
    - insecticides, herbicides, fungicide and/or other biocides.
- Water quality of on-site sediment basins is to be monitored prior to release. In accordance with the EPP 2009, Pine Rivers and Redcliffe Creek environmental values and water quality objectives, Basin No. 142 (part), including Hays Inlet and all tributaries of the North Pine and South Pine Rivers, no release of waters from site is to occur unless criteria specified in Table 5.1 are met. Note that site specific criteria for pH values, based on sampling of the receiving environment, must be determined prior to commencement on site.

The project site supports mangroves and saltmarsh that provide habitat for the Saltmarsh Mosquito (*Aedes vigilax*). The CEMP provides a number of non-insecticide based measures to control and reduce mosquitoes within the construction footprint. These measures reduce the risk of insecticides being leached or mobilising into the receiving environment and include:

- removing all containers providing breeding pits (e.g. tyres, drums, other containers deposited as rubbish).
- levelling final surface finish to avoid water ponding (including final levels of stormwater swales).
- limiting vehicle movement to compacted vehicle tracks to reduce road holes that may contain water
- removing or filling in wheel ruts that form on site at the end of each day,.

- advising staff during site induction of potential for mosquito attack and requirement to use appropriate PPE and insect repellent.

Dust

Dust is likely to be generated by vegetation clearing, and placement of fill within the Stage 2 footprint. Dust deposition on vegetation can reduce growth and palatability of foliage. EP004 of the CEMP (Duke Environmental 2016b) specifies a number of measures to manage air quality, including dust, during construction activities. Specifically there are measures for:

- Management of dust generation in general including reasonable and practicable measures such as:
  - restriction of vehicular movement within the site to designated access routes
  - minimisation of exposed surface area, to that within the current areas of operation
  - rehabilitation of completed areas as soon as reasonable and practicable, following completion of excavation or other earthworks
  - transfer of materials in a moist state where possible
  - use of water cart(s) as necessary on site access roads
  - sealing of trafficable areas.
- Management of stockpiles including reasonable and practicable measures such as:
  - Operation of effective water spray systems during winds likely to generate such releases towards neighbours
  - Use of dust suppressant shielding;
  - Orientation of stockpile/s with respect to direction of prevailing winds
  - Storage in bunkers and covering with tarpaulins
  - Minimisation of stockpile sizes and stabilisation of stockpile areas
  - Maintenance of stockpiles within designated areas and prevention of spread of stockpile material into adjacent areas
  - Creation of the minimum number stockpiles that are necessary, and removal of all stockpiles upon completion of works on site.
- Management of trafficable areas, including reasonable and practical measures such as
  - Sealing with bitumen or other suitable material
  - Using water sprays;
  - Adopting and adhering to speed limits; and

  - Using dust suppressants and wind breaks.
  - Use of guide posts and/or other control measures to define trafficable areas and restrict the movement of vehicles on exposed surfaces and/or environmentally sensitive areas.

- Management of dust and other particulate matter during transit, including reasonable and practical measures such as securing loads, wetting down or covering loads, cleanliness of tyres prior to leaving site and clean-up of deposited materials on public roads.

Noise

Noise generated by construction vehicles and machinery has the potential to deter fauna from using habitat within the vicinity of the construction footprint. EP009 of the CEMP (Duke Environmental 2016b) specifies that the following measures shall be implemented to minimise the impact of noise during construction activities:

- All noise generating mobile and stationary plant and equipment, and processes shall be controlled to minimise noise emission in accordance with AS2436 - Guide to noise and vibration control on construction, demolition and maintenance sites.
- Control measures may include, but not be limited to:
  - the fitting of effective residential grade exhaust silencers to all mobile plant
  - the fitting of engine acoustic shielding
  - using exhaust silencers on compressed air exhausts
  - the use of physical noise barriers such as earth mounds or mobile screens
  - review of times of operation of plant
  - other mitigation measures will be complaint driven.
- Lighting devices shall be used instead of whistles, bells and buzzers to control site operations. Audible alarms shall only be used for safety warnings.
- In addition, all vehicles leaving or entering the site, or used within the site, shall be operated and maintained in a manner which ensures that the noise levels produced by the vehicles are within the limits of the Commonwealth Australian Design Rule ADR83/00- External Noise.
- In the event of the adjusted noise level for a single noise source or activity exceeding the maximum noise level by more than 10 dB(A), consideration shall be given to restricting the times during which the activity can take place to a number of separate hours each day.

Waste management

Without appropriate management, construction waste has the potential to enter and degrade areas of retained habitat within the project site. EP002 of the CEMP (Duke Environmental 2016b) specifies a number of measures to manage waste during construction activities, including but not limited to the following:

- Within the site, the Contractor shall establish a Litter and Waste Control Plan, to manage the collection, storage and removal of all litter and waste on the site, whatsoever its origin. Trade wastes are to be handled and disposed of in accordance with the requirements of the relevant trade waste permit.
- All litter and waste, including pre-existing materials, construction wastes, human waste, used oils and any other surplus materials shall not be disposed of, nor burnt, on site.
- Specific areas shall be set aside for the storage of construction materials. In particular, a safe storage location for fuels and oils (if required to be stored on site) shall be provided in accordance with AS 1940 "The Storage and Handling of Combustible Liquids". This area shall be bunded in compliance with the standard and relevant requirements of authorities.
- The site is to be kept free from all wastes, especially those that may be exported from the site via wind or water. Lids of bins containing food waste must be kept closed at all times. Crows and Ibis inhabit the area and are known to transport waste from bins.
- All hazardous wastes shall be stored and disposed in accordance with the Safety Data Sheet (SDS). The SDS for all hazardous materials shall be kept on site at all times.
- The following hierarchy shall be followed:
  - (i) if practical, operations that produce waste are to be avoided (e.g. avoid over clearing of vegetation)
  - (ii) if practical, operations that produce waste are to be reduced (e.g. use most efficient machinery/operation for task).
  - (iii) if practical, wastes are to be re-used.
  - (iv) if practical, wastes are to be recycled (e.g. chip/mulch removed vegetation for use in landscaping/revegetation works).
  - (v) all solid and liquid wastes, being by-products of the Operational Works Phase, are to be collected in suitable vessels (skips/drums/bins etc) and disposed of in accordance with Local Authority requirements at Local Authority Approved land fill sites.

Acid sulfate soil management

Disturbance to acid sulfate soils can have a detrimental effect on the receiving environment through leaching of sulfuric acid and metals such as aluminium and

iron. EP006 of the CEMP (Duke Environmental 2016b) specifies a number of measures to manage acid sulfate soils during construction activities. Specifically there are measures for:

- the treatment of ASS prior to reuse (fill) or disposal including appropriate drying, handling and storage of ASS prior to liming, liming rates, sampling and testing, and appropriate use of ASS (i.e. not to be used in bunds or other diversion structures)
- management of excavated areas including isolation of acidic soils through bunding, liming and backfill with clean soil, and treatment of excavated areas left exposed for longer than two days
- management of stockpiles including locating of stockpiles to minimise leachate, design to minimise surface area exposure, isolation of stockpiles through bunding, time limits on stockpiling and liming of stockpile base pads
- dewatering, groundwater monitoring and catchment decommissioning.

Fauna management

There is the potential for unintentional harm to occur to fauna during vegetation clearing activities. Environmental Procedures 010 and 012 (EP010 and EP012) of CEMP (Duke Environmental, 2016a) provide management measures to be employed prior to vegetation clearing to minimise harm to native fauna. Specifically prior to the commencement of any vegetation clearing, the Contractor shall:

- identify all areas to be cleared on construction plans, and in the field. These areas will be clearly marked in the field, and vegetation outside this boundary will not be disturbed in any way without approval.
- undertake a survey of the vegetation in the clearance zones to identify individual native trees within the clearance zone that may be retained with minor, practicable modifications to the earthworks, and individual trees, or other specific vegetation outside the clearance zone that may require specific forms of protection.
- Prior to the commencement of vegetation clearing the site is to be inspected by a qualified spotter/catcher to identify any fauna (particularly koalas and possums) and/or nests or drays (that are currently being utilised by fauna) in vegetation to be cleared. Permits under the *Nature Conservation Act 1992* may be required in the event active nests/drays are identified. Vegetation containing wildlife is to be marked prior to clearing.
- Koala habitat, shall be identified to construction personnel prior to clearing.

EP010 and EP012 of the CEMP (Duke Environmental 2016b) also specify that during vegetation clearing, the following measures shall be implemented.

- A qualified spotter/catcher must be on site during vegetation clearing. All vegetation to be cleared is to be inspected by the spotter catcher prior to commencement of clearing activities.
- All trees to be lopped or felled shall first be checked for wildlife (e.g. Koalas, Possums, and Cockatoos). If any wildlife is present, the tree shall not be lopped until the animal has left the tree or been removed by a qualified spotter/catcher (not permitted for Koalas).
- All vegetation to be retained close to the road should be healthy and vigorous, with an expected lifespan of at least fifty (50) years. All individual trees and stands of vegetation will be subject to a risk assessment by a qualified Arborist if necessary.
- Any vegetation identified to contain wildlife is not to be cleared. The remainder of the vegetation may be cleared under the supervision of a suitably qualified and experienced spotter/catcher (not permitted for Koalas).
- Once the fauna has left the vegetation (or been trapped and released by a suitably qualified consultant, (not permitted for Koalas)) the vegetation may then be cleared.
- All animals caught on site are to be released locally into suitable habitat, unless otherwise advised.
- Fences shall be sited and constructed to allow the movement of fauna through, and within the site.
- No domestic pets shall be permitted on the site during construction.

In addition to the above, the project site is located in Koala District A under the *Nature Conservation (Koala) Conservation Plan 2017* (Koala Plan 2017). It is a requirement under the Koala Plan 2017 that native vegetation clearing is undertaken in a sequential manner and under the guidance of a Koala spotter where the native vegetation is a non-juvenile koala habitat tree. Under the Koala Plan 2017, where a site is greater than three hectares, clearing must be undertaken:

- in a manner that provides Koalas with enough time to move out of the site without human intervention
- in stages, with each stage involving the clearing of no more than 50% of the area
- where there is at least one 12-hour period that starts at 6 pm on one day and ends at 6 am on the following day during which no trees are cleared on the site.

If a Koala is located on the site during clearing activities, the following measures must be adopted:

- any tree in which a Koala is present, or which has a crown overlapping a tree in which a Koala is present, is not cleared (until the Koala moves on its own volition)
- appropriate habitat links are maintained within the clearing site and between the site and its adjacent areas, to allow Koalas living on the site to move out of the site.

Vegetation management

To avoid unintentional impacts to vegetation identified retention, EP010 of the CEMP (Duke Environmental 2016b) specifies that during vegetation clearing the following measures shall be implemented.

- Compaction around tree bases by heavy machinery is to be avoided where practicable. Vehicles should not drive or park under tree drip-lines.
- Stockpiling should not occur under drip-lines. Should work need to be undertaken under the drip-line, time / traffic should be limited, and a mulch layer (10 cm depth) or a sufficient soil buffer should be used.
- Temporary protective measures, such as distinctive safety fencing around root zones of large trees will be used where necessary and practicable.
- It is intended that vegetation removed from the site for development purposes will be:
    - chipped and used as mulch in the vegetation/rehabilitation/weed control program. Burning is not an acceptable disposal method.
    - all native vegetation with a diameter less than 400 mm should be chipped and reused on site as mulch.
    - all imported fill material is to be clean and free of vegetative matter.
- The Contractor shall provide fences and/or trunk girdles to prevent unintended physical damage to the root system, trunk or canopy of native vegetation identified for retention.
- If vegetation is to be mulched, the Contractor shall separate native and non-native species into different stockpiles as far as is practicable. The Contractor shall remove cleared non-native vegetation from site for disposal at a suitable facility. Non-native vegetation shall not be mulched for re-use on site, to minimise the risk of propagation.

In addition to the above it is recommended that all areas of retained vegetation, including coastal wetlands, are clearly demarcated as no-go zones on construction plans and in the field, within which the following activities are prohibited:

- storage and mixing of materials
- vehicle parking
- liquid disposal

- machinery repairs and/or refuelling
- construction of property office or shed
- combustion of any material
- stockpiling of soil, rubble or debris
- unauthorised pesticide, herbicide and other chemical applications.

Weed control

Introduced flora species within the construction footprint have the potential to enter and degrade areas of retained habitat within and adjacent to the project site. EP010 and EP014 of the CEMP (Duke Environmental 2016b) specifies that during construction, the following measures shall be implemented to minimise the spread of weeds.

- All construction machinery and vehicles shall be washed down before entering the site in order to remove soil that may contain weed seeds, soil pathogens, and other pest species.
- All identified weed species shall be removed by the contractor where practicable. Weeds shall not be mulched.
- Identify existing weed distribution and abundance on the site, and design a staged weed control program that forms part of the ongoing management of the site, as habitat for native flora and fauna. These areas will be maintained and will be subject to ongoing weed control and restoration measures.
- Regularly inspect for, and control, weed species so that they do not infest gardens, flora and fauna corridors, buffer areas and remnant areas of the site.
- Compliance with the requirements of relevant Local Authority Local Laws, Policies and Guidelines on Vegetation/Weed Management.
- All weed management strategies will follow the guidelines specified in Environmental Procedure EP014.
- The application of mulch, free from contamination by weed species, to all areas of soil that have been cleared as part of the proposed works, and that are to be subsequently planted with trees and shrubs.
- Treatment of existing infestations of invasive non-native species using appropriate, species specific means including non-residual herbicides, physical removal of the whole plant, hand pulling of seedlings and cut-stump applications of residual herbicides for woody weeds.
- Removal of weed infested vegetation and weed stockpiles from all clearance areas. Stockpiled weed infested vegetation shall not be mulched for re-use on site, nor disposed of at a green waste recycling facility due to the fact that such practices facilitate the reestablishment and/or spread of weed

species. Of particular note in this respect is the prevalence of weeds such as Madeira vine, which are capable of propagation from fragments of stem or leaves.

- Appropriate disposal methods include disposal at an appropriate landfill facility, pit burning, or other disposal approved of by Council.
- The prompt and progressive rehabilitation of areas within which infestations of weed species have been treated. Early rehabilitation is required to minimise the risk of subsequent re-establishment of weeds. Such rehabilitation shall involve the planting of native trees, shrubs and under-storey species with the emphasis on species that are local to the area and which are components of ecosystem types that originally occurred in the area.
- All construction plant shall be cleaned prior to transportation onto the site, to prevent the introduction of exotic species to the site.
- Where grass seeding is to occur, the grass seed is not to be of exotic species.

Vehicle strike

The increase in traffic within the project site during the construction phase has the potential to increase the risk of vehicle strike and fauna injury/mortality. To reduce the risk of vehicle strike occurring it is recommended that a 20 km/hr speed limit it applied across the construction site, particularly along the access road into the Stage 2 footprint, where there is a higher likelihood of Koalas dispersing into/out of woodland vegetation to the north of the project site. Signage indicating the presence of Koalas should also be installed in this area.

5.2.2 Measures to manage indirect impacts during operation of the sports complex

Indirect impacts to MNES associated with Stage 2 of the GSC will primarily be associated with degradation of retained habitats through stormwater quantity and quality, lighting, noise, waste and domestic pets. Additionally, there may be an elevated risk of vehicle strike for the Koala, particularly where the access road to Stage 2 of the GSC traverses Koala habitat in the northern portion of the site.

The following measures will be implemented to minimise indirect impacts to MNES during the operational phase of the project.

Stormwater management

Water sensitive urban design principles will be adopted and appropriate stormwater management devices (e.g. vegetated swales) will be included in the detailed design of Stage 2. The Master Plan (Appendix A) indicates that swales will generally be incorporated in the car park and other hardstand areas to convey stormwater and provide bio-filtration services. Further the sporting fields themselves will act as a bio-filtration devices.

More detailed assessments of stormwater quantity and quality impacts will be undertaken as the project progresses through the detailed design phase. In addition, a formal stormwater management plan will be prepared in support of development applications at the State and Local Government levels. In order to gain relevant approvals, the management plan will be demonstrating that Stage 2 of the GSC will have a non-worsening effect on stormwater quantity, quality and downstream flood levels.

There is the potential for stormwater to transport chemicals such as insecticides and herbicides into the receiving environment. Council already undertakes aerial control programs for mosquito management in the Griffin area. Two larvicides are commonly used in this program because they have minimum impact on other organisms in the environment. There is no intention for additional mosquito control to be carried out across the GSC. Herbicide use within the environmental reserve system will be subject to standard industry practice regarding the use of aquatic ecosystem friendly herbicides, application rates and timing of herbicide use (i.e. when rain is not expected).

Therefore, it is anticipated that there will be no significant impacts to retained habitats as a result of stormwater quality and quantity.

Light pollution

It is intended for Stage 2 of the GSC to be used for night time activities that will require adequate lighting. Artificial lighting has the potential to alter the quality and useability of retained habitats through (Rich & Longcore 2006):

- interrupting of animal behaviour (e.g. attraction or avoidance to the light)
- exposure to increased levels of predation risks of nocturnal native species
- increased disorientation, potentially resulting in harm and or death associated with impact with structures
- alteration in location and availability of insects as food resources (i.e. lights attract insects.

Generally the species most likely to be impacted by artificial lights are mammals and migrating birds. Of most concern are the nocturnal mammal species which forage and move about mostly during the night, which is generally devoid of bright or focused light sources, especially sources low to the ground. Species which rely on concealment to reduce predation risk during nocturnal foraging can be severely affected by artificial lighting (Rich & Longcore, 2006). Night-length can be very important for birds, as it can determine the onset of the breeding season and migration (Lofts & Merton, 1968; Farner, 1964).

Impacts of light pollution on migratory bird species will be minimised in the first instance through the 50 m to 140 m buffer between Stage 2 of the GSC and retained coastal wetlands. In addition LED lighting will be used and lights will be directed towards ground-level. Further measures will be adopted in line with Council's 'Technical Specifications for Wildlife Sensitive Lighting' as required. These measures will act in tandem to further reduce light spill into retained coastal

habitats. It is noted that Milton and Denning (2009) did not identify any migratory bird roost sites within or directly adjacent to the site, with the closest known roost site being located 2 km to the south-west of the project site. It is considered unlikely that light pollution will degrade coastal wetland habitats to the extent that shorebirds will be deterred from using these habitats.

Light pollution is also anticipated to have minimal impact to Koala, Grey-headed Flying-fox and Water Mouse. While there may be some light spill into retained Koala and Grey-headed Flying-fox habitat within the site, these species are known to use modified urban environments and are less likely to be deterred by the levels of light generated by Stage 2 of the GSC. It is also noted that night time sports activities will not take place for the entire night and there will not be any permanent sources of light. Therefore highly mobile species such as the Grey-headed Flying-fox may use habitat within the site during periods when there are no sources of light pollution. Similar to migratory birds, impacts to Water Mouse habitat will also be reduced as a result of the buffer between the operational areas of the project and retained wetland habitats.

It is therefore anticipated that light pollution impacts will be minimal during the operational phase of the project.

Noise

The operational phase of the project will involve an increase in human activity and noise associated with sporting activities (i.e. referee whistles, sirens etc), spectators and vehicles. Most fauna species exhibit a high degree of adaptability to the noise from vehicles. Noise from sporting activities may cause some behavioural modification by birds, potentially altering feeding activity, and sudden loud noises may also startle bird and mammal species. Consequently, depending on the magnitude of noise particularly from whistles and sirens, there may be some species that would be affected by noise and therefore, would forego utilisation of habitat within the noise disturbance zones. The size of the zone would likely be different for individual species and depend on the intensity and nature of the noise sources. It is anticipated noise impacts to fauna are likely to reduce as the distance from the noise source increases. In the case of noise associated with activities that are of shorter duration, native fauna are likely to return to affected habitat areas within a short period of time once the noise emissions cease.

It is anticipated that noise impacts to shorebirds will be reduced in the first instance by the setback between the sporting fields and retained coastal wetland habitat. It is also likely that shorebirds only use coastal habitats within the site during broader movements throughout the locality, thereby reducing the potential significance of noise impacts (i.e. in comparison to potential impacts on an important roost site).

Waste

Waste generation is likely to increases as levels of human activity increase within Stage 2 of the GSC. Waste will be managed by Council through measures such as:

- the provision of an adequate number of general waste and recycling bins
- location of waste receptacles in designated areas suitable for collection by waste disposal vehicles
- regular collection of waste and recycling bins
- educational signage relating to appropriate waste and recycling disposal and impacts of waste on retained habitats.

Domestic pets

Domestic pets, particularly dogs present a threat to migratory birds and ground-dwelling fauna. Dog attack has been identified as a major threat to Koalas in the Moreton Bay Region (Hanger et al., 2017). Predation and disturbance by dogs is also recognised as a threat to migratory shorebirds (DoEE, 2017a) and Water Mouse (DoEE, 2019ah). Provision of an off-leash dog area was considered to as part of the Master Plan for the GSC, but has not been included for practical and management purposes. It is intended for Stage 2 of the GSC to be managed as a dog on-leash zone. Dogs will be prohibited from retained areas of habitat, particularly coastal wetland habitat and educational signage used to explain the impacts dogs can have on shorebirds.

Vehicle strike

The increase in traffic within the project site during the operational phase also has the potential to increase the risk of vehicle strike and fauna injury/mortality. To reduce the risk of vehicle strike occurring it is recommended that a 20-40 km/hr speed limit be applied to all roads within the Stage 2 footprint. During the detailed design phase, speed management measures such as calming devices, speed alert devices, wildlife road stencilling and signage should be incorporated into access road design.

Ecosystem rehabilitation

The approved Master Plan provides for the retention, protection and enhancement of native vegetation that is external to the Stage 1 and 2 sporting precincts. This also includes the establishment of the Griffin Environmental Reserve in the southern portion of the Master Plan area. It is important to note that there will be no reduction in the areas identified in the Master Plan for environmental and vegetation protection zones. Revegetation has already been completed as part of Stage 1 of the sports complex.

In relation to the proposed Stage 2, it is proposed to undertake revegetation works within the 9.6 ha area between the mosquito buffer and the mapped level of the highest astronomical tide (Figure 8). Further detail of the proposed revegetation is provided in Appendix G. This work will involve the planting of approximately 3,000 Koala habitat trees (primarily Queensland Blue Gum with some Grey Ironbark and Broad-leaved Paperbark replicating) to increase the habitat quality of the existing trees within portions of this buffer and increase habitat connectivity. Of particular importance would be increasing the density of Koalas habitat trees

and canopy overlap, thus reducing the frequency and/or time that dispersing individuals spend on the ground moving between trees.

To ensure impacts to retained habitats are minimised as far as practical it is recommended that the rehabilitation plan includes measures around:

- the use of herbicide-free weed control measures in the first instance (e.g. use of mulch and/or hand removal of weeds where practical)
- recommended herbicides for use around wetland environments
- application of herbicides in manner that reduce impacts to surrounding environment.

Coastal wetland habitat within the project site are in good condition, with low levels of weed infiltration and other forms of degradation such as pollution and litter. Active rehabilitation works in these areas is likely to be limited to targeted weed control within fringing communities and monitoring of ecosystem health.

5.3 Significance of impacts

Offsets are required under the EPBC Act if an action is likely to give rise to a significant residual impact on MNES. The EPBC Act Environmental Offsets Policy (SEWPaC 2012) details requirements under the EPBC Act in relation to biodiversity offsets. The Significant Impact Guidelines 1.1: Matters of National Environmental Significance (DotE 2013) provides guidance to assist with determining whether an impact is considered significant.

The following sections outline the potential significant residual impacts to MNES either recorded or considered to have a moderate to high likelihood of occurrence in the study area.

5.3.1 Impacts to EPBC Act listed communities

Two TECs listed under the EPBC Act have been identified within the project site namely:

- Swamp Oak TEC - endangered
- Coastal saltmarsh TEC – vulnerable.

Threats to the recovery of these TECs that are relevant the project include:

- clearing and fragmentation
- weeds
- waste and pollution
- changes to hydrology, including from flood mitigation and drainage works
- acid sulfate soils
- impacts resulting from recreational activity
- Climate change, particularly sea-level rise.

Approximately 0.1 ha of Swamp Oak TEC extends into the project site from a larger polygon of this community to the east that encompasses 0.6 ha. Stage 2 of the GSC has specifically designed to avoid direct impacts to impacts to this TEC. Further, this community will be retained and protected as part of the environmental protection zone across the broader Master Plan for the GSC. An assessment against the EPBC Act significant impact guidelines for endangered ecological communities is provided in Table 3 below.

Table 3: Assessment against significant impact criteria for the endangered Swamp Oak TEC

Significance criteria	**Assessment of significance**
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	Stage 2 of the GSC will not result in the reduction of the extent of Swamp Oak TEC within or adjacent to the project site. Specifically, Swamp Oak TEC within the project site will be retained and protected as part of the broader GSC environmental reserve system (refer Appendix A).
Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	Swamp Oak TEC within the project site will be retained and protected as part of the broader GSC environmental reserve system (refer Appendix A). Therefore this will community will not fragmented as a result of Stage 2 of the GSC.
Adversely affect habitat critical to the survival of an ecological community	Swamp Oak TEC within the project site is unlikely to be critical to the survival of the community given its small size. Nonetheless, there will be no direct impacts to this community and management measures are proposed to reduce the risk of indirect impacts such as erosion and sedimentation, stormwater quality, waste and weeds degrading retained Swamp Oak TEC.
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 drainage patterns	A number of controls will be put in place to minimise indirect impacts such as erosion and sedimentation, water quality and waste/pollution (refer Sections 4.3.2 and 4.3.3). Therefore, Stage 2 of the GSC is unlikely to modify or destroy abiotic factors necessary for survival of the Swamp Oak TEC.
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 of flora or fauna harvesting	Given direct impacts to Swamp Oak TEC in the project site have been avoided, the introduction of weeds would be the primary mechanism whereby project activities could give rise to a change to the species composition of the community. However, weed control measures (Section 4.3.3 and 4.3.4) will be implemented across the project site to assist in minimising the risk of degradation of this TEC through weed invasion.

Significance criteria	Assessment of significance
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, or ▪ 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, or	The project is unlikely to provide any pathways for the introduction of invasive weeds that are not already present in the project site and surrounds. It is noted that the Swamp Oak TEC within the project site is set back from the Stage 2 footprint by at least 90 m. further community is encircled by mangroves and Coastal Saltmarsh TEC, which are likely to act as a natural barrier to weed invasion to some extent. The project is unlikely to result in mobilisation of pollutants of any kind into this TEC. Appropriate stormwater quality and quantity control measures are proposed for both the construction and operational phases of the project (refer Section4.3.2 and 4.3.3).
Interfere with the recovery of an ecological community.	It is highly unlikely that Stage 2 of the GSC will interfere with recovery of the Swamp Oak TEC given: ▪ the relatively small size of the polygon of TEC present within and adjacent to the project site ▪ there will be no direct impacts to the Swamp Oak TEC within and adjacent to the project site ▪ Swamp Oak TEC within the project site will be retained and protected as part of the GSC environmental reserve system ▪ Indirect impacts such as erosion and sedimentation, stormwater quality, waste and weed invasion will be managed throughout the construction and operational phases of the project.
Conclusion: Stage 2 of the GSC is unlikely to have a significant impact on Swamp Oak TEC as the project avoids direct impacts to this community, appropriate buffers have been included between the sports precinct and Swamp Oak TEC and indirect impacts will be managed appropriately.	

Approximately 5.9 ha of Coastal Saltmarsh TEC has been identified within the project site. It is noted that TECs that are listed as vulnerable, such as the Coastal Saltmarsh TEC, are not MNES for the purposes of Part 3 of the EPBC Act which relates to the requirements for environmental approvals. Nonetheless, following the same rationale outlaid in Table 3 above, Stage 2 of the GSC is unlikely to have a significant impact on Coastal Saltmarsh TEC primarily because:

- there will be minimal (0.01 ha) direct impacts to this community with impacts limited to a small disjunct patch of the community, with the vast

majority of Coastal Saltmarsh TEC being retained and protected in the GSC environmental reserve system

- the impacts relate to the proposed mosquito buffer, detailed design of the buffer may enable this impact to be avoided
- adequate buffers (i.e. at least 50 m) between the Stage 2 footprint and great majority of the Coastal Saltmarsh TEC have been provided in the layout for Stage 2
- indirect impacts as such as erosion and sedimentation, stormwater quality and weed invasion will be managed during both the construction and operational phases of the development
- there will no disruption or alteration of the local tidal regime.

5.3.2 Impacts to EPBC Act listed flora species

No EPBC Act listed flora species were recorded within the project site during the field surveys (Duke Environmental, 2016b; Ecological Survey & Management, 2019). Further, no threatened flora species returned from database searches are expected to occur within of adjacent the project site given the lack of suitable habitat and/or records in the search area (Appendix C).

5.3.3 Impacts to EPBC Act listed fauna species

A Koala was recorded in the north-west portion of the project site. The species has also been recorded using the project site (Hanger et al. 2017; B. Nottidge pers. comm. 2019) and there are numerous records for the Koala within 5 km of the project site.

In addition, a number of other EPBC Act listed species are considered to have a moderate or high likelihood of occurrence in the project site, namely:

- eight species of threatened migratory shorebirds
- Grey-headed Flying-fox
- White-throated Needletail
- Water Mouse.

The significance of impacts on EPBC Act listed fauna species that were either recorded or considered to have a moderate or high likelihood of occurrence in the project site are addressed in detail below. Based on these significance assessments, offsets are not required for impacts to EPBC Act listed threatened fauna species, given it is anticipated that Stage 2 of the GSC will not have a significant residual impact on these species owing to:

- avoidance of direct impacts to coastal wetland habitats
- minimisation of direct impacts to terrestrial habitats
- compensatory planting of Koala habitat tree tube stock (i.e. comprising Queensland Blue Gum, Northern Grey Ironbark and Broad-leaved

Paperbark) at 8 m spacings, which equates to approximately 3,000 plantings, within the buffer area between the mosquito buffer and the HAT level (Figure 8 and Appendix G)

- appropriate management of indirect habitats
- the extensive environmental reserve system that has been included in the Master Plan for the GSC.

Koala

A Koala was recorded from the north-west portion of the project site in July 2022 and potential Koala scats and scratch marks were recorded during the detailed survey of Koala habitat trees within the Stage 2 footprint completed in October 2019. Further data from Koala monitoring in the Griffin area indicates that Koalas are moving through Lot 2 on RP85288 and the project site to gain access to more intact woodland vegetation in the unformed portion of Elizabeth Road and adjoining properties to the north (Hanger et al. 2017; B. Nottidge pers. comm. 2019).

A total of 148 mature Koala habitat trees were mapped on the project site within the vicinity of the proposed sports centre. Additional mature Koala habitat trees are located on the project site that were not mapped as they are outside of the proposed disturbance area (Figure 6). In addition, 189 regrowth Koala habitat trees with a maximum diameter at breast height (DBH) of 15 cm were identified in four areas within the proposed disturbance area (Figure 6). Stage 2 of the GSC would result in the removal of 134 mature Koala habitat trees and the 189 regrowth Koala habitat trees (Figure 7).

Koala habitat within the Stage 2 footprint consists of historically cleared paddock with relic mature and regenerating Queensland Blue Gum (Appendix E). This species along with Northern Grey Ironbark that occurs within the project site, are considered to be locally important Koala habitat trees according to the ANU study. A number of other trees within the project site are considered to have ancillary habitat value according to the ANU review (Youngentob et al., 2021).

The location and extent of non-juvenile Koala habitat trees[1] within the Stage 2 footprint is illustrated in Figure 7 and details for these trees is provided in Appendix F. It is noted that a number of the mature Queensland Blue Gum within the Stage 2 footprint were found to have poor canopy health (Appendix F).

Although this impact potentially involves habitat critical to the survival of the Koala, this is unlikely to interfere with the recovery of the Koala because:

- direct impacts to Koala habitat have been minimised as far as practical
- the pattern of Koala habitat removal will not result in fragmentation of habitat

[1] As defined by the Queensland Government Non-juvenile koala habitat tree means a koala habitat tree that is more than 4 high or has a trunk with a circumference of more than 31.5cm at 1.3m above the ground.

- Koala habitat outside of the Stage 2 footprint will be retained, protected and enhanced as part of the GSC environmental reserve system, which will improve connectivity of habitat and dispersal opportunities and lower predatory risks for Koala moving through the project site
- rehabilitation of retained habitat within the project site, Lot 2 on RP85288 and broader GSC Master Plan will provide a net benefit to the local Koala population through:
    - increasing the availability of Koala habitat trees in the project site, GSC Master Plan area and broader Griffin locality, by planting approximately 3,000 locally important Koala habitat trees within the project site
    - improving the values of the corridor currently being used by Koalas by reducing the need and/or time for Koalas to travel along the ground as they move between habitat trees.

Given the above, the ecological benefits of the environmental reserve system that forms a critical component of the GSC Master Plan outweigh the impacts associated with the loss of Koala habitat within the Stage 2 footprint.

An assessment against the significant impact for the endangered Koala is provided in Table 4 below.

Table 4: Assessment against significant impact criteria for the endangered Koala

Significant impact criteria	Assessment
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:	
Lead to a long-term decrease in the size of a population	It is considered unlikely that Stage 2 of the GSC will lead to the long-term decrease of a population of the Koala given: ▪ direct impacts to Koala habitat have been minimised as far as practical, with the removal of 134 mature Koala habitat trees and the 189 regrowth Koala habitat trees ▪ the pattern of Koala habitat removal will not result in fragmentation of habitat ▪ the value of Koala habitat in the Stage 2 footprint has been reduced by historic clearing and current levels of poor canopy health ▪ Approximately 9.6 ha within the project site will be retained, protected and planted with approximately 3,000 Koala habitat trees as part of the GSC environmental reserve system, which will result in a net benefit to the Griffin Koala population through increasing the quality and quantity of Koala habitat trees available in the locality. This results in a compensatory planting ratio of approximately nine trees planted for every one removed. ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts (e.g. dust, light pollution, vehicle strike) to habitat for this species (refer Sections 4.3.2 and 4.3.3) ▪ appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct)
▪ Reduce the area of occupancy of the species	It is unlikely that Stage 2 of the GSC will reduce the area of occupancy of a population of the Koala given that approximately 9.6 ha within the project site will be retained, protected and planted with approximately 3,000 Koala habitat trees, compared with the removal of 134 mature Koala habitat trees and 189 regrowth Koala habitat trees.
▪ Fragment an existing population into two or more populations	The pattern of clearing of Koala habitat to establish Stage 2 of the GSC will not fragment the existing Koala population into two populations. Movement opportunities for Koala will be maintained and enhanced through the retention and protection of habitat within the project site and broader GSC environmental reserve system, including through additional tube stock plantings of approximately 3,000 locally important Koala habitat trees.

Significant impact criteria	Assessment
▪ Adversely affect habitat critical to the survival of a species	Potential habitat critical to the survival of the species is proposed to be removed. However, the following measures will be put in place to minimise impacts and improve habitat quality overall within the project site. Measures include: ▪ Employing appropriate management measures during the construction and operational phases of the project to minimise the risk of indirect impacts (e.g. dust, light pollution, vehicle strike) to habitat for this species (refer Sections 4.3.2 and 4.3.3) ▪ restriction and management of domestic dogs on site (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct) ▪ retention, protection and enhancement of Koala habitat within the GSC environmental reserve system in the GSC master Plan, through compensatory plantings of approximately 3,000 locally important Koala habitat trees, which will have a net benefit on the Griffin Koala population through increasing the quality and quantity of Koala habitat available in the locality.
▪ Disrupt the breeding cycle of a population	The proposed removal of 134 mature Koala habitat trees and 189 regrowth Koala habitat trees is unlikely to disrupt the breeding cycle of the local population. This is because it is a relatively small number of trees and higher quality habitat is located to the north of the project site. Standard industry recognised measures will be employed during the vegetation clearing stages of the project to minimise harm and disruption to animals and breeding places in accordance with the requirements of the Queensland *Nature Conservation Act 1992*.
▪ Modify, destroy, remove,isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The following measures will be undertaken to minimise impacts to the availability or quality of habitat in the project site: ▪ Approximately 9.6 ha within the project site will be retained, protected and planted with approximately 3,000 Koala habitat trees, resulting in a net benefit to the Griffin Koala population ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts (e.g. dust, light pollution, vehicle strike) to habitat for this species (refer Sections 4.3.2 and 4.3.3) ▪ restriction and management of domestic dogs will take place on site (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct). Overall, the quantity and quality of Koala habitat within the project site will be enhanced, reducing the risk that the species is likely to decline as a result of the project.

Significant impact criteria	Assessment
▪ Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	There are no invasive plant species that are specifically recognised as a threat to the Koala. Nonetheless, the CEMP provide measures to reduce the spread of weeds during the construction of Stage 2 of the GSC. Weed populations in retained areas of habitat will managed as part of the rehabilitation program (Section 4.3.4). Predation and attack by domestic dogs is a recognised threat to the Griffin Koala population (Hanger et al., 2017). Given the proximity to existing residential development, domestic pets are currently likely to occur within the project site. It is intended that once operational the GSC will be managed as: ▪ dogs prohibited from areas outside of the Stage 2 footprint ▪ dogs on-leash within the Stage 2 precinct (i.e. sports fields, tennis courts, club houses etc). Substantial revegetation via tube stock planting of approximately 3,000 locally important Koala habitat trees, throughout the GSC environmental reserve system, will also reduce the risk of dog attack to the local Koala population by reducing the need for Koalas to move along the ground between habitat tress.
▪ Introduce disease that may cause the species to decline, or	Three viruses are known to affect Koalas in the wild, Chlamydia and Koala Retrovirus (KoRV-A and KoRV-B). It is known that Chlamydia is a sexually transmitted disease in Koalas, however, how the Retrovirus is spread is unknown. Studies have shown that 100% of Koalas in the wild have the Retrovirus, and the majority of Queensland and New South Wales populations are infected with Chlamydia (Hanger & Loader, 2009). Stress has been suggested to exacerbate the effects of disease on Koala populations in more populated areas. However, clearing associated with Stage 2 of the GSC is not considered to introduce or increase the prevalence of these diseases in the local Koala population. This is because of the net benefit to the local Koala population that will be achieved through the retention, protection and enhancement of Koala habitat and movement opportunities in the GSC environmental reserve system.

Significant impact criteria	Assessment
▪ Interfere with the recovery of the species.	It is unlikely that Stage 2 of the GSC will interfere substantially with the recovery of the Koala given: ▪ direct impacts to Koala habitat have been minimised as far as practical ▪ the pattern of Koala habitat removal will not result in fragmentation of habitat ▪ Approximately 9.6 ha within the project site will be retained, protected and planted with approximately 3,000 Koala habitat trees as part of the GSC environmental reserve system ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts (e.g. dust, light pollution, vehicle strike) to habitat for this species (refer Sections 4.3.2 and 4.3.3) ▪ there will be appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct) ▪ the environmental reserve system include the GSC master Plan will have a net benefit on the Griffin Koala population through increasing the quality and quantity of Koala habitat available in the locality, via tube stock planting of approximately 3,000 locally important Koala habitat trees. Based on the proposed removal of 134 mature Koala habitat trees and 189 regrowth Koala habitat trees. This equates to a compensatory planting ratio of approximately nine trees planted for every tree removed.
Conclusion: Stage 2 of the GSC is considered unlikely to cause a significant impact to the Koala given: ▪ direct impacts to Koala habitat have been minimised as far as practical, with the removal of 134 mature Koala habitat trees and 189 regrowth Koala habitat trees ▪ the pattern of Koala habitat removal will not result in fragmentation of habitat ▪ the value of Koala habitat in the Stage 2 footprint has been reduced by historic clearing and current levels of poor canopy health ▪ Koala habitat outside of the Stage 2 footprint will be retained, protected and enhanced as part of the GSC environmental reserve system ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts (e.g. dust, light pollution, vehicle strike) to habitat for this species (refer Sections 4.3.2 and 4.3.3) ▪ there will be appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct) ▪ rehabilitation of retained habitat within the project site, Lot 2 on RP85288 and broader GSC Master Plan area will provide a net benefit to the Koala through: - increasing the availability of Koala habitat trees in the project site, GSC Master Plan area and broader Griffin locality, via compensatory planting of approximately 3,000 Koala habitat trees - improving the values of the corridor currently being used by Koalas and reducing the frequency and/or time that dispersing Koalas need to spend on the ground moving between habitat trees.	

Threatened migratory shorebirds

The following seven species of shorebirds listed as threatened under the EPBC Act are highly likely to use coastal wetlands within the project site:

Critically endangered species

- Curlew Sandpiper
- Eastern Curlew
- Great Knot

Endangered species

- Lesser Sand Plover
- Red Knot

Vulnerable species

- Greater Sand Plover
- Western Alaskan Bar-tailed Godwit.

All of the above species are likely to forage in coastal wetlands within the project site. However, Curlew Sandpiper, Eastern Curlew, Godwit, Greater Sand Plover and Western Alaskan Bar-tailed Godwit are known to occasionally roost in saltmarsh communities such as those that occur in the project site. Similarly, Curlew Sandpiper, Eastern Curlew and Lesser Sand Plover are also known to roost in mangroves from time-to-time.

The Moreton Bay Regional Council Shorebird Habitat Mapping Project (Milton & Denning, 2009) did not identify any significant roost sites within or adjacent to the project site. The nearest significant roost site is a clay pan located approximately 2 km to the south-west of the project site. Coastal wetlands adjoining the eastern boundary of the project site were also identified by the Shorebird Mapping Project as potential shorebird roosting habitat.

Loss of habitat is recognised as the key threat to migratory shorebirds in Australia (DotE, 2015a). In addition degradation of habitat (e.g. pollution, litter, acid sulfate soils), increased disturbance (e.g. noise, light pollution, domestic pets) and direct mortality of birds (e.g. collision with structures, predation by domestic and feral animals) leading to a substantial reduction in shorebird numbers are also key threatening processes.

Stage 2 of the GSC has been specifically designed to avoid direct impacts to coastal wetlands within the project site that provide habitat for threatened migratory bird species. In addition, the Stage 2 footprint has been setback between 50 m and 140 m from retained coastal wetland habitats (excluding overflow parking area, which will not involve placement of fill and only be used periodically). It is unlikely that the project site itself supports important habitat (as defined by DotE (2015)) for shorebirds. However, the project site is within close proximity to the Moreton Bay Ramsar wetland that is recognised as an important site for shorebirds. In addition, the potential exists for shorebirds to use

the site during broader migratory movements. An assessment against the EPBC Act significant impact guidelines for critically endangered and endangered species is provided in Table 5 below.

Table 5: Assessment against significant impact criteria for the critically endangered and endangered migratory shorebirds

Significant impact criteria	Assessment
An action is likely to have a significant impact on a critically endangered and endangered species if there is a real chance of possibility that it will:	
▪ Lead to a long-term decrease in the size of a population	Stage 2 of the GSC is unlikely to lead to a decrease in the size of the population of critically endangered and endangered migratory shorebirds given: ▪ there will be no direct impacts to coastal wetlands that provide habitat for these species ▪ Stage 2 of the GSC will be setback between 50 m and 140 m from retained coastal wetland habitat ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts (e.g. erosion and sedimentation, stormwater quality, acid sulfate soils, light pollution and noise etc) to habitat for this species (refer Sections 4.3.2 and 4.3.3) ▪ disturbance resulting from increased human activity associated with Stage 2 of the GSC will be reduced in the first instance by a minimum 50 m setback to retained coastal wetland habitat ▪ appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct).
▪ Reduce the area of occupancy of a species	Stage 2 of the GSC is unlikely to reduce the area of occupancy critically endangered and endangered migratory shorebirds. This assessment is based on the: ▪ avoidance of direct impacts to coastal wetland habitats within the project site ▪ provision of adequate buffers (i.e. between 50 m and 140 m) between Stage 2 of the GSC and retained coastal wetland habitats ▪ appropriate management of indirect impacts e.g. erosion and sedimentation, stormwater quality, acid sulfate soils, noise, light pollution etc) throughout the construction and operational phases of the project (Sections 4.3.2 and 4.3.3) ▪ appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct).
▪ Fragment an existing population into two or more populations	Stage 2 of the GSC does not involve any clearing or modification of coastal wetlands within the project site that provide habitat for critically endangered and endangered migratory shorebirds. Moreover, all areas of coastal wetland habitat within the project site and broader GSC Master Plan (refer Appendix A) will be retained and protected as part of the environmental reserve system. Therefore the project will not result in the fragmentation of any populations of highly mobile shorebird species into two or more populations.

Significant impact criteria	Assessment
▪ Adversely affect habitat critical to the survival of a species	Stage 2 of the GSC is unlikely to adversely affect habitat for critically endangered and endangered migratory shorebirds. This assessment is based on the: ▪ avoidance of direct impacts to coastal wetland habitats within the project site ▪ provision of adequate buffers (between 50 m and 140 m) between Stage 2 of the GSC and retained coastal wetland habitats ▪ appropriate management of indirect impacts e.g. erosion and sedimentation, stormwater quality, acid sulfate soils, noise, light pollution etc) throughout the construction and operational phases of the project (Sections 4.3.2 and 4.3.3) ▪ appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct).
▪ Disrupt the breeding cycle of a population	None of the critically endangered and endangered migratory shorebirds that are likely to occur within the project site breed in Australia. Stage 2 of the GSC is unlikely to indirectly interrupt the breeding cycle of these species through influencing the number of birds in the population prior to returning to breeding grounds in the northern hemisphere given that: ▪ there will be no direct impacts to coastal wetlands that provide habitat for these species ▪ disturbance resulting from increased human activity at Stage 2 of the GSC will be reduced instance by the 50 m and 140 m setback to coastal wetland habitat ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts (e.g. erosion and sedimentation, stormwater quality, acid sulfate soils, light pollution and noise etc) to habitat for this species (refer Sections 4.3.2 and 4.3.3) ▪ appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct).
▪ Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Stage 2 of the GSC is unlikely to modify, destroy, isolate or decrease the availability or quality of habitat within project site and broader the Moreton Bay Ramsar Wetland given: ▪ there will be no direct impacts to coastal wetlands that provide potential breeding habitat for this species ▪ Stage 2 of the GSC will be setback between 50 m and 140 m from retained coastal wetland habitat ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts e.g. erosion and sedimentation, stormwater quality, acid

Significant impact criteria	Assessment
	sulfate soils, light pollution etc) to habitat for this species (refer Sections 4.3.2 and 4.3.3) ▪ appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct) ▪ coastal wetlands to the west and south of the project will also be retained and protected as part of the environmental reserve system included in the broader GSC Master Plan (Appendix A).
▪ Result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat	Disturbance and predation by domestic dogs is a recognised threat to critically endangered and endangered migratory shorebirds. Given the proximity to existing residential development, domestic pets are currently likely to occur within the project site. It is intended that once operational the GSC will be managed as: ▪ dogs prohibited from areas outside of the Stage 2 footprint ▪ dogs on-leash within the Stage 2 precinct (i.e. sports fields, tennis courts, club houses etc). It is unlikely that Stage 2 of the GSC will result in the introduction or substantial increase of other feral predators such as European Red Fox.
▪ Introduce disease that may cause the species to decline, or	There are no known pathogens or disease that may cause populations of critically endangered and endangered migratory bird species to decline. It is unlikely that the activities associated with Stage 2 of the GSC will result in the introduction of a disease that could result in the decline of shorebird populations.
▪ Interfere substantially with the recovery of the species.	Stage 2 of the GSC is unlikely to substantially interfere with the recovery of the populations of critically endangered and endangered migratory birds given: ▪ there will be no direct impacts to coastal wetlands that provide potential breeding habitat for this species ▪ Stage 2 of the GSC will be setback between 50 m and 140 m from retained coastal wetland habitat ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts e.g. erosion and sedimentation, stormwater quality, acid sulfate soils, light pollution etc) to habitat for this species (refer Sections 4.3.2 and 4.3.3) ▪ appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct) ▪ coastal wetlands to the west and south of the project will also be retained and protected as part of the broader GSC Master Plan (Appendix A).
Conclusion: Stage 2 of the GSC is unlikely to have significant impact on critically endangered and endangered migratory birds given: ▪ there will be no direct impacts to coastal wetland habitats within the project site ▪ adequate buffers (i.e. 50 m and 140 m) between Stage 2 of the GSC and retained coastal wetland habitats have been provided in the layout	

Significant impact criteria	Assessment
▪ there will be appropriate management of indirect impacts e.g. erosion and sedimentation, stormwater quality, acid sulfate soils, noise, light pollution etc) throughout the construction and operational phases of the project (Sections 4.3.2 and 4.3.3) ▪ there will be appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct).	

The significant impact criteria for the vulnerable Greater Sand Plover and Western Alaskan Bar-tailed Godwit are similar to the criteria addressed for critically endangered and endangered migratory shorebirds in Table 5 above. The key difference for vulnerable species is the concept of an 'important population' and the assessment of impacts on an 'important population'. Following the same rationale provided in Table 5, Stage 2 of the GSC is unlikely to have a significant impact on Greater Sand Plover and Western Alaskan Bar-tailed Godwit given it will not:

- lead to a long-term decrease in the size of an important population of Greater Sand Plover and Western Alaskan Bar-tailed Godwit
- reduce the area of occupancy of an important population of Greater Sand Plover and Western Alaskan Bar-tailed Godwit
- fragment an existing important population of Greater Sand Plover and Western Alaskan Bar-tailed Godwit into two or more populations
- adversely affect habitat critical to the survival of Greater Sand Plover and Western Alaskan Bar-tailed Godwit
- disrupt the breeding cycle of an important population of Greater Sand Plover and Western Alaskan Bar-tailed Godwit
- modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the Greater Sand Plover and Western Alaskan Bar-tailed Godwit are likely to decline
- result in invasive species that are harmful to Greater Sand Plover and Western Alaskan Bar-tailed Godwit becoming established in habitat for these species
- introduce disease that may cause Greater Sand Plover and Western Alaskan Bar-tailed Godwit to decline, or
- interfere substantially with the recovery of the Greater Sand Plover and Western Alaskan Bar-tailed Godwit.

Grey-headed Flying Fox

There is a high likelihood that Grey-headed Flying-fox feed on eucalypts (when in flower) within the site during broader movements throughout the locality. Duke Environmental (2016) recorded flying foxes during nocturnal surveys, but the species was not identified at the time. Nonetheless, the Redcliffe Botanic Gardens, located approximately 7 km north-east of the project site, supports a flying fox camp that is regularly used by Grey-headed Flying-fox (DoEE 2019d; Moreton Bay

Regional Council 2019). No roost sites were observed within or adjacent to the site during the site inspections. Further, there are no historic records for roosts within or adjacent to the site.

Approximately 13.4 ha of suitable forage habitat is present within the project site. Of this, approximately 8.3 ha of habitat supporting 132 scattered mature Queensland Blue Gum and 2 Broad-leaved Paperbark trees occurs within the footprint for Stage 2 of the GSC. This represents approximately 62% of habitat for this species mapped within the project site. An assessment against the EPBC Act significant impact guidelines for vulnerable species is provided in Table 6 below.

Table 6: Assessment against significant impact criteria for the vulnerable Grey-headed Flying Fox

Significant impact criteria	Assessment
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
▪ Lead to a long-term decrease in the size of an important population of a species	Stage 2 of the GSC is unlikely to lead to a decrease in the size of an important population of Grey-headed Flying-fox given: ▪ the project will only necessitate the removal of approximately 8.3 ha of forage habitat supporting scattered 132 scattered mature Queensland Blue Gum and 2 Broad-leaved Paperbark trees ▪ impacts to roost sites are highly unlikely given there are no known roost sites within or adjacent to the project site and the nearest known roost site is 7 km north-east of the project site in Redcliffe Botanic Gardens ▪ the balance of potential forage habitat for this species in the project site will be retained, protected and enhanced ▪ terrestrial vegetation on properties to the west and south of the project site will be retained, protected and enhanced as part of the GSC environmental reserve system ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts such as noise and light pollution to Grey-headed Flying-fox (refer Section 4.3.2 and 4.3.3).
▪ Reduce the area of occupancy of an important population	As discussed above, the removal of 8.3 ha of forage habitat for this species supporting 132 scattered mature Queensland Blue Gum and 2 Broad-leaved Paperbark trees is unlikely to reduce the area of occupancy of an important population of Grey-headed Flying-fox. More than adequate compensation for the loss of forage habitat within the footprint for Stage 2 of the GSC will occur through the retention, protection and enhancement of retained habitat within the project site and the broader GSC environmental reserve system.
▪ Fragment an existing important population into two or more populations	The extent and pattern of proposed habitat removal is unlikely to fragment any existing important populations of this highly mobile species into two or more populations. Areas of potential forage habitat for this species will be retained within the project site and broader GSC environmental reserve system. It is intended for habitat resources within retained

	areas to be enhanced through rehabilitation and revegetation works (Section 4.3.4).
▪ Adversely affect habitat critical to the survival of a species	There is no evidence to indicate that the project site supports habitat that is critical to the survival of the Grey-headed Flying-fox. Moreover, the Stage 2 of the GSC will impact on a relatively small area of potential forage habitat for this species, no roost sites are located within or adjacent to the project site. The proposed removal of approximately 8.3 ha of forage habitat supporting 132 scattered mature Queensland Blue Gum and 2 Broad-leaved Paperbark trees is unlikely to have an adverse impact on the survival of the Grey-headed Flying-fox. Areas of potential forage habitat for this species will be retained within the project site and broader GSC environmental reserve system. It is intended for habitat resources within retained areas to be enhanced through rehabilitation and revegetation works (Section 4.3.4).
▪ Disrupt the breeding cycle of an important population	No Grey-headed Flying-fox camps occur within or adjacent to the project site, the closest known camp is located 7 km to the north-east of the project site in the Redcliffe Botanic Gardens. This camp is far enough removed from the GSC that it is unlikely that indirect such as noise and lighting associated with the construction and operation of Stage 2 will have impact upon the camp. The proposed removal of approximately 8.3 ha of forage habitat supporting scattered mature Queensland Blue Gum is unlikely to disrupt the breeding cycle of an important population. Further, retained habitat within the project site will retained, protected and enhanced as part of the broader GSC environmental reserve system.
▪ Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Stage 2 of the GSC is unlikely to modify, destroy, isolate or decrease habitat for Grey-headed Flying-fox within the Griffin locality given: ▪ the project will only necessitate the removal of approximately 8.3 ha of forage habitat supporting 132 scattered mature Queensland Blue Gum and 2 Broad-leaved Paperbark trees ▪ impacts to a camp is highly unlikely given there are no known roost sites within or adjacent to the project site, the nearest known roost site is 7 km north-east of the project site in Redcliffe Botanic Gardens ▪ the balance of potential forage habitat for this species in the project site will be retained, protected and enhanced ▪ terrestrial vegetation on properties to the west and south of the project site will be retained, protected and enhanced as part of the GSC environmental reserve system ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts to Grey-headed Flying-fox (refer Section 4.3.2 and 4.3.3).
▪ Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Invasive plants are not recognised as key threat to Grey-headed Flying-fox. It is unlikely that Stage 2 of the GSC would result in the introduction of an invasive vine or tree species that has the potential to impact upon the retained forage habitat within the project site and broader GSC environmental reserve. Areas designated for retention, protection and

	enhancement will be actively managed as part of a rehabilitation plan until they become self-sustaining (Section 4.3.4). Similarly, predation by feral animals is not recognised as a key threatening process to Grey-headed Flying-fox survival. Given the proximity to existing residential development, domestic pets are currently likely to occur within the project site. It is intended that once operational the GSC will be managed as a dog-free or on-leash area. It is unlikely that Stage 2 of the GSC will result in the introduction of other potential feral predators such as foxes.
▪ Introduce disease that may cause the species to decline, or	There are no known pathogens or disease that may cause the Grey-headed Flying-fox to decline. It is unlikely that the activities associated with Stage 2 of the GSC will result in the introduction of a disease that could result in the decline of Grey-headed Flying Fox.
▪ Interfere substantially with the recovery of the species.	Stage 2 of the GSC will result in the removal of 8.3 ha of potential forage habitat for the Grey-headed Flying Fox. This represents approximately 62% of the habitat present in the project site. The extent of clearing is considered unlikely to interfere substantially with the recovery of the Grey-headed Flying Fox as the loss of habitat will be compensated through the retention, protection and enhancement of retained habitat within the project site and broader GSC environmental reserve system including the planting of approximately 3,000 trees.
Conclusion: Stage2 of the GSC is unlikely to cause a significant impact to the Grey-headed Flying-fox given: ▪ only a relatively small area of forage habitat is proposed to be cleared ▪ no roost sites occur within or adjacent to the project site ▪ indirect impacts will be managed and minimised during the construction and operational phases of the project ▪ retained habitat within the project site and broader GSC will protected and enhanced including the planting of approximately 3,000 trees.	

White-throated Needletail

There is a moderate likelihood that the White-throated Needletail could overfly the project site as part of wider foraging movements. This species has not been recorded during field surveys completed across the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019). However, there are 15 Wildlife Online records for this species within 5 km of the project site and it is known to forage over a range of habitats. Vegetation within the footprint for Stage 2 of the GSC is unlikely to be used for roosting given the lack of hollow-bearing trees and there is no evidence of traditional roost sites within or adjacent to the project site (DotE, 2015b; DoEE, 2019r).

The entire project site provides potential forage habitat for this species. Approximately 9.6 ha of habitat occurs within the footprint for Stage 2 of the GSC, which represents around 26% of the available potential forage habitat. An assessment against the EPBC Act significant impact guidelines for vulnerable species is provided in Table 7 below.

Table 7: Assessment against significant impact criteria for the vulnerable White-throated Needletail

Significant impact criteria	Assessment
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
▪ Lead to a long-term decrease in the size of an important population of a species	There is no evidence to suggest that the project site supports an important population of White-throated Needletail. Stage 2 of the GSC is unlikely to lead to a decrease in the size of the local population of White-throated Needletail given: ▪ the project will only necessitate the removal of approximately 9.6 ha (or 26%) of forage habitat within the project site ▪ the balance of potential forage habitat for this species in the project site will be retained, protected and enhanced ▪ the broader GSC Master Plan provides for the retention, protection and enhancement of vegetation on properties to the west and south of the project site ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts to potential forage habitat for White-throated Needletail habitat (refer Section 4.3.2 and 4.3.3).
▪ Reduce the area of occupancy of an important population	As discussed above, the removal of 9.6 ha of forage habitat for this species is unlikely to reduce the area of occupancy of the White-throated Needletail. More than adequate compensation for the loss of forage habitat within the footprint for Stage 2 of the GSC will occur through the retention, protection and enhancement of retained habitat within the project site and the broader GSC environmental reserve system (refer Appendix A).
▪ Fragment an existing important population into two or more populations	The extent and pattern of proposed habitat removal is unlikely to fragment any existing populations of this highly mobile species into two or more populations. Potential forage habitat for this species external to the Stage 2 footprint will be retained, protected and enhanced as part of broader GSC environmental reserve system. It is intended for habitat resources within retained areas to be enhanced through rehabilitation and revegetation works (Section 4.3.4).
▪ Adversely affect habitat critical to the survival of a species	There is no evidence to indicate that the project site supports habitat that is critical to the survival of the White-throated Needletail. Woodland vegetation within the project site is considered to unlikely to be used for roosting given the lack of hollow-bearing trees and there is no evidence of traditional roosting sites within or adjacent to the project site. The proposed removal of approximately 9.6 ha of potential forage habitat, is unlikely to have an adverse impact on the survival of the White-throated Needletail. Potential forage habitat for this species external to the Stage 2 footprint will be retained, protected and enhanced as part of broader GSC environmental reserve system. It is intended for habitat resources within retained areas to be enhanced through rehabilitation and revegetation works (Section 4.3.4).

Significant impact criteria	Assessment
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
▪ Disrupt the breeding cycle of an important population	White-throated Needletail does not breed in Australia. Stage 2 of the GSC is unlikely to indirectly interrupt the breeding cycle of these species through influencing the number of birds in the population that return to breeding grounds given that: ▪ the project will only necessitate the removal of approximately 9.6 ha (or 26%) of forage habitat within the project site ▪ vegetation within the footprint for Stage 2of the GSC is unlikely to be used for roosting given the lack of dense foliage and hollow-bearing limbs ▪ the balance of potential forage habitat for this species in the project site will be retained, protected and enhanced. ▪ the broader GSC Master Plan provides for the retention, protection and enhancement of vegetation on properties to the west and south of the project site ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts to potential forage habitat for White-throated Needletail (refer Section 4.3.2 and 4.3.3).
▪ Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Stage 2 of the GSC is unlikely to modify, destroy, isolate or decrease the availability or quality of habitat within the Griffin locality given: ▪ the project will only necessitate the removal of approximately 9.6 ha (or 26%) of forage habitat within the project site ▪ vegetation within the footprint for Stage 2of the GSC is unlikely to be used for roosting given the lack of dense foliage and hollow-bearing limbs ▪ the balance of potential forage habitat for this species in the project site will be retained, protected and enhanced. ▪ the broader GSC Master Plan provides for the retention, protection and enhancement of vegetation on properties to the west and south of the project site ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts to potential forage habitat for the White-throated Needletail (refer Section 4.3.2 and 4.3.3).
▪ Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Invasive species are not recognised as key threat to White-throated Needletail. It is unlikely that the activities associated with Stage 2 of the GSC will result in the introduction of an invasive species that could result in the decline of White-throated Needletail.
▪ Introduce disease that may cause the species to decline, or	There are no known pathogens or disease that may cause the White-throated Needletail to decline. It is unlikely that the activities associated with Stage 2 of the GSC will result in the introduction of a disease that could result in the decline of White-throated Needletail.

Significant impact criteria	Assessment
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
▪ Interfere substantially with the recovery of the species.	Stage 2 of the GSC will result in the removal of 9.6 ha of potential forage habitat for the White-throated Needletail. This represents approximately26% of the potential forage habitat available across the project site. The extent of clearing is considered unlikely to interfere substantially with the recovery of the White-throated Needletail as roosting habitat will not be impacted. Further, the loss of potential forage habitat will be compensated through the retention, protection and enhancement of retained habitat within the project site and broader GSC environmental reserve.
Conclusion: Stage 2 of the GSC is unlikely to cause a significant impact to the White-throated Needletail given: ▪ only a relatively small area of potential forage habitat is proposed to be cleared ▪ vegetation within the footprint for Stage of the GSC is unlikely to be used for roosting given the lack of dense foliage and hollow-bearing trees ▪ indirect impacts will be managed and minimised during the construction and operational phases of the project ▪ retained potential forage habitat within the project site and broader GSC environmental reserve system will be protected and enhanced.	

Water Mouse

Coastal wetlands supporting mangrove and saltmarsh communities within the project site have the potential to provide habitat for the Water Mouse. While there are no Wildlife Online records for this species within 5 km of the site, this species is typically associated with coastal wetland habitats similar to that in the project site and nearby adjoining Hays Inlet Conservation Park. The project site occurs within an area where habitat modelling indicates the species is 'likely to occur' (DoEE, 2019ah). It is noted that adequate surveys to confirm the presence/absence of Water Mouse within the project site have not been conducted.

The Water Mouse is one nationally important population (DotE, 2015c). Recognised threats to this nationally important population that are relevant to the project include:

- habitat loss and degradation
- fragmentation of habitat
- changes in hydrology and sedimentation from stormwater runoff
- acid sulfate exposure
- predation by native and introduced fauna
- herbicides, pesticides and oil pollution.

Stage 2 of the GSC has been specifically designed to avoid direct impacts to coastal wetland habitat for the Water Mouse within the project site. In addition,

the Stage 2 footprint has been setback at least 50 m from retained coastal wetland habitats for this species. An assessment against the EPBC Act significant impact guidelines for vulnerable species is provided in Table 8 below.

Table 8: Assessment against significant impact criteria for the vulnerable Water Mouse

Significant impact criteria	Assessment
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
▪ Lead to a long-term decrease in the size of an important population of a species	The Referral Guideline for this species (DotE, 2015c) states that the Water Mouse is one single nationally important population. Stage 2 of the GSC is unlikely to lead to a decrease in the size of the nationally important population of Water Mouse given: ▪ there will be no direct impacts to coastal wetlands that provide habitat for this species ▪ Stage 2 of the GSC will be setback between 50 and 140 m from retained coastal wetland habitat, this is in line with the minimum 50 m buffer recommended in the Referral Guideline for this species (DotE, 2015c) ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts (e.g. erosion and sedimentation, stormwater quality, acid sulfate soils, light pollution etc) to habitat for this species (refer Sections 4.3.2 and 4.3.3) ▪ appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct).
▪ Reduce the area of occupancy of an important population	Stage 2 of the GSC is unlikely to reduce the area of occupancy of the nationally important population of Water Mouse. This assessment is based on the: ▪ avoidance of direct impacts to coastal wetland habitats within the project site ▪ provision of adequate buffers (i.e. >50 m) between Stage 2 of the GSC and retained coastal wetland habitats ▪ appropriate management of indirect impacts e.g. erosion and sedimentation, stormwater quality, acid sulfate soils, light pollution etc) throughout the construction and operational phases of the project (Sections 4.3.2 and 4.3.3) ▪ appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct).
▪ Fragment an existing important population into two or more populations	Stage 2 of the GSC does not involve any clearing or modification of coastal wetland habitat for the Water Mouse within the project site. Moreover, all areas of coastal wetland habitat within the project site and broader GSC Master Plan area will be retained and protected as part of the environmental reserve system (refer Appendix A). The project will not result in the fragmentation of the nationally important population of Water Mouse into two or more populations.

▪ Adversely affect habitat critical to the survival of a species	The Referral Guideline for the Water Mouse (DotE, 2015c) states that the habitat critical to the survival of this species includes all mangrove communities, intertidal communities, and coastal freshwater wetlands with one or more of the following features: ▪ intact hydrology ▪ prey resources (Crustaceans, marine polyclads and marine pulmonates and bivalves) ▪ active Water Mouse nest structures ▪ a defined supralittoral bank that could enable the construction of nests. Coastal wetlands within and adjacent to the project site satisfy the above definition of habitat critical to the survival of the Water Mouse. Although, it is noted that adequate surveys have not been conducted to confirm the presence of Water Mouse nests. Stage 2 of the GSC is unlikely to adversely affect habitat critical to the survival of the Water Mouse given: ▪ there will be no direct impacts to coastal wetlands that provide habitat for this species ▪ Stage 2 of the GSC will be setback between 50 m and 140 m from retained coastal wetland habitat ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts e.g. erosion and sedimentation, stormwater quality, acid sulfate soils, light pollution etc) to habitat for this species (refer Sections 4.3.2 and 4.3.3) ▪ appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct).
▪ Disrupt the breeding cycle of an important population	Stage 2 of the GSC is unlikely to breeding cycle of the Water Mouse given: ▪ there will be no direct impacts to coastal wetlands that provide potential breeding habitat for this species ▪ Stage 2 of the GSC will be setback between 50 m and 140 m from retained coastal wetland habitat ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts e.g. erosion and sedimentation, stormwater quality, acid sulfate soils, light pollution etc) to habitat for this species (refer Sections 4.3.2 and 4.3.3) ▪ appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct).
▪ Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Stage 2 of the GSC is unlikely to modify, destroy, isolate or decrease the availability or quality of habitat within the Griffin locality given: ▪ there will be no direct impacts to coastal wetlands that provide potential breeding habitat for this species ▪ Stage 2 of the GSC will be setback between 50 m and 140 m from retained coastal wetland habitat ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts e.g. erosion and sedimentation, stormwater quality, acid

	sulfate soils, light pollution etc) to habitat for this species (refer Sections 4.3.2 and 4.3.3) ▪ appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct). It is also noted that coastal wetlands to the west and south of the project site will also be retained and protected as part of the broader GSC environmental reserve system (Appendix A).
▪ Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Predation by European Red Fox (**Vulpes vulpes*), as well as feral and domestic dogs is a recognised threat to the Water Mouse. Given the proximity to existing residential development, domestic pets are currently likely to occur within the project site. It is intended that once operational dogs will be prohibited from area of retained coastal wetland habitat. Educational signage will also be used to explain the impacts of domestic dogs on the vulnerable Water Mouse It is unlikely that Stage 2 of the GSC will result in the introduction or substantial increase of other feral predators such as European Red Fox.
▪ Introduce disease that may cause the species to decline, or	There are no known pathogens or disease that may cause the Water Mouse to decline. It is unlikely that the activities associated with Stage 2 of the GSC will result in the introduction of a disease that could result in the decline of Water Mouse.
▪ Interfere substantially with the recovery of the species.	Stage 2 of the GSC is unlikely to substantially interfere with the recovery of the Water Mouse given: ▪ direct impacts to habitat critical to the survival of this species have been avoided ▪ adequate setbacks have been included between the Stage 2 footprint and retained coastal wetland habitat ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts e.g. erosion and sedimentation, stormwater quality, acid sulfate soils, light pollution etc) to habitat for this species (refer Sections 4.3.2 and 4.3.3). ▪ areas of coastal wetland habitats to the west and south of the project site will be retained and protected as part of the broader GSC Master Plan (Appendix A) ▪ appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct).
Conclusion: Stage 2 of the GSC is unlikely to cause a significant impact to the Water Mouse given: ▪ direct impacts to habitat critical to the survival of this species have been avoided ▪ adequate setbacks (i.e. >50 m) have been included between the Stage 2 footprint and retained coastal wetland habitat ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts e.g. erosion and sedimentation, stormwater quality, acid sulfate soils, light pollution etc) to habitat for this species (refer Sections 4.3.2 and 4.3.3). ▪ areas of coastal wetland habitats within the project site will be retained, protected and enhanced as part of the broader GSC environmental reserve system (Appendix A) ▪ appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct).	

Impacts to EPBC Act listed migratory species

A number of migratory species have been assessed as having a moderate to high likelihood of occurring within the project site. A number of these species are migratory shorebirds (excluding species also listed as threatened which are addressed in Section 5.3.2 above), which are likely to use coastal wetland habitats within the project site. In addition, Osprey and Fork-tailed Swift are likely to overfly the project site during broader movement throughout the locality.

An assessment of significance for the migratory species listed above has been conducted in accordance with the EPBC Act Significant Impact Guidelines (DotE 2013) for listed migratory species (Table 9). For migratory shorebirds this assessment concluded that the project itself is unlikely to support important habitat (as defined by DotE (2015)) for shorebirds. However, the project site is within close proximity to the Moreton Bay Ramsar wetland that is recognised as an important site for shorebirds.

For the Osprey and Fork-tailed Swift, this assessment concluded that the habitat within the project site is not considered to be "important habitat", as defined in the 'Referral guideline for 14 birds listed migratory under the EPBC Act (DotE, 2015b). Further, there is no evidence that the project site supports an ecologically significant proportion of the population of these migratory species. Offsets are therefore not required for impacts on migratory species, given that Stage 2 of the GSC is not predicted to give rise to a significant, residual impact on these species.

Table 9: Assessment against significant impact criteria for migratory species

Significance criteria	Assessment of significance
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:	
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species;	As discussed for in Table 5, Stage 2 of the GSC is unlikely to substantially modify, destroy or isolate an area of important habitat for migratory shorebirds given: ▪ there will be no direct impacts to coastal wetlands that provide habitat for these species ▪ disturbance resulting from increased human activity at Stage 2 of the GSC will be reduced in the first instance by the 50 m to 140 m setback to coastal wetland habitat ▪ retained coastal wetlands will be protected and enhanced as part of the environmental reserve system included in the broader GSC Master Plan (Appendix A) ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts (e.g. erosion and sedimentation, stormwater quality, acid sulfate soils, light pollution and noise etc) to habitat for this species (refer Sections 4.3.2 and 4.3.3) ▪ appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct). Important habitat for Fork-tailed Swift is not currently defined in the Referral guideline for 14 migratory birds (DotE 2015). At

Significance criteria	Assessment of significance
	present the Referral guidelines for 14 migratory birds (DotE 2015) does not include suggested thresholds of clearing that are likely to have a significant impact on the Fork-tailed Swift. However, the proposed clearing of 9.6 ha is unlikely to significantly modify, fragment or isolate foraging habitat for these species given the pattern of clearing (i.e. a relatively small footprint without direct connectivity to larger tracts of higher quality vegetation in the locality). Coastal wetlands within the project site are consistent with the definition of important habitat for the Osprey as defined by the Referral guideline for 14 migratory birds (DotE 2015) (i.e. mangrove swamps and coastal lands). However, as noted above, Stage 2 of the GSC does not involve any direct impacts to coastal wetlands, appropriate buffers between the sporting precinct and retained coastal wetlands have been included in the layout and indirect impacts will be manged during both the construction and operational phases of the project.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or	Disturbance by domestic dogs is a recognised threat to critically endangered and endangered migratory shorebirds. Given the proximity to existing residential development, domestic pets are currently likely to occur within the project site. It is intended that once operational the GSC will be managed as: ▪ dogs prohibited from areas outside of the Stage 2 footprint ▪ dogs on-leash within the Stage 2 precinct (i.e. sports fields, tennis courts, club houses etc). It is unlikely that Stage 2 of the GSC will result in the introduction or substantial increase of other feral predators such as European Red Fox. The Referral guideline for 14 migratory species (DotE 2015) does not include any known invasive species that may be harmful to Fork-tailed Swift. Therefore, it is unlikely that an invasive species, that is harmful to these migratory species, will become established in important habitat as a result of Stage 2 of the GSC. The Referral guideline for 14 migratory birds (DotE 2015) recognises any invasive species that greatly reduces fish abundance as being a threat to the Osprey. Similarly, given the terrestrial nature of Stage 2 of the GSC, the project is unlikely to result in any impacts to fish abundance as result of invasive species.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of the migratory species.	The majority of migratory shorebirds that are considered likely to occur within the project site, except the Gull-billed Tern, either do not breed in Australia or do not breed in south-east Queensland. Stage 2 of the GSC is unlikely to seriously disrupt elements of the lifecycle that occur in Australia given that: ▪ ecologically significant numbers of migratory birds were not recorded during field surveys ▪ there will be no direct impacts to coastal wetlands that provide habitat for these species ▪ retained coastal wetlands will be protected and enhanced as part of the environmental reserve system included in the broader GSC Master Plan (Appendix A) ▪ disturbance resulting from increased human activity at Stage 2 of the GSC will be reduced instance by the 50 m to 140 m setback to coastal wetland habitat ▪ appropriate management measures will be employed during the construction and operational phases of the project to

Significance criteria	Assessment of significance
	minimise the risk of indirect impacts (e.g. erosion and sedimentation, stormwater quality, acid sulfate soils, light pollution and noise etc) to habitat for this species (refer Sections 4.3.2 and 4.3.3) ▪ there will be appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct). An ecologically significant proportion of the population of Osprey and Fork-tailed Swift as defined in the Referral guideline for 14 migratory birds is considered unlikely to occur in the project site. Therefore, the project will not seriously disrupt the lifecycle of an ecologically significant proportion of the population of a migratory species.
Conclusion: Stage 2 of the GSC will not cause a significant impact to migratory species listed under the EPBC Act.	

Impacts to Wetlands of International Importance

The project site is located within close proximity to the Moreton Bay Ramsar Wetland. Coastal wetlands within the project site connect with and drain into the broader network of similar habitat that is encompassed by this important wetland.

Stage 2 of the GSC has been specifically designed to avoid direct impact to coastal wetlands within the project site. In addition, the Stage 2 footprint has been setback at least 50 m from retained coastal wetland habitats. An assessment against the EPBC Act significant impact guidelines for declared Ramsar wetlands is provided in Table 10 below.

Table 10: Assessment against significant impact criteria for the Moreton Bay Ramsar wetland

Significance criteria	Assessment of significance
An action is likely to have a significant impact on the ecological character of a declared Ramsar wetland if there is a real chance or possibility that it will result in:	
▪ areas of the wetland being destroyed or substantially modified	Stage 2 of the GSC is unlikely to substantially modify or destroy the Moreton Bay Ramsar wetland given: ▪ the project site is not located within the Moreton Bay Ramsar wetland ▪ there will be no direct impacts to coastal wetlands within the project site that connect with similar habitat within the Moreton Bay Ramsar wetland ▪ retained coastal wetlands will be protected and enhanced as part of the environmental reserve system included in the broader GSC Master Plan (Appendix A) ▪ Stage 2 of the GSC will be setback between 50 m and 140 m from retained coastal wetland habitat ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts (e.g. erosion and sedimentation, stormwater quality, acid sulfate soils, light

Significance criteria	Assessment of significance
An action is likely to have a significant impact on the ecological character of a declared Ramsar wetland if there is a real chance or possibility that it will result in:	
	pollution and noise etc) to habitat for this species (refer Sections 4.3.2 and 4.3.3) ▪ disturbance resulting from increased human activity at Stage 2 of the GSC will be reduced instance by the setback to coastal wetland habitat ▪ there will be appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct).
▪ a substantial and measurable change in the hydrological regime of the wetland, for example, a substantial change to the volume, timing, duration and frequency of ground and surface water flows to and within the wetland	Stage 2 of the GSC is unlikely to result in a substantial and measurable change in the hydrological regime of the Moreton Bay Ramsar wetland. The GSC Master Plan has been informed by preliminary flood and stormwater management assessments. More detailed assessments will be required as the project progresses through the detailed design phase. In addition, a formal stormwater management plan will be prepared in support of development applications at the State and Local Government levels. In order to gain relevant approvals, the management plan will need to demonstrate that Stage 2 of the GSC will have a non-worsening effect on stormwater quantity, quality and downstream flood levels.
▪ the habitat or lifecycle of native species, including invertebrate fauna and fish species, dependent upon the wetland being seriously affected	Stage 2 of the GSC is unlikely to seriously disrupt habitat or lifecycle of native species dependent on the Moreton Bay Ramsar wetland given that: ▪ the project site is not located within the Moreton Bay Ramsar wetland ▪ there will be no direct impacts to coastal wetlands within the project site that connect with similar habitat within the Moreton Bay Ramsar wetland ▪ retained coastal wetlands will be protected and enhanced as part of the environmental reserve system included in the broader GSC Master Plan (Appendix A) ▪ Stage 2 of the GSC will be setback between 50 m and 140 m from retained coastal wetland habitat ▪ appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts (e.g. erosion and sedimentation, stormwater quality, acid sulfate soils, light pollution and noise etc) to habitat for this species (refer Sections 4.3.2 and 4.3.3) ▪ disturbance resulting from increased human activity at Stage 2 of the GSC will be reduced instance by the setback to coastal wetland habitat ▪ there will be appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct).
▪ a substantial and measurable change in the water quality of the wetland – for example, a substantial change in the level of salinity, pollutants, or nutrients in the wetland, or water temperature which may adversely impact on	Stage 2 of the GSC is unlikely to have a substantial and measurable change in the water quality of the wetland. The highest risk of environmental harm associated with water quality is associated with the construction phase of development. As detailed in Section 4.3.2, the CEMP for the project (Duke Environmental, 2016a) provides measures to minimise the risk of erosion, sedimentation and adverse impacts to water quality during construction of Stage 2. Section 3.4.3 discusses management of water quality during the operational phase of Stage 2 of the GSC. As noted above, a formal

Significance criteria	Assessment of significance
An action is likely to have a significant impact on the ecological character of a declared Ramsar wetland if there is a real chance or possibility that it will result in:	
biodiversity, ecological integrity, social amenity or human health, or	stormwater management plan will be prepared in support of development applications at the State and Local Government levels. In order to gain relevant approvals, the management plan will need to demonstrate that Stage 2 of the GSC will have a non-worsening effect on stormwater quantity and quality.
▪ an invasive species that is harmful to the ecological character of the wetland being established (or an existing invasive species being spread) in the wetland.	Given the proximity to existing residential development, domestic pets are currently likely to occur within the project site. It is intended that once operational dogs will be prohibited from area of retained coastal wetland habitat. Educational signage will also be used to explain the impacts of domestic dogs on the vulnerable Water Mouse It is unlikely that Stage 2 of the GSC will result in the introduction or substantial increase of other feral predators such as European Red Fox.
Conclusion: Stage 2 of the GSC will not cause a significant impact to the Moreton Bay Ramsar wetland.	

5.4 Residual impacts and offset liability

Biodiversity offsets are required under the EPBC Act if an action is likely to give rise to a significant residual impact on MNES. The EPBC Act Environmental Offsets Policy (SEWPaC 2012) details requirements under the EPBC Act in relation to biodiversity offsets. The Significant Impact Guidelines 1.1: Matters of National Environmental Significance (DotE 2013) provides guidance to assist with determining whether an impact is considered significant. For some species, there are also species-specific guidelines available to assist with determining whether an impact is considered to be significant (e.g. EPBC Act referral guidelines for the vulnerable Koala (DotE 2014)).

The assessments of significance provided in Section 5.1 – 5.5 describe and assess the potential impacts on MNES associated with Stage 2 of the GSC. The assessments concluded that there will be no significant residual impact to MNES given that:

- direct impacts to terrestrial habitats have been minimised as far as practical
- direct impacts to coastal wetlands have been avoided
- the pattern of clearing required to construct Stage 2 of the GSC will not result in fragmentation of terrestrial habitat
- terrestrial and coastal wetlands habitat outside of the Stage 2 footprint will be retained, protected and enhanced as part of the GSC environmental reserve system
- appropriate management measures will be employed during the construction and operational phases of the project to minimise the risk of indirect impacts to MNES and/or their habitat (refer Sections 4.3.2 and 4.3.3)

- there will be appropriate management of domestic dogs (i.e. prohibited in areas outside of the Stage 2 footprint and on-leash only within the sporting precinct)
- the retention, protection and enhancement of terrestrial habitats within the project site and broader GSC Master Plan area, will provide a net benefit to MNES, particularly the Koala via planting of approximately 3,000 locally important Koala habitat trees.

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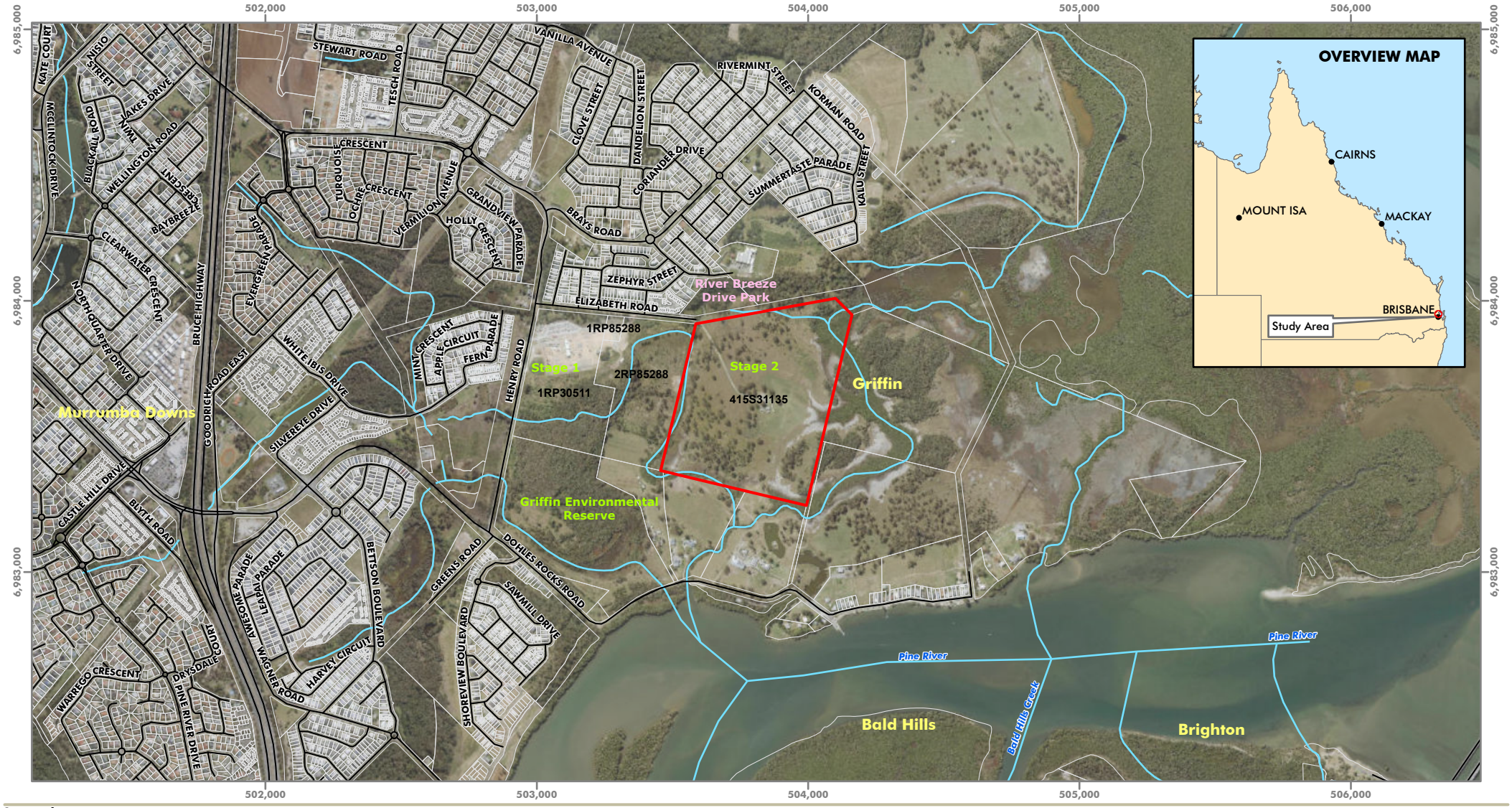
Figures



Legend

- Study Area
- Road
- Vegetation Management Act watercourse
- Cadastral boundary

N

0 0.5 1

Kilometers

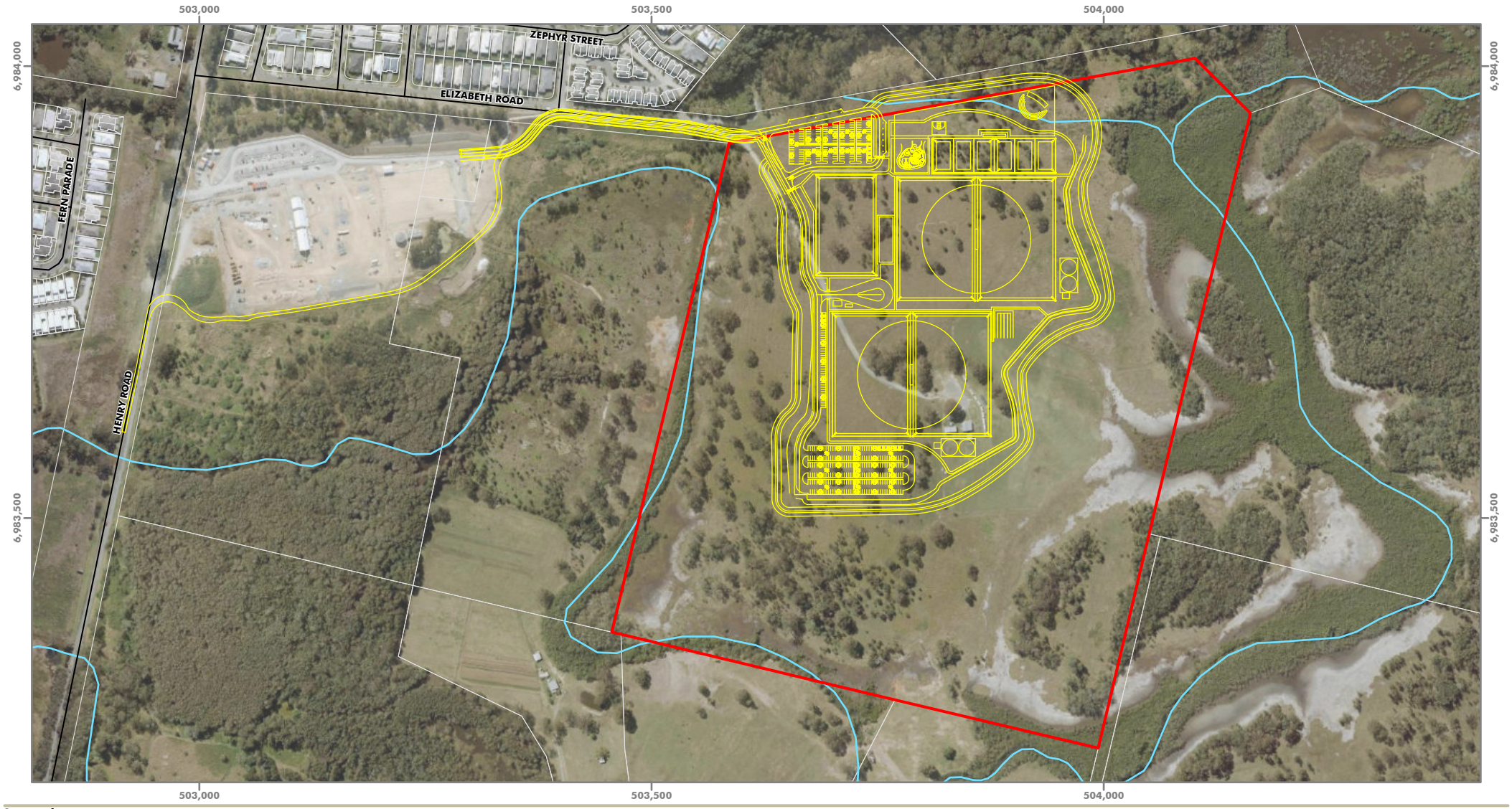
Figure 1 : Locality Plan

Griffin Sports Park – Stage 2

Ecological Assessment Report (MNES)

Map Number: 22016_MNES_01_B
Date: 07 October 2022
Map Projection: GDA 1994 MGA Zone 56
Imagery: (c) Digital Globe
Data: Road, Rail, Watercourse - (c) DNRM 2022

ECO SOLUTIONS & MANAGEMENT



Legend

- Study Area
- Project layout
- Road
- Vegetation Management Act watercourse
- Cadastral boundary

N

0 100 200 300

Metres

Figure 2 : Project layout

Griffin Sports Park – Stage 2

Ecological Assessment Report (MNES)

Map Number: 22016_MNES_02_D
Date: 07 October 2022
Map Projection: GDA 1994 MGA Zone 56
Imagery: (c) Digital Globe
Data: Road, Rail, Watercourse - (c) DNRM 2022

ECO SOLUTIONS & MANAGEMENT

Legend

- Study Area
- Griffin Sports Complex
- Road
- Vegetation Management Act watercourse
- Cadastral boundary
- Moreton Bay Ramsar Wetland
- Hays Inlet Declared Fish Habitat area
- Moreton Bay Marine Park
- Hays Inlet Conservation Park

N

0 250 500 750 1,000

Metres

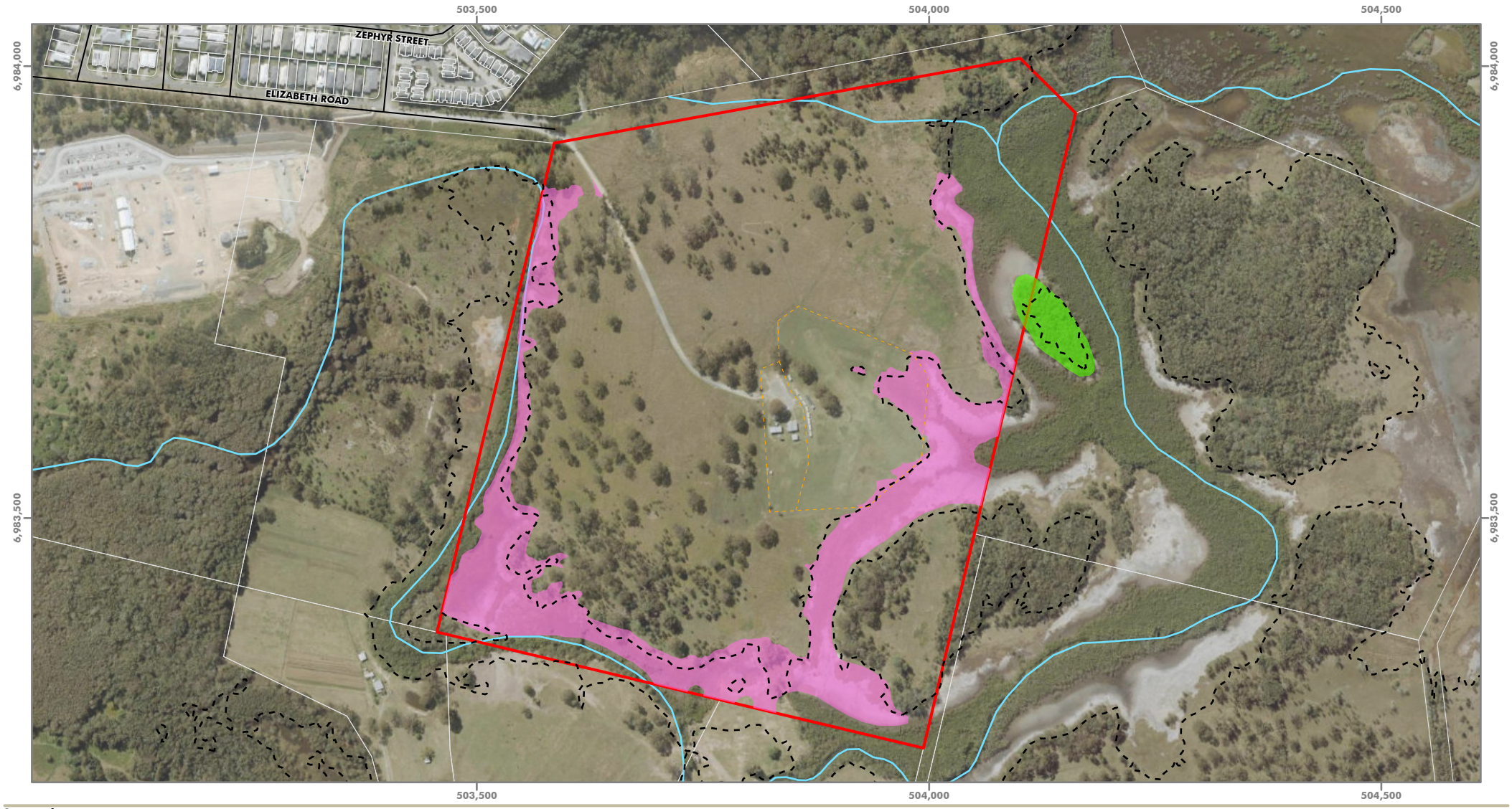
Figure 3 : Environmental values

Griffin Sports Park – Stage 2

Ecological Assessment Report (MNES)

Map Number: 22016_MNES_03_B
Date: 07 October 2022
Map Projection: GDA 1994 MGA Zone 56
Imagery: (c) Digital Globe
Data: Road, Rail, Watercourse - (c) DNRM 2022

ECO SOLUTIONS & MANAGEMENT



Legend

- Study Area
- Road
- Railway
- Vegetation Management Act watercourse
- Cadastral boundary
- Fencline
- Highest Astronomical Tide
- Costal Saltmarsh TEC
- Swamp Oak TEC

N

0 100 200 300

Metres

Figure 4 : Threatened Ecological Communities

Griffin Sports Park – Stage 2

Ecological Assessment Report (MNES)

Map Number: 22016_MNES_04_B
Date: 07 October 2022
Map Projection: GDA 1994 MGA Zone 56
Imagery: (c) Digital Globe
Data: Road, Rail, Watercourse - (c) DNRM 2022

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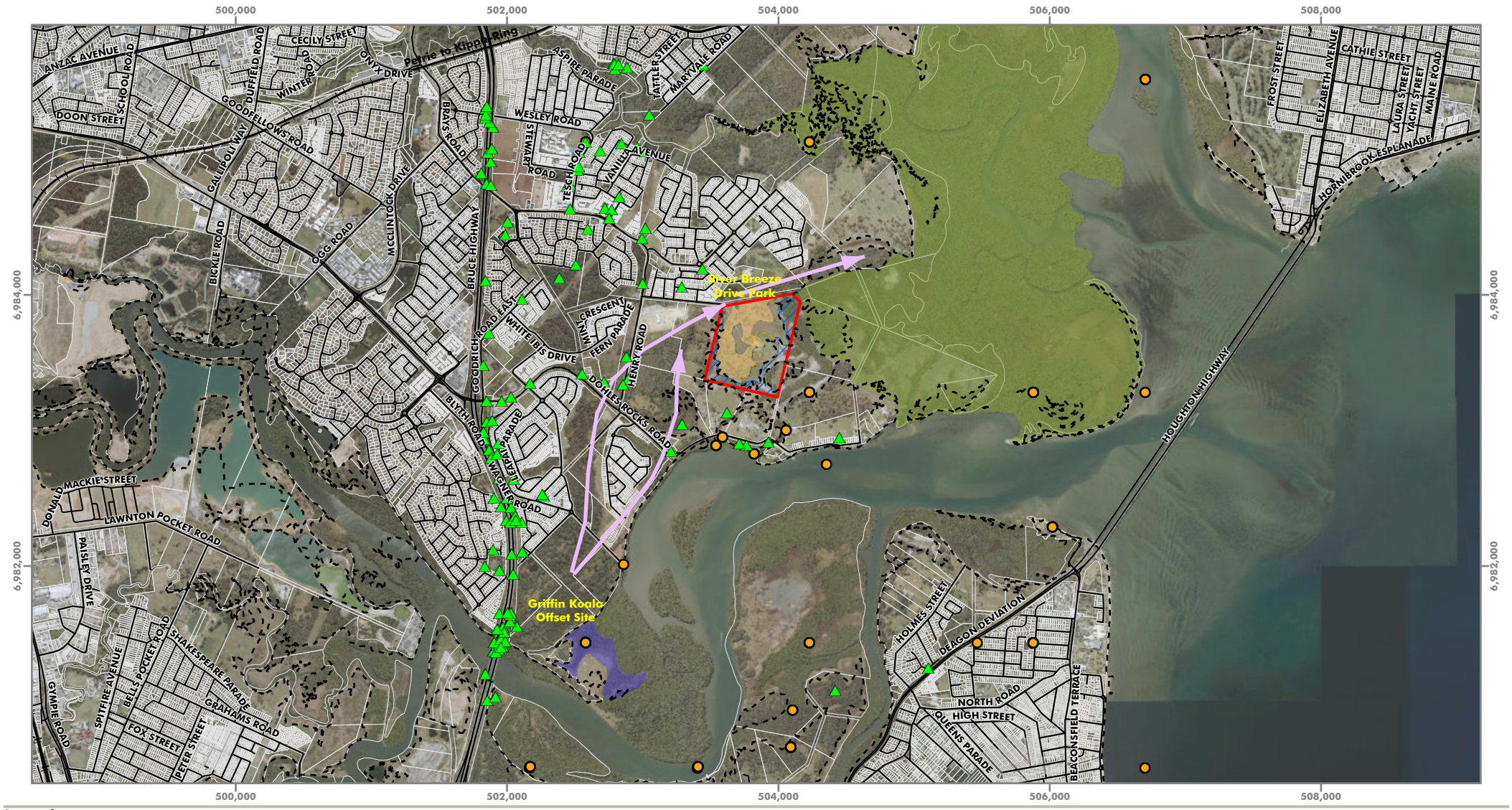


Legend

- Study Area
- Road
- Railway
- Highest Astronomical Tide
- Fencline
- Koala Movement Corridor
- Water Mouse and Migratory Shorebird habitat
- Grey-headed Flying-fox habitat
- Cadastral boundary

Shorebird Habitat

- High Tide Roost Site
- Potential Roosting Habitat

Wildnet Records

- Migratory Birds
- Koala

N

0 0.5 1 1.5

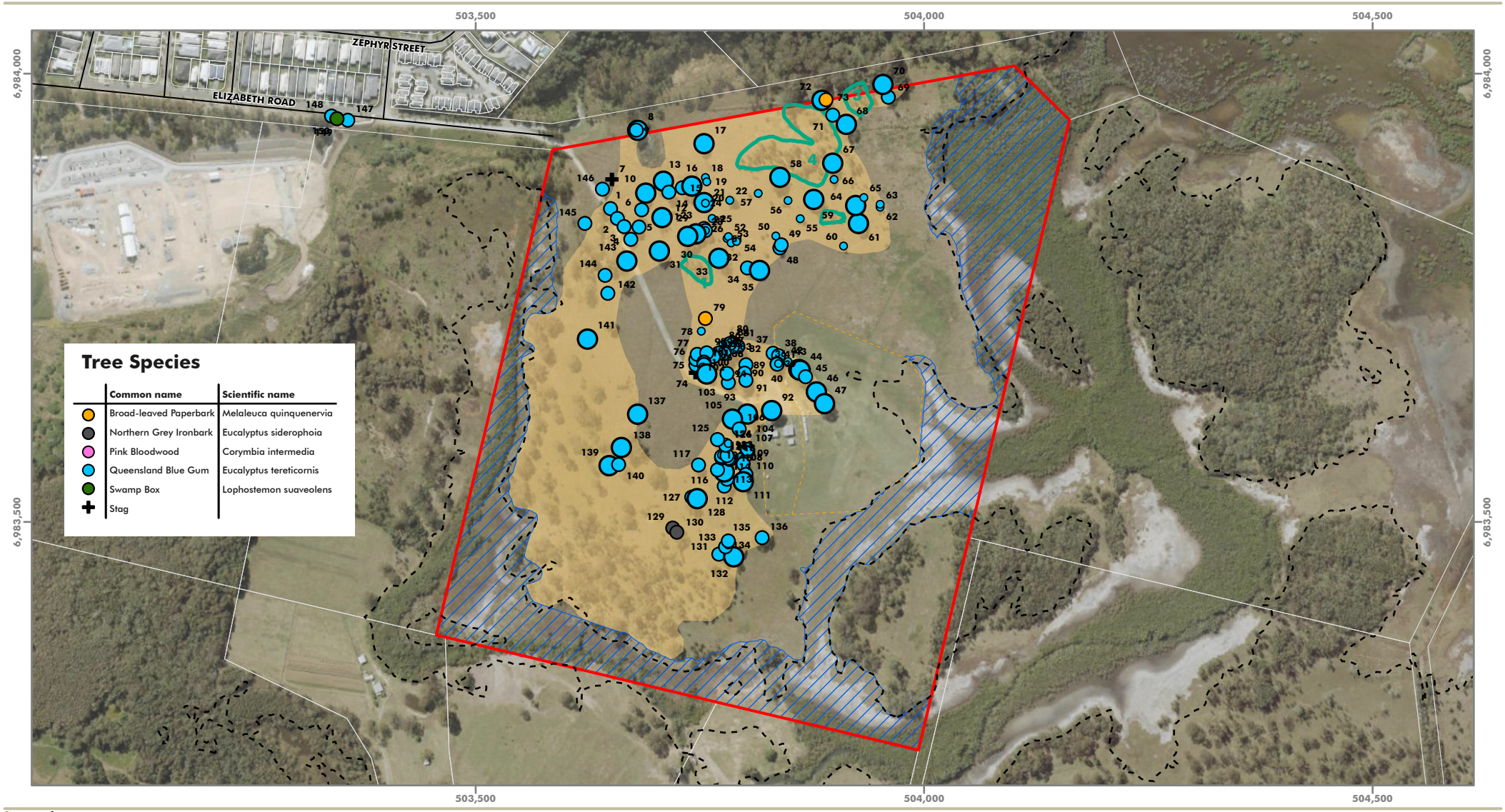
Kilometres

Figure 5 : Koala movement and shorebird habitat in the locality

Griffin Sports Park – Stage 2
Ecological Assessment Report (MNES)

Map Number: 22016_MNES_05_C
Date: 02 November 2022
Map Projection: GDA 1994 MGA Zone 56
Imagery: (c) Digital Globe
Data: Road, Rail, Watercourse - (c) DNRM 2022

ECO SOLUTIONS & MANAGEMENT



Legend

- Study Area
- Road
- Railway
- Highest Astronomical Tide
- Fenceline
- Cadastral boundary
- Water Mouse and Migratory Shorebird habitat
- Grey-headed Flying-fox habitat
- Regrowth Koala Habitat Trees

N

0 100 200 300

Metres

Tree DBH Legend

DBH (mm)
100 - 290
300 - 590
600+

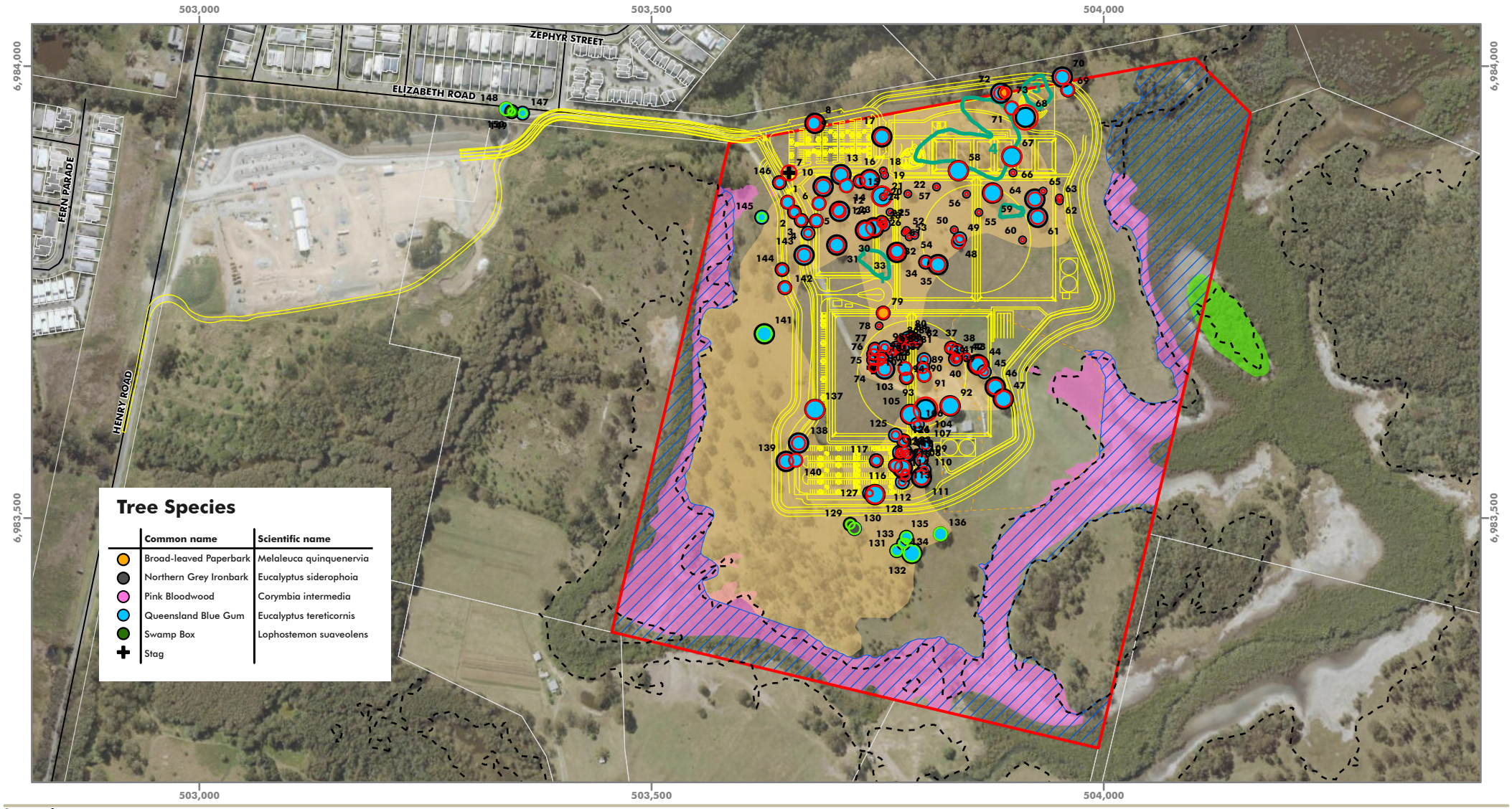
Figure 6 : Threatened fauna habitat

Griffin Sports Park – Stage 2

Ecological Assessment Report (MNES)

Map Number: 22016_MNES_06_E
Date: 31 October 2022
Map Projection: GDA 1994 MGA Zone 56
Imagery: (c) Digital Globe
Data: Road, Rail, Watercourse - (c) DNRM 2022

ECO SOLUTIONS & MANAGEMENT



Legend

- Study Area
- Project layout
- Road
- Highest Astronomical Tide
- Fencline
- Cadastral boundary
- Grey-headed Flying-fox habitat
- Water Mouse and Migratory Shorebird habitat
- Costal Saltmarsh TEC
- Swamp Oak TEC
- Tree to be retained
- tree to be removed
- Regrowth Koala Habitat Trees

N

0 100 200 300

Metres

Tree DBH Legend

DBH (mm)
100 - 290
300 - 590
600+

Figure 7 : Impacts to MNES

Griffin Sports Park – Stage 2
Ecological Assessment Report (MNES)

Map Number: 22016_MNES_07_G
Date: 31 October 2022
Map Projection: GDA 1994 MGA Zone 56
Imagery: (c) Digital Globe
Data: Road, Rail, Watercourse - (c) DNRM 2022

ECO SOLUTIONS & MANAGEMENT

503,000 503,500 504,000

6,984,000

6,983,500

ELIZABETH ROAD

SANTA ANA LANE

FERN PARADE

HAUL ROAD

HENRY ROAD

MOSQUITO BUFFER

MOSQUITO BUFFER

Tree Species

Common name	Scientific name
Broad-leaved Paperbark	Melaleuca quinquenervia
Northern Grey Ironbark	Eucalyptus siderophoia
Pink Bloodwood	Corymbia intermedia
Queensland Blue Gum	Eucalyptus tereticornis
Swamp Box	Lophostemon suaveolens
Stag	

Polygon No.	Common name	Scientific name	No. Non-juveniles
1	Queensland Blue Gum	Eucalyptus tereticornis	33
2	Queensland Blue Gum	Eucalyptus tereticornis	7
3	Queensland Blue Gum	Eucalyptus tereticornis	20
4	Queensland Blue Gum	Eucalyptus tereticornis	128
	Broad-leaved Paperbark	Melaleuca quinquenervia	1

Notes:
Non-juveniles - trees 4-8m height, 30-150mm DBH

503,000 503,500 504,000

Legend

- Study Area
- Project layout
- Road
- Cadastral boundary
- Tree to be retained
- tree to be removed
- Regrowth Koala Habitat Trees
- Buffer to HES Wetland

N

0 50 100 200

Metres

Tree DBH Legend

DBH (mm)
100 - 290
300 - 590
600+

Figure 8 : Impacts to Koala habitat

Griffin Sports Park – Stage 2
Ecological Assessment Report (MNES)

Map Number: 22016_MNES_08_E
Date: 28 October 2022
Map Projection: GDA 1994 MGA Zone 56
Data: Roads, Railway, Watercourse - (c)DNRM 2022

ECO SOLUTIONS & MANAGEMENT

Appendix A

Approved Master Plan

THE DRAFT LANDSCAPE MASTER PLAN

Appendix B

Database search results

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: 20-Sep-2022

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.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	82
Listed Migratory Species:	80

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

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 http://www.environment.gov.au/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.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	112
Whales and Other Cetaceans:	13
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	4
Regional Forest Agreements:	None
Nationally Important Wetlands:	2
EPBC Act Referrals:	32
Key Ecological Features (Marine):	None
Biologically Important Areas:	6
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Moreton bay	Within Ramsar site	In feature area

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
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community may occur within area	In feature area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur within area	In feature area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	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
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area	In feature area
FISH			
Epinephelus daemelii Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
FROG			
Mixophyes fleayi Fleay's Frog [25960]	Endangered	Species or species habitat may occur within area	In feature area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat may occur within area	In buffer area only
INSECT			
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area	In feature area
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	Endangered	Species or species habitat may occur within area	In buffer area only
MAMMAL			
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area	In feature area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dasyurus maculatus maculatus (SE mainland population)			
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
Eubalaena australis			
Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Macroderma gigas			
Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area	In feature area
Petauroides volans			
Greater Glider (southern and central) [254]	Endangered	Species or species habitat likely to occur within area	In feature area
Petaurus australis australis			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
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
Potorous tridactylus tridactylus			
Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat may occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Xeromys myoides			
Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat likely to occur within area	In feature area
PLANT			
Arthraxon hispidus			
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Bosistoa transversa			
Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Cryptocarya foetida Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat may occur within area	In feature area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area	In feature area
Cupaniopsis shirleyana Wedge-leaf Tuckeroo [3205]	Vulnerable	Species or species habitat may occur within area	In feature area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Macadamia ternifolia Small-fruited Queensland Nut, Gympie Nut [7214]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat may occur within area	In feature area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area	In feature area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area	In feature area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area	In feature area
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area	In feature area
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat may occur within area	In feature area
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
SHARK			
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Breeding likely to occur within area	In feature area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sphyrna lewini Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Ardenna grisea Sooty Shearwater [82651]		Species or species habitat may occur within area	In feature area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In feature area
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Marine Species			
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area
Dugong dugon Dugong [28]		Species or species habitat known to occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eubalaena australis as Balaena glacialis australis			
Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Lamna nasus			
Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In feature area
Lepidochelys olivacea			
Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Megaptera novaeangliae			
Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Mobula alfredi as Manta alfredi			
Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In feature area
Mobula birostris as Manta birostris			
Giant Manta Ray [90034]		Species or species habitat may occur within area	In feature area
Natator depressus			
Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Orcaella heinsohni			
Australian Snubfin Dolphin [81322]		Species or species habitat likely to occur within area	In feature area
Orcinus orca			
Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Pristis zijsron			
Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Breeding likely to occur within area	In feature area
Rhincodon typus			
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sousa sahulensis as Sousa chinensis Australian Humpback Dolphin [87942]		Breeding known to occur within area	In feature area
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area	In feature area
Calidris alba Sanderling [875]		Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area	In feature area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Roosting known to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area	In feature area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area	In feature area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area	In feature area
Limnodromus semipalmatus Asian Dowitcher [843]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting known to occur within area	In feature area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Philomachus pugnax Ruff (Reeve) [850]		Roosting known to occur within area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In feature area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area	In feature area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In feature area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area	In feature area
Tringa incana Wandering Tattler [831]		Roosting known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area	In feature area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]		Species or species habitat may occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Breeding likely to occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area	In feature area
Calidris alba Sanderling [875]		Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area	In feature area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area overfly marine area	In feature area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area	In feature area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area	In feature area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Roosting known to occur within area overfly marine area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat known to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area overfly marine area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area	In feature area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area overfly marine area	In feature area
Limnodromus semipalmatus Asian Dowitcher [843]		Species or species habitat known to occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area overfly marine area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting known to occur within area overfly marine area	In feature area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In feature area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In feature area
Philomachus pugnax Ruff (Reeve) [850]		Roosting known to occur within area overfly marine area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area overfly marine area	In feature area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In feature area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area overfly marine area	In feature area
Tringa incana as Heteroscelus incanus Wandering Tattler [831]		Roosting known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area	In feature area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area overfly marine area	In feature area
Fish			
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area	In buffer area only
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area	In buffer area only
Corythoichthys amplexus Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Corythoichthys ocellatus Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area	In buffer area only
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area	In buffer area only
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area	In buffer area only
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area	In buffer area only
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area	In buffer area only
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area	In buffer area only
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area	In buffer area only
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area	In buffer area only
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area	In buffer area only
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area	In buffer area only
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In buffer area only
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In buffer area only
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area	In buffer area only
Micrognathus brevirostris thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area	In buffer area only
Microphis manadensis Manado Pipefish, Manado River Pipefish [66258]		Species or species habitat may occur within area	In buffer area only
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area	In buffer area only
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area	In buffer area only
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area	In buffer area only
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area	In buffer area only
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In buffer area only
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In buffer area only
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area	In buffer area only
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In buffer area only
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In buffer area only
Mammal			
Dugong dugon Dugong [28]		Species or species habitat known to occur within area	In buffer area only
Reptile			
Aipysurus laevis Olive Seasnake [1120]		Species or species habitat may occur within area	In buffer area only
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Emydocephalus annulatus Turtle-headed Seasnake [1125]		Species or species habitat may occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area	In buffer area only
Laticauda laticaudata a sea krait [1093]		Species or species habitat may occur within area	In buffer area only
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area	In buffer area only

Whales and Other Cetaceans [Resource Information]

Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Orcaella heinsohni as Orcaella brevirostris Australian Snubfin Dolphin [81322]		Species or species habitat likely to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Sousa sahulensis as Sousa chinensis Australian Humpback Dolphin [87942]		Breeding known to occur within area	In feature area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Hay's Inlet	Fish Habitat Area (A)	QLD	In feature area
Hays Inlet 1	Conservation Park	QLD	In buffer area only
Hays Inlet 2	Conservation Park	QLD	In buffer area only
Moreton Bay	Marine Park	QLD	In feature area

Nationally Important Wetlands [Resource Information]

Wetland Name	State	Buffer Status
Moreton Bay	QLD	In buffer area only
Pine River and Hayes Inlet	QLD	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Construction of dual-track electrified railway lines	2002/586	Controlled Action	Completed	In buffer area only
Petrie Mill redevelopment project, Qld	2016/7839	Controlled Action	Post-Approval	In buffer area only
redevelopment of waste water treatment plant	2005/2028	Controlled Action	Completed	In buffer area only
Sandgate Waste Water Treatment Plant Augmentation Works	2001/262	Controlled Action	Post-Approval	In feature area
Not controlled action				
56 Lot Industrial subdivision and associated infrastructure construction activities adjacent to Hays	2004/1553	Not Controlled Action	Completed	In feature area
Brisbane Airport Link Tunnel Project	2005/2487	Not Controlled Action	Completed	In buffer area only
Concrete Batching plant	2003/1245	Not Controlled Action	Completed	In feature area
Construction of public access road and open drain to service Nudgee Landfill rem	2004/1486	Not Controlled Action	Completed	In buffer area only
Development of residential community at Lawnton Pocket Road	2004/1571	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Dohles Rocks residential subdivision and development	2004/1494	Not Controlled Action	Completed	In feature area
Flinders Parade - Arthur Davies Park upgrade works	2006/3076	Not Controlled Action	Completed	In buffer area only
Gateway Motorway Upgrade	2003/1297	Not Controlled Action	Completed	In buffer area only
Gateway Upgrade North (GUN) Project, Southeast Qld	2013/7066	Not Controlled Action	Completed	In buffer area only
Houghton Highway Bridge Duplication	2007/3680	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Installation of a sewer rising main and replacement of the existing PVC rising m	2005/2058	Not Controlled Action	Completed	In buffer area only
Moora Park and Wynnum Central Park foreshore upgrades	2006/2916	Not Controlled Action	Completed	In buffer area only
Moreton Bay Rail Link between Petrie Station and Kippa Ring (Redcliffe)	2010/5589	Not Controlled Action	Completed	In buffer area only
recreational improvements at Manly, Wynnum & Sandgate	2005/2488	Not Controlled Action	Completed	In buffer area only
Rehabilitation of Dowse Lagoon, Sandgate	2004/1401	Not Controlled Action	Completed	In feature area
Replacement of existing composting toilets at the Boondall Interpretive Centre	2003/1140	Not Controlled Action	Completed	In feature area
Residential Development, Morris Road	2006/2661	Not Controlled Action	Completed	In buffer area only
Residential Subdivision, Freshwater Development, Brays Road	2004/1606	Not Controlled Action	Completed	In feature area
residential subdivision, park & infrastructure	2003/1216	Not Controlled Action	Completed	In feature area
Site preparation for residential dwelling, Lot 79, Gregory Road	2004/1499	Not Controlled Action	Completed	In buffer area only
The North-South Bypass Tunnel (NSBT)	2004/1741	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
2011 World Water Ski Racing Championship	2010/5596	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Duplication of the South Pine to Hays Inlet 110kV overhead power transmission li	2009/4870	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
North Lakes Development	2001/520	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Proposed Commercial Light Industry Sites and Transportable Home Park	2009/5209	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Residential development, Kinsellas Road	2004/1849	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Residential Development of Lot 1 located at 1977 Anzac Avenue, Mango Hill, QLD	2013/6858	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only

Biologically Important Areas

Scientific Name	Behaviour	Presence	Buffer Status
Dolphins			
Sousa chinensis Indo-Pacific Humpback Dolphin [50]	Breeding	Known to occur	In buffer area only
Tursiops aduncus Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Known to occur	In buffer area only
Marine Turtles			
Caretta caretta Loggerhead Turtle [1763]	Nesting	Known to occur	In feature area
Chelonia mydas Green Turtle [1765]	Foraging	Known to occur	In feature area
Sharks			
Carcharias taurus Grey Nurse Shark [64469]	Foraging	Known to occur	In buffer area only

Scientific Name	Behaviour	Presence	Buffer Status
Whales			
Megaptera novaeangliae			
Humpback Whale [38]	Resting on migration (southbound)	Known to occur	In buffer area only

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.

Queensland Government

WildNet species list

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Queensland status: All
Records: All
Date: All
Latitude: -27.2701
Longitude: 153.0382
Distance: 5
Email: steve.marston@ecosm.com.au
Date submitted: Tuesday 20 Sep 2022 20:52:50
Date extracted: Tuesday 20 Sep 2022 21:00:02

The number of records retrieved = 748

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Bufonidae	*Rhinella marina*	cane toad	Y			29
animals	amphibians	Hylidae	*Litoria balatus*	slender bleating tree frog		C		3
animals	amphibians	Hylidae	*Litoria caerulea*	common green treefrog		C		10
animals	amphibians	Hylidae	*Litoria fallax*	eastern sedgefrog		C		33
animals	amphibians	Hylidae	*Litoria gracilenta*	graceful treefrog		C		9
animals	amphibians	Hylidae	*Litoria nasuta*	striped rocketfrog		C		6
animals	amphibians	Limnodynastidae	*Limnodynastes peronii*	striped marshfrog		C		68
animals	amphibians	Limnodynastidae	*Limnodynastes tasmaniensis*	spotted grassfrog		C		5
animals	amphibians	Limnodynastidae	*Limnodynastes terraereginae*	scarlet sided pobblebonk		C		2
animals	amphibians	Limnodynastidae	*Platyplectrum ornatum*	ornate burrowing frog		C		2
animals	amphibians	Myobatrachidae	*Crinia parinsignifera*	beeping froglet		C		6
animals	amphibians	Myobatrachidae	*Crinia signifera*	clicking froglet		C		2
animals	amphibians	Myobatrachidae	*Crinia tinnula*	wallum froglet		V		2
animals	amphibians	Myobatrachidae	*Pseudophryne coriacea*	red backed broodfrog		C		9
animals	amphibians	Myobatrachidae	*Pseudophryne major*	great brown broodfrog		C		5/1
animals	amphibians	Myobatrachidae	*Pseudophryne raveni*	copper backed broodfrog		C		1
animals	birds	Acanthizidae	*Acanthiza chrysorrhoa*	yellow-rumped thornbill		C		4
animals	birds	Acanthizidae	*Acanthiza lineata*	striated thornbill		C		5
animals	birds	Acanthizidae	*Acanthiza nana*	yellow thornbill		C		2
animals	birds	Acanthizidae	*Acanthiza pusilla*	brown thornbill		C		16
animals	birds	Acanthizidae	*Acanthiza reguloides*	buff-rumped thornbill		C		6
animals	birds	Acanthizidae	*Gerygone levigaster*	mangrove gerygone		C		130
animals	birds	Acanthizidae	*Gerygone mouki*	brown gerygone		C		10
animals	birds	Acanthizidae	*Gerygone olivacea*	white-throated gerygone		C		36
animals	birds	Acanthizidae	*Pyrrholaemus sagittatus*	speckled warbler		C		1
animals	birds	Acanthizidae	*Sericornis citreogularis*	yellow-throated scrubwren		C		2
animals	birds	Acanthizidae	*Sericornis frontalis*	white-browed scrubwren		C		64
animals	birds	Acanthizidae	*Sericornis magnirostra*	large-billed scrubwren		C		3
animals	birds	Acanthizidae	*Smicrornis brevirostris*	weebill		C		3
animals	birds	Accipitridae	*Accipiter cirrocephalus*	collared sparrowhawk		C		20
animals	birds	Accipitridae	*Accipiter fasciatus*	brown goshawk		C		25
animals	birds	Accipitridae	*Accipiter novaehollandiae*	grey goshawk		C		10
animals	birds	Accipitridae	*Aquila audax*	wedge-tailed eagle		C		13
animals	birds	Accipitridae	*Aviceda subcristata*	Pacific baza		C		28
animals	birds	Accipitridae	*Circus approximans*	swamp harrier		C		32
animals	birds	Accipitridae	*Circus assimilis*	spotted harrier		C		2
animals	birds	Accipitridae	*Elanus axillaris*	black-shouldered kite		C		45
animals	birds	Accipitridae	*Haliaeetus leucogaster*	white-bellied sea-eagle		C		154
animals	birds	Accipitridae	*Haliastur indus*	brahminy kite		C		255
animals	birds	Accipitridae	*Haliastur sphenurus*	whistling kite		C		429
animals	birds	Accipitridae	*Hieraaetus morphnoides*	little eagle		C		11
animals	birds	Accipitridae	*Lophoictinia isura*	square-tailed kite		C		18
animals	birds	Accipitridae	*Milvus migrans*	black kite		C		9
animals	birds	Accipitridae	*Pandion cristatus*	eastern osprey		SL		168
animals	birds	Acrocephalidae	*Acrocephalus australis*	Australian reed-warbler		C		45
animals	birds	Aegothelidae	*Aegotheles cristatus*	Australian owlet-nightjar		C		17

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Alcedinidae	*Ceyx azureus*	azure kingfisher		C		31
animals	birds	Anatidae	*Anas castanea*	chestnut teal		C		590
animals	birds	Anatidae	*Anas gracilis*	grey teal		C		170
animals	birds	Anatidae	*Anas platyrhynchos*	northern mallard	Y			5
animals	birds	Anatidae	*Anas sp.*			C		1
animals	birds	Anatidae	*Anas superciliosa*	Pacific black duck		C		339
animals	birds	Anatidae	*Aythya australis*	hardhead		C		95
animals	birds	Anatidae	*Biziura lobata*	musk duck		C		3
animals	birds	Anatidae	*Chenonetta jubata*	Australian wood duck		C		183
animals	birds	Anatidae	*Cygnus atratus*	black swan		C		70
animals	birds	Anatidae	*Dendrocygna arcuata*	wandering whistling-duck		C		34
animals	birds	Anatidae	*Dendrocygna eytoni*	plumed whistling-duck		C		8
animals	birds	Anatidae	*Dendrocygna sp.*			C		1
animals	birds	Anatidae	*Malacorhynchus membranaceus*	pink-eared duck		C		9
animals	birds	Anatidae	*Nettapus coromandelianus*	cotton pygmy-goose		C		5
animals	birds	Anatidae	*Nettapus pulchellus*	green pygmy-goose		C		1
animals	birds	Anatidae	*Oxyura australis*	blue-billed duck		C		2
animals	birds	Anatidae	*Spatula rhynchotis*	Australasian shoveler		C		13
animals	birds	Anatidae	*Stictonetta naevosa*	freckled duck		C		4
animals	birds	Anatidae	*Tadorna tadornoides*	Australian shelduck		C		1
animals	birds	Anhingidae	*Anhinga novaehollandiae*	Australasian darter		C		163
animals	birds	Anseranatidae	*Anseranas semipalmata*	magpie goose		C		64
animals	birds	Apodidae	*Apus pacificus*	fork-tailed swift		SL		9
animals	birds	Apodidae	*Hirundapus caudacutus*	white-throated needletail		V	V	15
animals	birds	Ardeidae	*Ardea alba modesta*	eastern great egret		C		472
animals	birds	Ardeidae	*Ardea intermedia*	intermediate egret		C		221
animals	birds	Ardeidae	*Ardea pacifica*	white-necked heron		C		20
animals	birds	Ardeidae	*Botaurus poiciloptilus*	Australasian bittern		E	E	4
animals	birds	Ardeidae	*Bubulcus ibis*	cattle egret		C		246
animals	birds	Ardeidae	*Butorides striata*	striated heron		C		89
animals	birds	Ardeidae	*Egretta garzetta*	little egret		C		333
animals	birds	Ardeidae	*Egretta novaehollandiae*	white-faced heron		C		764
animals	birds	Ardeidae	*Egretta sacra*	eastern reef egret		C		8
animals	birds	Ardeidae	*Ixobrychus dubius*	Australian little bittern		C		5
animals	birds	Ardeidae	*Ixobrychus flavicollis*	black bittern		C		3
animals	birds	Ardeidae	*Nycticorax caledonicus*	nankeen night-heron		C		25
animals	birds	Artamidae	*Artamus cyanopterus*	dusky woodswallow		C		6
animals	birds	Artamidae	*Artamus leucorynchus*	white-breasted woodswallow		C		111
animals	birds	Artamidae	*Artamus personatus*	masked woodswallow		C		4
animals	birds	Artamidae	*Artamus superciliosus*	white-browed woodswallow		C		7
animals	birds	Artamidae	*Cracticus nigrogularis*	pied butcherbird		C		193
animals	birds	Artamidae	*Cracticus torquatus*	grey butcherbird		C		143
animals	birds	Artamidae	*Gymnorhina tibicen*	Australian magpie		C		284
animals	birds	Artamidae	*Strepera graculina*	pied currawong		C		20
animals	birds	Artamidae	*Strepera graculina graculina*	pied currawong (eastern Australia)		C		1
animals	birds	Burhinidae	*Burhinus grallarius*	bush stone-curlew		C		2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Burhinidae	*Esacus magnirostris*	beach stone-curlew		V		1
animals	birds	Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo		C		54
animals	birds	Cacatuidae	*Cacatua sanguinea*	little corella		C		30
animals	birds	Cacatuidae	*Cacatua tenuirostris*	long-billed corella	Y	C		3
animals	birds	Cacatuidae	*Calyptorhynchus funereus*	yellow-tailed black-cockatoo		C		2
animals	birds	Cacatuidae	*Calyptorhynchus lathami lathami*	glossy black-cockatoo (eastern)		V	V	1
animals	birds	Cacatuidae	*Eolophus roseicapilla*	galah		C		116
animals	birds	Cacatuidae	*Nymphicus hollandicus*	cockatiel		C		2
animals	birds	Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike		C		202
animals	birds	Campephagidae	*Coracina papuensis*	white-bellied cuckoo-shrike		C		9
animals	birds	Campephagidae	*Edolisoma tenuirostre*	common cicadabird		C		18
animals	birds	Campephagidae	*Lalage leucomela*	varied triller		C		47
animals	birds	Campephagidae	*Lalage tricolor*	white-winged triller		C		11
animals	birds	Charadriidae	*Charadrius bicinctus*	double-banded plover		SL		16
animals	birds	Charadriidae	*Charadrius leschenaultii*	greater sand plover		V	V	4
animals	birds	Charadriidae	*Charadrius mongolus*	lesser sand plover		E	E	18
animals	birds	Charadriidae	*Charadrius ruficapillus*	red-capped plover		C		377
animals	birds	Charadriidae	*Charadrius sp.*			C		1
animals	birds	Charadriidae	*Charadrius veredus*	oriental plover		SL		2
animals	birds	Charadriidae	*Elseyornis melanops*	black-fronted dotterel		C		97
animals	birds	Charadriidae	*Erythrogonys cinctus*	red-kneed dotterel		C		146
animals	birds	Charadriidae	*Pluvialis fulva*	Pacific golden plover		SL		112
animals	birds	Charadriidae	*Pluvialis squatarola*	grey plover		SL		3
animals	birds	Charadriidae	*Vanellus miles*	masked lapwing		C		624
animals	birds	Charadriidae	*Vanellus miles novaehollandiae*	masked lapwing (southern subspecies)		C		176
animals	birds	Charadriidae	*Vanellus tricolor*	banded lapwing		C		3
animals	birds	Ciconiidae	*Ephippiorhynchus asiaticus*	black-necked stork		C		72
animals	birds	Cisticolidae	*Cisticola exilis*	golden-headed cisticola		C		93
animals	birds	Climacteridae	*Climacteris picumnus*	brown treecreeper		C		4
animals	birds	Climacteridae	*Cormobates leucophaea*	white-throated treecreeper		C		3
animals	birds	Climacteridae	*Cormobates leucophaea metastasis*	white-throated treecreeper (southern)		C		12
animals	birds	Columbidae	*Chalcophaps longirostris*	Pacific emerald dove		C		1
animals	birds	Columbidae	*Columba leucomela*	white-headed pigeon		C		1
animals	birds	Columbidae	*Columba livia*	rock dove	Y			46
animals	birds	Columbidae	*Geopelia cuneata*	diamond dove		C		1
animals	birds	Columbidae	*Geopelia humeralis*	bar-shouldered dove		C		132
animals	birds	Columbidae	*Geopelia placida*	peaceful dove		C		72
animals	birds	Columbidae	*Lopholaimus antarcticus*	topknot pigeon		C		7
animals	birds	Columbidae	*Macropygia amboinensis*	brown cuckoo-dove		C		11
animals	birds	Columbidae	*Ocyphaps lophotes*	crested pigeon		C		179
animals	birds	Columbidae	*Phaps chalcoptera*	common bronzewing		C		8
animals	birds	Columbidae	*Ptilinopus regina*	rose-crowned fruit-dove		C		2
animals	birds	Columbidae	*Streptopelia chinensis*	spotted dove	Y			164
animals	birds	Coraciidae	*Eurystomus orientalis*	dollarbird		C		71
animals	birds	Corvidae	*Corvus orru*	Torresian crow		C		377
animals	birds	Corvidae	*Corvus sp.*			C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Cuculidae	*Cacomantis flabelliformis*	fan-tailed cuckoo		C		50
animals	birds	Cuculidae	*Cacomantis pallidus*	pallid cuckoo		C		19
animals	birds	Cuculidae	*Cacomantis variolosus*	brush cuckoo		C		22
animals	birds	Cuculidae	*Centropus phasianinus*	pheasant coucal		C		32
animals	birds	Cuculidae	*Chalcites basalis*	Horsfield's bronze-cuckoo		C		11
animals	birds	Cuculidae	*Chalcites lucidus*	shining bronze-cuckoo		C		29
animals	birds	Cuculidae	*Chalcites minutillus barnardi*	Eastern little bronze-cuckoo		C		5
animals	birds	Cuculidae	*Eudynamys orientalis*	eastern koel		C		32
animals	birds	Cuculidae	*Scythrops novaehollandiae*	channel-billed cuckoo		C		13
animals	birds	Dicruridae	*Dicrurus bracteatus*	spangled drongo		C		132
animals	birds	Dicruridae	*Dicrurus bracteatus bracteatus*	spangled drongo (eastern Australia)		C		3
animals	birds	Estrildidae	*Lonchura castaneothorax*	chestnut-breasted mannikin		C		17
animals	birds	Estrildidae	*Lonchura punctulata*	nutmeg mannikin	Y			20
animals	birds	Estrildidae	*Neochmia temporalis*	red-browed finch		C		76
animals	birds	Estrildidae	*Taeniopygia bichenovii*	double-barred finch		C		74
animals	birds	Estrildidae	*Taeniopygia guttata*	zebra finch		C		1
animals	birds	Eurostopodidae	*Eurostopodus mystacalis*	white-throated nightjar		C		17
animals	birds	Falconidae	*Falco berigora*	brown falcon		C		10
animals	birds	Falconidae	*Falco cenchroides*	nankeen kestrel		C		29
animals	birds	Falconidae	*Falco longipennis*	Australian hobby		C		26
animals	birds	Falconidae	*Falco peregrinus*	peregrine falcon		C		21
animals	birds	Falconidae	*Falco sp.*			C		1
animals	birds	Falconidae	*Falco subniger*	black falcon		C		1
animals	birds	Fringillidae	*Carduelis carduelis*	European goldfinch	Y			1
animals	birds	Gruidae	*Antigone rubicunda*	brolga		C		40
animals	birds	Haematopodidae	*Haematopus fuliginosus*	sooty oystercatcher		C		3
animals	birds	Haematopodidae	*Haematopus longirostris*	Australian pied oystercatcher		C		109
animals	birds	Halcyonidae	*Dacelo novaeguineae*	laughing kookaburra		C		170
animals	birds	Halcyonidae	*Todiramphus macleayii*	forest kingfisher		C		76
animals	birds	Halcyonidae	*Todiramphus pyrrhopygius*	red-backed kingfisher		C		1
animals	birds	Halcyonidae	*Todiramphus sanctus*	sacred kingfisher		C		166
animals	birds	Halcyonidae	*Todiramphus sordidus*	Torresian kingfisher		C		94
animals	birds	Hirundinidae	*Cheramoeca leucosterna*	white-backed swallow		C		1
animals	birds	Hirundinidae	*Hirundo neoxena*	welcome swallow		C		268
animals	birds	Hirundinidae	*Hirundo rustica*	barn swallow		SL		2
animals	birds	Hirundinidae	*Petrochelidon ariel*	fairy martin		C		72
animals	birds	Hirundinidae	*Petrochelidon nigricans*	tree martin		C		34
animals	birds	Jacanidae	*Irediparra gallinacea*	comb-crested jacana		C		45
animals	birds	Laridae	*Chlidonias hybrida*	whiskered tern		C		16
animals	birds	Laridae	*Chlidonias leucopterus*	white-winged black tern		SL		11
animals	birds	Laridae	*Chroicocephalus novaehollandiae*	silver gull		C		396/1
animals	birds	Laridae	*Gelochelidon nilotica*	gull-billed tern		SL		412
animals	birds	Laridae	*Hydroprogne caspia*	Caspian tern		SL		300
animals	birds	Laridae	*Larus dominicanus*	kelp gull		C		2
animals	birds	Laridae	*Larus pacificus*	Pacific gull		C		1
animals	birds	Laridae	*Leucophaeus pipixcan*	Franklin's gull		C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Laridae	*Sterna hirundo*	common tern		SL		10
animals	birds	Laridae	*Sternula albifrons*	little tern		SL		39
animals	birds	Laridae	*Thalasseus bengalensis*	lesser crested tern		C		5
animals	birds	Laridae	*Thalasseus bergii*	crested tern		SL		136
animals	birds	Maluridae	*Malurus cyaneus*	superb fairy-wren		C		37
animals	birds	Maluridae	*Malurus lamberti*	variegated fairy-wren		C		124
animals	birds	Maluridae	*Malurus melanocephalus*	red-backed fairy-wren		C		187
animals	birds	Maluridae	*Malurus sp.*			C		1
animals	birds	Megaluridae	*Cincloramphus cruralis*	brown songlark		C		4
animals	birds	Megaluridae	*Cincloramphus mathewsi*	rufous songlark		C		2
animals	birds	Megaluridae	*Cincloramphus timoriensis*	tawny grassbird		C		108
animals	birds	Megaluridae	*Poodytes gramineus*	little grassbird		C		21
animals	birds	Megapodiidae	*Alectura lathami*	Australian brush-turkey		C		11
animals	birds	Meliphagidae	*Acanthagenys rufogularis*	spiny-cheeked honeyeater		C		1
animals	birds	Meliphagidae	*Acanthorhynchus tenuirostris*	eastern spinebill		C		3
animals	birds	Meliphagidae	*Anthochaera chrysoptera*	little wattlebird		C		15
animals	birds	Meliphagidae	*Caligavis chrysops*	yellow-faced honeyeater		C		74
animals	birds	Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater		C		48
animals	birds	Meliphagidae	*Gavicalis fasciogularis*	mangrove honeyeater		C		124
animals	birds	Meliphagidae	*Lichenostomus melanops*	yellow-tufted honeyeater		C		1
animals	birds	Meliphagidae	*Lichmera indistincta*	brown honeyeater		C		284
animals	birds	Meliphagidae	*Manorina melanocephala*	noisy miner		C		264
animals	birds	Meliphagidae	*Meliphaga lewinii*	Lewin's honeyeater		C		100
animals	birds	Meliphagidae	*Melithreptus albogularis*	white-throated honeyeater		C		85
animals	birds	Meliphagidae	*Melithreptus gularis*	black-chinned honeyeater		C		1
animals	birds	Meliphagidae	*Melithreptus lunatus*	white-naped honeyeater		C		8
animals	birds	Meliphagidae	*Myzomela obscura*	dusky honeyeater		C		1
animals	birds	Meliphagidae	*Myzomela sanguinolenta*	scarlet honeyeater		C		101
animals	birds	Meliphagidae	*Philemon citreogularis*	little friarbird		C		47
animals	birds	Meliphagidae	*Philemon corniculatus*	noisy friarbird		C		69
animals	birds	Meliphagidae	*Phylidonyris niger*	white-cheeked honeyeater		C		7
animals	birds	Meliphagidae	*Phylidonyris novaehollandiae*	New Holland honeyeater		C		1
animals	birds	Meliphagidae	*Plectorhyncha lanceolata*	striped honeyeater		C		52
animals	birds	Meliphagidae	*Ptilotula fusca*	fuscous honeyeater		C		1
animals	birds	Meropidae	*Merops ornatus*	rainbow bee-eater		C		142
animals	birds	Monarchidae	*Carterornis leucotis*	white-eared monarch		C		1
animals	birds	Monarchidae	*Grallina cyanoleuca*	magpie-lark		C		237
animals	birds	Monarchidae	*Monarcha melanopsis*	black-faced monarch		SL		14
animals	birds	Monarchidae	*Myiagra alecto*	shining flycatcher		C		4
animals	birds	Monarchidae	*Myiagra cyanoleuca*	satin flycatcher		SL		8
animals	birds	Monarchidae	*Myiagra inquieta*	restless flycatcher		C		12
animals	birds	Monarchidae	*Myiagra rubecula*	leaden flycatcher		C		61
animals	birds	Monarchidae	*Symposiachrus trivirgatus*	spectacled monarch		SL		14
animals	birds	Motacillidae	*Anthus novaeseelandiae*	Australasian pipit		C		37
animals	birds	Nectariniidae	*Dicaeum hirundinaceum*	mistletoebird		C		100
animals	birds	Neosittidae	*Daphoenositta chrysoptera*	varied sittella		C		13

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Oceanitidae	*Fregetta tropica*	black-bellied storm-petrel		C		1
animals	birds	Oriolidae	*Oriolus sagittatus*	olive-backed oriole		C		64
animals	birds	Oriolidae	*Sphecotheres vieilloti*	Australasian figbird		C		129
animals	birds	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush		C		163
animals	birds	Pachycephalidae	*Colluricincla megarhyncha*	little shrike-thrush		C		26
animals	birds	Pachycephalidae	*Falcunculus frontatus*	crested shrike-tit		C		1
animals	birds	Pachycephalidae	*Pachycephala pectoralis*	golden whistler		C		29
animals	birds	Pachycephalidae	*Pachycephala pectoralis youngi*	golden whistler (south-eastern Australia)		C		1
animals	birds	Pachycephalidae	*Pachycephala rufiventris*	rufous whistler		C		182
animals	birds	Pardalotidae	*Pardalotus punctatus*	spotted pardalote		C		8
animals	birds	Pardalotidae	*Pardalotus striatus*	striated pardalote		C		204
animals	birds	Passeridae	*Passer domesticus*	house sparrow	Y			51
animals	birds	Pelecanidae	*Pelecanus conspicillatus*	Australian pelican		C		301
animals	birds	Petroicidae	*Eopsaltria australis*	eastern yellow robin		C		30
animals	birds	Petroicidae	*Microeca fascinans*	jacky winter		C		9
animals	birds	Petroicidae	*Petroica rosea*	rose robin		C		10
animals	birds	Phalacrocoracidae	*Microcarbo melanoleucos*	little pied cormorant		C		253
animals	birds	Phalacrocoracidae	*Phalacrocorax carbo*	great cormorant		C		20
animals	birds	Phalacrocoracidae	*Phalacrocorax sp.*			C		2
animals	birds	Phalacrocoracidae	*Phalacrocorax sulcirostris*	little black cormorant		C		200
animals	birds	Phalacrocoracidae	*Phalacrocorax varius*	pied cormorant		C		96
animals	birds	Phasianidae	*Coturnix pectoralis*	stubble quail		C		1
animals	birds	Phasianidae	*Synoicus chinensis*	king quail		C		3
animals	birds	Phasianidae	*Synoicus ypsilophorus*	brown quail		C		25
animals	birds	Podargidae	*Podargus strigoides*	tawny frogmouth		C		67
animals	birds	Podicipedidae	*Podiceps cristatus*	great crested grebe		C		2
animals	birds	Podicipedidae	*Poliocephalus poliocephalus*	hoary-headed grebe		C		2
animals	birds	Podicipedidae	*Tachybaptus novaehollandiae*	Australasian grebe		C		122
animals	birds	Pomatostomidae	*Pomatostomus temporalis*	grey-crowned babbler		C		2
animals	birds	Procellariidae	*Ardenna pacifica*	wedge-tailed shearwater		V		2
animals	birds	Procellariidae	*Ardenna tenuirostris*	short-tailed shearwater		SL		6/4
animals	birds	Psittacidae	*Alisterus scapularis*	Australian king-parrot		C		5
animals	birds	Psittacidae	*Glossopsitta concinna*	musk lorikeet		C		3
animals	birds	Psittacidae	*Parvipsitta pusilla*	little lorikeet		C		6
animals	birds	Psittacidae	*Platycercus adscitus*	pale-headed rosella		C		169
animals	birds	Psittacidae	*Platycercus adscitus palliceps*	pale-headed rosella (southern form)		C		3
animals	birds	Psittacidae	*Platycercus elegans*	crimson rosella		C		2
animals	birds	Psittacidae	*Platycercus eximius*	eastern rosella		C		8
animals	birds	Psittacidae	*Psephotus haematonotus*	red-rumped parrot		C		3
animals	birds	Psittacidae	*Trichoglossus chlorolepidotus*	scaly-breasted lorikeet		C		146
animals	birds	Psittacidae	*Trichoglossus moluccanus*	rainbow lorikeet		C		283
animals	birds	Psophodidae	*Psophodes olivaceus*	eastern whipbird		C		54
animals	birds	Ptilonorhynchidae	*Ptilonorhynchus violaceus*	satin bowerbird		C		1
animals	birds	Rallidae	*Amaurornis moluccana*	pale-vented bush-hen		C		5
animals	birds	Rallidae	*Fulica atra*	Eurasian coot		C		85

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Rallidae	*Gallinula tenebrosa*	dusky moorhen		C		149
animals	birds	Rallidae	*Gallirallus philippensis*	buff-banded rail		C		31
animals	birds	Rallidae	*Lewinia pectoralis*	Lewin's rail		C		4
animals	birds	Rallidae	*Porphyrio melanotus*	purple swamphen		C		187
animals	birds	Rallidae	*Porzana fluminea*	Australian spotted crake		C		2
animals	birds	Rallidae	*Zapornia pusilla*	Baillon's crake		C		10
animals	birds	Rallidae	*Zapornia tabuensis*	spotless crake		C		7
animals	birds	Recurvirostridae	*Himantopus himantopus*	black-winged stilt		C		682
animals	birds	Recurvirostridae	*Recurvirostra novaehollandiae*	red-necked avocet		C		68
animals	birds	Rhipiduridae	*Rhipidura albiscapa*	grey fantail		C		201
animals	birds	Rhipiduridae	*Rhipidura leucophrys*	willie wagtail		C		229
animals	birds	Rhipiduridae	*Rhipidura leucophrys leucophrys*	willie wagtail (southern)		C		1
animals	birds	Rhipiduridae	*Rhipidura rufifrons*	rufous fantail		SL		37
animals	birds	Rostratulidae	*Rostratula australis*	Australian painted-snipe		E	E	3
animals	birds	Scolopacidae	*Actitis hypoleucos*	common sandpiper		SL		23
animals	birds	Scolopacidae	*Arenaria interpres*	ruddy turnstone		SL		23
animals	birds	Scolopacidae	*Calidris acuminata*	sharp-tailed sandpiper		SL		375
animals	birds	Scolopacidae	*Calidris alba*	sanderling		SL		6
animals	birds	Scolopacidae	*Calidris canutus*	red knot		E	E	105
animals	birds	Scolopacidae	*Calidris falcinellus*	broad-billed sandpiper		SL		10
animals	birds	Scolopacidae	*Calidris ferruginea*	curlew sandpiper		CR	CE	215
animals	birds	Scolopacidae	*Calidris melanotos*	pectoral sandpiper		SL		6
animals	birds	Scolopacidae	*Calidris pugnax*	ruff		SL		1
animals	birds	Scolopacidae	*Calidris ruficollis*	red-necked stint		SL		207
animals	birds	Scolopacidae	*Calidris sp.*			C		2
animals	birds	Scolopacidae	*Calidris tenuirostris*	great knot		CR	CE	195
animals	birds	Scolopacidae	*Gallinago hardwickii*	Latham's snipe		SL		34
animals	birds	Scolopacidae	*Gallinago sp.*			C		4
animals	birds	Scolopacidae	*Limnodromus semipalmatus*	Asian dowitcher		SL		5
animals	birds	Scolopacidae	*Limosa lapponica baueri*	Western Alaskan bar-tailed godwit		V	V	532
animals	birds	Scolopacidae	*Limosa limosa*	black-tailed godwit		SL		299
animals	birds	Scolopacidae	*Numenius madagascariensis*	eastern curlew		E	CE	523
animals	birds	Scolopacidae	*Numenius minutus*	little curlew		SL		3
animals	birds	Scolopacidae	*Numenius phaeopus*	whimbrel		SL		583
animals	birds	Scolopacidae	*Tringa brevipes*	grey-tailed tattler		SL		33
animals	birds	Scolopacidae	*Tringa glareola*	wood sandpiper		SL		10
animals	birds	Scolopacidae	*Tringa incana*	wandering tattler		SL		1
animals	birds	Scolopacidae	*Tringa nebularia*	common greenshank		SL		399
animals	birds	Scolopacidae	*Tringa sp.*			C		2
animals	birds	Scolopacidae	*Tringa stagnatilis*	marsh sandpiper		SL		247
animals	birds	Scolopacidae	*Xenus cinereus*	terek sandpiper		SL		15
animals	birds	Stercorariidae	*Stercorarius parasiticus*	Arctic jaeger		SL		2
animals	birds	Stercorariidae	*Stercorarius pomarinus*	pomarine jaeger		SL		2
animals	birds	Strigidae	*Ninox boobook*	southern boobook		C		24
animals	birds	Strigidae	*Ninox strenua*	powerful owl		V		2
animals	birds	Sturnidae	*Acridotheres tristis*	common myna	Y			50

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animals	birds	Sturnidae	*Sturnus vulgaris*	common starling	Y			82
animals	birds	Sulidae	*Morus serrator*	Australasian gannet		C		2
animals	birds	Threskiornithidae	*Platalea flavipes*	yellow-billed spoonbill		C		12
animals	birds	Threskiornithidae	*Platalea regia*	royal spoonbill		C		281
animals	birds	Threskiornithidae	*Plegadis falcinellus*	glossy ibis		SL		63
animals	birds	Threskiornithidae	*Threskiornis molucca*	Australian white ibis		C		913
animals	birds	Threskiornithidae	*Threskiornis spinicollis*	straw-necked ibis		C		295
animals	birds	Timaliidae	*Zosterops lateralis*	silvereye		C		255
animals	birds	Timaliidae	*Zosterops lateralis cornwalli*	silvereye (eastern)		C		2
animals	birds	Turnicidae	*Turnix varius*	painted button-quail		C		6
animals	birds	Tytonidae	*Tyto javanica*	eastern barn owl		C		6
animals	insects	Aeshnidae	*Anax papuensis*	Australian Emperor				1
animals	insects	Hesperiidae	*Suniana sunias*					1
animals	insects	Libellulidae	*Rhyothemis phyllis chloe*	yellow-striped flutterer				1
animals	insects	Libellulidae	*Tramea loewii*	common glider				1
animals	insects	Lycaenidae	*Acrodipsas illidgei*	Illidge's ant-blue		V		2
animals	insects	Lycaenidae	*Ogyris amaryllis amaryllis*	satin azure (Bassian subspecies)				1
animals	insects	Lycaenidae	*Theclinesthes serpentatus serpentatus*	salt-bush blue				2
animals	insects	Lycaenidae	*Zizina otis labradus*	common grass-blue (Australian subspecies)				1
animals	insects	Nymphalidae	*Acraea andromacha andromacha*	glasswing				1
animals	insects	Nymphalidae	*Charaxes sempronius sempronius*	tailed emperor				1
animals	insects	Nymphalidae	*Cupha prosope prosope*	bordered rustic (Australian subspecies)				1
animals	insects	Nymphalidae	*Danaus affinis affinis*	swamp tiger				2
animals	insects	Nymphalidae	*Danaus petilia*	lesser wanderer				5
animals	insects	Nymphalidae	*Danaus plexippus*	monarch	Y			6
animals	insects	Nymphalidae	*Euploea corinna*	common crow				8
animals	insects	Nymphalidae	*Euploea tulliolus tulliolus*	purple crow				2
animals	insects	Nymphalidae	*Hypolimnas bolina nerina*	varied eggfly				7
animals	insects	Nymphalidae	*Melanitis leda bankia*	evening brown				7
animals	insects	Nymphalidae	*Phaedyma shepherdi shepherdi*	white-banded plane (southern subspecies)				1
animals	insects	Nymphalidae	*Tirumala hamata hamata*	blue tiger				8
animals	insects	Nymphalidae	*Vanessa kershawi*	Australian painted lady				1
animals	insects	Papilionidae	*Cressida cressida cressida*	clearwing swallowtail				2
animals	insects	Papilionidae	*Graphium choredon*	blue triangle				5
animals	insects	Papilionidae	*Papilio aegeus*					3
animals	insects	Papilionidae	*Papilio aegeus aegeus*	orchard swallowtail (Australian subspecies)				5
animals	insects	Papilionidae	*Papilio anactus*	dainty swallowtail				1
animals	insects	Papilionidae	*Papilio fuscus*					1
animals	insects	Papilionidae	*Papilio fuscus capaneus*	fuscous swallowtail (Australian subspecies)				1
animals	insects	Pieridae	*Appias paulina ega*	yellow albatross				2
animals	insects	Pieridae	*Belenois java teutonia*	caper white				1

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animals	insects	Pieridae	*Delias argenthona argenthona*	scarlet jezebel				1
animals	insects	Pieridae	*Pieris rapae*	cabbage white	Y			2
animals	mammals	Acrobatidae	*Acrobates pygmaeus*	feathertail glider		C		1
animals	mammals	Bovidae	*Bos taurus*	European cattle	Y			1
animals	mammals	Canidae	*Canis familiaris*	dog	Y			3
animals	mammals	Canidae	*Canis familiaris (dingo)*	dingo				1
animals	mammals	Canidae	*Vulpes vulpes*	red fox	Y			31
animals	mammals	Dasyuridae	*Antechinus flavipes flavipes*	yellow-footed antechinus (south-east Queensland)		C		5
animals	mammals	Dasyuridae	*Antechinus flavipes sensu lato*	yellow-footed antechinus		C		2
animals	mammals	Dasyuridae	*Dasyurus maculatus maculatus*	spotted-tailed quoll (southern subspecies)		E	E	1
animals	mammals	Delphinidae	*Tursiops aduncus*	Indo-Pacific bottlenose dolphin		C		2
animals	mammals	Emballonuridae	*Saccolaimus flaviventris*	yellow-bellied sheathtail bat		C		1
animals	mammals	Felidae	*Felis catus*	cat	Y			9
animals	mammals	Kogiidae	*Kogia breviceps*	pygmy sperm whale		C		1
animals	mammals	Leporidae	*Lepus europaeus*	European brown hare	Y			18
animals	mammals	Macropodidae	*Macropus giganteus*	eastern grey kangaroo		C		52
animals	mammals	Macropodidae	*Notamacropus rufogriseus*	red-necked wallaby		C		2
animals	mammals	Macropodidae	*Wallabia bicolor*	swamp wallaby		C		26
animals	mammals	Miniopteridae	*Miniopterus australis*	little bent-wing bat		C		2
animals	mammals	Molossidae	*Austronomus australis*	white-striped freetail bat		C		4
animals	mammals	Molossidae	*Mormopterus lumsdenae*	northern free-tailed bat		C		1
animals	mammals	Molossidae	*Mormopterus norfolkensis*	east coast freetail bat		C		1
animals	mammals	Molossidae	*Mormopterus ridei*	eastern free-tailed bat		C		2
animals	mammals	Muridae	*Hydromys chrysogaster*	water rat		C		1
animals	mammals	Muridae	*Melomys burtoni*	grassland melomys		C		1
animals	mammals	Muridae	*Mus musculus*	house mouse	Y			8
animals	mammals	Muridae	*Rattus fuscipes*	bush rat		C		4
animals	mammals	Muridae	*Rattus lutreolus*	swamp rat		C		4
animals	mammals	Muridae	*Rattus rattus*	black rat	Y			5
animals	mammals	Ornithorhynchidae	*Ornithorhynchus anatinus*	platypus		SL		2
animals	mammals	Peramelidae	*Isoodon macrourus*	northern brown bandicoot		C		4
animals	mammals	Peramelidae	*Perameles nasuta*	long-nosed bandicoot		C		2
animals	mammals	Petauridae	*Petaurus breviceps*	sugar glider		C		4
animals	mammals	Petauridae	*Petaurus breviceps sensu lato*	sugar glider		C		3
animals	mammals	Petauridae	*Petaurus norfolcensis*	squirrel glider		C		11
animals	mammals	Phalangeridae	*Trichosurus vulpecula*	common brushtail possum		C		45
animals	mammals	Phascolarctidae	*Phascolarctos cinereus*	koala		E	E	3121
animals	mammals	Pseudocheiridae	*Pseudocheirus peregrinus*	common ringtail possum		C		6
animals	mammals	Pteropodidae	*Pteropus alecto*	black flying-fox		C		22
animals	mammals	Pteropodidae	*Pteropus poliocephalus*	grey-headed flying-fox		C	V	5
animals	mammals	Pteropodidae	*Pteropus scapulatus*	little red flying-fox		C		10
animals	mammals	Pteropodidae	*Pteropus sp.*			C		2
animals	mammals	Suidae	*Sus scrofa*	pig	Y			1
animals	mammals	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna		SL		3

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animals	mammals	Vespertilionidae	*Chalinolobus gouldii*	Gould's wattled bat		C		2
animals	mammals	Vespertilionidae	*Chalinolobus morio*	chocolate wattled bat		C		1
animals	mammals	Vespertilionidae	*Nyctophilus bifax*	northern long-eared bat		C		1
animals	mammals	Vespertilionidae	*Scotorepens greyii*	little broad-nosed bat		C		1
animals	ray-finned fishes	Ambassidae	*Ambassis marianus*	estuary glassfish				1
animals	ray-finned fishes	Anguillidae	*Anguilla reinhardtii*	longfin eel				9
animals	ray-finned fishes	Mugilidae	*Mugil cephalus*	sea mullet				1
animals	ray-finned fishes	Plotosidae	*Porochilus rendahli*	Rendahl's catfish				2
animals	ray-finned fishes	Poeciliidae	*Gambusia holbrooki*	mosquitofish	Y			3
animals	ray-finned fishes	Poeciliidae	*Xiphophorus maculatus*	platy	Y			1
animals	ray-finned fishes	Terapontidae	*Leiopotherapon unicolor*	spangled perch				1
animals	reptiles	Agamidae	*Chlamydosaurus kingii*	frilled lizard		C		1/1
animals	reptiles	Agamidae	*Diporiphora australis*	tommy roundhead		C		1
animals	reptiles	Agamidae	*Diporiphora nobbi*	nobbi		C		1
animals	reptiles	Agamidae	*Intellagama lesueurii*	eastern water dragon		C		39
animals	reptiles	Agamidae	*Pogona barbata*	bearded dragon		C		29/1
animals	reptiles	Boidae	*Antaresia maculosa*	spotted python		C		1
animals	reptiles	Boidae	*Morelia spilota*	carpet python		C		22
animals	reptiles	Chelidae	*Chelodina expansa*	broad-shelled river turtle		C		2
animals	reptiles	Chelidae	*Chelodina longicollis*	eastern snake-necked turtle		C		6/1
animals	reptiles	Chelidae	*Emydura macquarii macquarii*	Murray turtle		C		4
animals	reptiles	Chelidae	*Wollumbinia latisternum*	saw-shelled turtle		C		1
animals	reptiles	Colubridae	*Boiga irregularis*	brown tree snake		C		1
animals	reptiles	Colubridae	*Dendrelaphis punctulatus*	green tree snake		C		17
animals	reptiles	Colubridae	*Tropidonophis mairii*	freshwater snake		C		10
animals	reptiles	Diplodactylidae	*Nebulifera robusta*	robust velvet gecko		C		1/1
animals	reptiles	Elapidae	*Cacophis harriettae*	white-crowned snake		C		5/2
animals	reptiles	Elapidae	*Cryptophis nigrescens*	eastern small-eyed snake		C		1
animals	reptiles	Elapidae	*Demansia psammophis*	yellow-faced whipsnake		C		11
animals	reptiles	Elapidae	*Hemiaspis signata*	black-bellied swamp snake		C		2
animals	reptiles	Elapidae	*Pseudonaja sp.*			C		2
animals	reptiles	Elapidae	*Pseudonaja textilis*	eastern brown snake		C		4/1
animals	reptiles	Elapidae	*Tropidechis carinatus*	rough-scaled snake		C		4
animals	reptiles	Elapidae	*Vermicella annulata*	bandy-bandy		C		3/3
animals	reptiles	Emydidae	*Trachemys scripta elegans*	red-eared slider	Y			1
animals	reptiles	Gekkonidae	*Hemidactylus frenatus*	house gecko	Y			3
animals	reptiles	Pygopodidae	*Delma plebeia*	common delma		C		5
animals	reptiles	Pygopodidae	*Delma sp.*			C		1
animals	reptiles	Pygopodidae	*Lialis burtonis*	Burton's legless lizard		C		2/1
animals	reptiles	Scincidae	*Anomalopus verreauxii*	three-clawed worm-skink		C		3/2
animals	reptiles	Scincidae	*Calyptotis scutirostrum*	scute-snouted calyptotis		C		8
animals	reptiles	Scincidae	*Carlia sp.*			C		1
animals	reptiles	Scincidae	*Concinnia tenuis*	bar-sided skink		C		1
animals	reptiles	Scincidae	*Cryptoblepharus pulcher pulcher*	elegant snake-eyed skink		C		21
animals	reptiles	Scincidae	*Ctenotus taeniolatus*	copper-tailed skink		C		2
animals	reptiles	Scincidae	*Eulamprus quoyii*	eastern water skink		C		1

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animals	reptiles	Scincidae	*Eulamprus sp.*			C		4
animals	reptiles	Scincidae	*Lampropholis delicata*	dark-flecked garden sunskink		C		29
animals	reptiles	Scincidae	*Lampropholis guichenoti*	pale-flecked garden sunskink		C		1
animals	reptiles	Scincidae	*Lygisaurus foliorum*	tree-base litter-skink		C		3
animals	reptiles	Scincidae	*Morethia taeniopleura*	fire-tailed skink		C		2
animals	reptiles	Scincidae	*Tiliqua scincoides*	eastern blue-tongued lizard		C		14
animals	reptiles	Typhlopidae	*Anilios wiedii*	brown-snouted blind snake		C		2/1
animals	reptiles	Varanidae	*Varanus varius*	lace monitor		C		3
animals	uncertain	Indeterminate	*Indeterminate*	Unknown or Code Pending				48
bacteria	blue-green algae	Entophysalidaceae	*Chlorogloea endophytica*			C		1/1
bacteria	blue-green algae	Entophysalidaceae	*Entophysalis conferta*			C		1/1
bacteria	blue-green algae	Entophysalidaceae	*Entophysalis deusta*			C		1/1
bacteria	blue-green algae	Microcystaceae	*Anacystis montana*			C		1/1
bacteria	blue-green algae	Oscillatoriaceae	*Phormidium submembranaceum*			C		1/1
chromists	brown algae	Ectocarpaceae	*Ectocarpus siliculosus*			C		1/1
fungi	Agaricomycetes	Agaricaceae	*Agaricus augustus*			C		1/1
fungi	Agaricomycetes	Agaricaceae	*Bovista aspera*			C		1/1
fungi	Agaricomycetes	Agaricaceae	*Cyathus stercoreus*			C		1/1
fungi	Agaricomycetes	Agaricaceae	*Cystolepiota*					1/1
fungi	Agaricomycetes	Agaricaceae	*Leucoagaricus fimetarius*			C		1/1
fungi	Agaricomycetes	Agaricaceae	*Leucoagaricus rubrotinctus*			C		1/1
fungi	Agaricomycetes	Hydnangiaceae	*Laccaria*					1/1
fungi	Agaricomycetes	Marasmiaceae	*Marasmius*					2/2
fungi	Agaricomycetes	Omphalotaceae	*Omphalotus nidiformis*			C		1/1
fungi	Agaricomycetes	Phanerochaetaceae	*Oxychaete cervinogilva*			C		1/1
fungi	Agaricomycetes	Russulaceae	*Russula iterika*			C		1/1
fungi	arthoniomycetes	Arthoniaceae	*Arthonia*					2/2
fungi	arthoniomycetes	Opegraphaceae	*Opegrapha*					1/1
fungi	dothideomycetes	Monoblastiaceae	*Anisomeridium tamarindi*			C		1/1
fungi	eurotiomycetes	Sphinctrinaceae	*Stenocybe*					4/4
fungi	lecanoromycetes	Caliciaceae	*Amandinea efflorescens*			C		1/1
fungi	lecanoromycetes	Caliciaceae	*Amandinea punctata*			C		3/3
fungi	lecanoromycetes	Caliciaceae	*Buellia*					1/1
fungi	lecanoromycetes	Caliciaceae	*Buellia curatellae*			C		3/3
fungi	lecanoromycetes	Caliciaceae	*Buellia demutans*			C		1/1
fungi	lecanoromycetes	Caliciaceae	*Buellia dissa*			C		7/7
fungi	lecanoromycetes	Caliciaceae	*Cratiria verdonii*			C		1/1
fungi	lecanoromycetes	Caliciaceae	*Dirinaria aegialita*			C		3/3
fungi	lecanoromycetes	Caliciaceae	*Dirinaria applanata*			C		14/14
fungi	lecanoromycetes	Caliciaceae	*Dirinaria confluens*			C		2/2
fungi	lecanoromycetes	Caliciaceae	*Dirinaria picta*			C		3/3
fungi	lecanoromycetes	Caliciaceae	*Dirinaria sekikaica*			C		9/9
fungi	lecanoromycetes	Caliciaceae	*Pyxine cocoes*			C		2/2
fungi	lecanoromycetes	Caliciaceae	*Pyxine petricola*			C		1/1
fungi	lecanoromycetes	Caliciaceae	*Pyxine subcinerea*			C		5/5
fungi	lecanoromycetes	Candelariaceae	*Candelaria concolor*			C		2/2

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fungi	lecanoromycetes	Cladoniaceae	*Thysanothecium scutellatum*			C		1/1
fungi	lecanoromycetes	Coccocarpiaceae	*Coccocarpia erythroxyli*			C		2/2
fungi	lecanoromycetes	Graphidaceae	*Graphis desquamescens*			C		2/2
fungi	lecanoromycetes	Graphidaceae	*Halegrapha mucronata*			C		1/1
fungi	lecanoromycetes	Lecanoraceae	*Lecanora*					1/1
fungi	lecanoromycetes	Lecanoraceae	*Lecanora argentata*			C		2/2
fungi	lecanoromycetes	Lecanoraceae	*Lecanora caesiorubella*			C		2/2
fungi	lecanoromycetes	Lecanoraceae	*Lecanora helva*			C		5/5
fungi	lecanoromycetes	Ochrolechiaceae	*Ochrolechia subpallescens*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Austroparmelina conlabrosa*			C		2/2
fungi	lecanoromycetes	Parmeliaceae	*Bulbothrix apophysata*			C		3/3
fungi	lecanoromycetes	Parmeliaceae	*Bulbothrix goebelii*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Bulbothrix tabacina*			C		2/2
fungi	lecanoromycetes	Parmeliaceae	*Canoparmelia aptata*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Hypotrachyna immaculata*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Notoparmelia pseudotenuirima*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Parmotrema austrocetratum*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Parmotrema crinitum*			C		5/5
fungi	lecanoromycetes	Parmeliaceae	*Parmotrema norsticticatum*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Parmotrema parahypotropum*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Parmotrema perlatum*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Parmotrema poolii*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Parmotrema rampoddense*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Parmotrema reticulatum*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Parmotrema robustum*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Parmotrema tinctorum*			C		12/12
fungi	lecanoromycetes	Parmeliaceae	*Punctelia borreri*			C		1/1
fungi	lecanoromycetes	Parmeliaceae	*Punctelia pseudocoralloidea*			C		1/1
fungi	lecanoromycetes	Pertusariaceae	*Pertusaria*					2/2
fungi	lecanoromycetes	Pertusariaceae	*Pertusaria irregularis*			C		2/2
fungi	lecanoromycetes	Pertusariaceae	*Pertusaria thiospoda*			C		1/1
fungi	lecanoromycetes	Pertusariaceae	*Pertusaria undulata*			C		1/1
fungi	lecanoromycetes	Physciaceae	*Heterodermia obscurata*			C		1/1
fungi	lecanoromycetes	Physciaceae	*Heterodermia speciosa*			C		3/3
fungi	lecanoromycetes	Physciaceae	*Heterodermia tremulans*			C		1/1
fungi	lecanoromycetes	Physciaceae	*Hyperphyscia adglutinata*			C		1/1
fungi	lecanoromycetes	Physciaceae	*Phaeophyscia hispidula*			C		2/2
fungi	lecanoromycetes	Physciaceae	*Physcia*					2/2
fungi	lecanoromycetes	Physciaceae	*Physcia minor*			C		7/7
fungi	lecanoromycetes	Physciaceae	*Physcia poncinsii*			C		1/1
fungi	lecanoromycetes	Physciaceae	*Physcia tribacoides*			C		4/4
fungi	lecanoromycetes	Pilocarpaceae	*Micarea prasina*			C		1/1
fungi	lecanoromycetes	Ramalinaceae	*Bacidia subproposita*			C		1/1
fungi	lecanoromycetes	Ramalinaceae	*Ramalina*					1/1
fungi	lecanoromycetes	Ramalinaceae	*Ramalina confirmata*			C		1/1
fungi	lecanoromycetes	Teloschistaceae	*Caloplaca rubens*			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
fungi	lecanoromycetes	Thelenellaceae	*Julella lactea*			C		1/1
plants	Bangiophyceae	Bangiaceae	*Bangia atropurpurea*			C		1/1
plants	Conjugatophyceae	Desmidiaceae	*Hyalotheca*					1/1
plants	Florideophyceae	Caulacanthaceae	*Catenella*					1/1
plants	Florideophyceae	Caulacanthaceae	*Catenella nipae*			C		1/1
plants	Florideophyceae	Cystocloniaceae	*Hypnea*					1/1
plants	Florideophyceae	Delesseriaceae	*Caloglossa leprieurii*			C		1/1
plants	Florideophyceae	Delesseriaceae	*Caloglossa ogasawaraensis*			C		1/1
plants	Florideophyceae	Delesseriaceae	*Hypoglossum*					1/1
plants	Florideophyceae	Gracilariaceae	*Gracilaria verrucosa*			C		2/2
plants	Florideophyceae	Rhodomelaceae	*Bostrychia flagellifera*			C		2/2
plants	Florideophyceae	Rhodomelaceae	*Bostrychia kelanensis*			C		3/3
plants	Florideophyceae	Rhodomelaceae	*Bostrychia moritziana*			C		2/2
plants	Florideophyceae	Rhodomelaceae	*Bostrychia radicans*			C		3/3
plants	Florideophyceae	Rhodomelaceae	*Bostrychia simpliciuscula*			C		3/3
plants	Florideophyceae	Rhodomelaceae	*Herposiphonia secunda*			C		1/1
plants	Florideophyceae	Rhodomelaceae	*Polysiphonia atlantica*			C		4/4
plants	Trebouxiophyceae	Chlorellaceae	*Apatococcus lobatus*			C		1/1
plants	Ulvophyceae	Caulerpaceae	*Caulerpa fastigiata*			C		2/2
plants	Ulvophyceae	Cladophoraceae	*Cladophora*					1/1
plants	Ulvophyceae	Cladophoraceae	*Cladophora socialis*			C		1/1
plants	Ulvophyceae	Cladophoraceae	*Rhizoclonium implexum*			C		1/1
plants	Ulvophyceae	Cladophoraceae	*Rhizoclonium riparium*			C		3/3
plants	Ulvophyceae	Cladophoraceae	*Rhizoclonium tortuosum*			C		1/1
plants	Ulvophyceae	Kornmanniaceae	*Blidingia minima*			C		3/3
plants	Ulvophyceae	Kornmanniaceae	*Pseudendoclonium submarinum*			C		2/2
plants	Ulvophyceae	Pithophoraceae	*Cladophorella calcicola*			C		1/1
plants	Ulvophyceae	Trentepohliaceae	*Trentepohlia abietina*			C		1/1
plants	Ulvophyceae	Trentepohliaceae	*Trentepohlia abietina forma crassisepta*			C		1/1
plants	Ulvophyceae	Trentepohliaceae	*Trentepohlia odorata*			C		1/1
plants	Ulvophyceae	Trentepohliaceae	*Trentepohlia peruana*			C		1/1
plants	Ulvophyceae	Trentepohliaceae	*Trentepohlia rigidula*			C		1/1
plants	Ulvophyceae	Udoteaceae	*Boodleopsis pusilla*			C		3/3
plants	Ulvophyceae	Ulvaceae	*Enteromorpha clathrata*			C		1/1
plants	Ulvophyceae	Ulvaceae	*Ulva flexuosa subsp. flexuosa*			C		1/1
plants	Ulvophyceae	Ulvaceae	*Ulva flexuosa subsp. paradoxa*			C		1/1
plants	Ulvophyceae	Ulvaceae	*Ulva lactuca*			C		3/3
plants	Ulvophyceae	Ulvaceae	*Ulva ralfsii*			C		1/1
plants	Ulvophyceae	Ulvaceae	*Ulvaria oxysperma*			C		1/1
plants	land plants	Acanthaceae	*Brunoniella australis*	blue trumpet		C		1/1
plants	land plants	Acanthaceae	*Rostellularia adscendens var. adscendens*			C		1/1
plants	land plants	Acanthaceae	*Rostellularia obtusa*			C		1/1
plants	land plants	Aizoaceae	*Carpobrotus glaucescens*	pigface		C		1/1
plants	land plants	Aizoaceae	*Sesuvium portulacastrum*	sea purslane		C		2/2
plants	land plants	Alismataceae	*Sagittaria platyphylla*	sagittaria	Y			1/1
plants	land plants	Amaranthaceae	*Guilleminea densa*	small matweed	Y			1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Anacardiaceae	*Schinus terebinthifolius*		Y			4/2
plants	land plants	Apocynaceae	*Parsonsia straminea*	monkey rope		C		1/1
plants	land plants	Araceae	*Lemna aequinoctialis*	common duckweed		C		1/1
plants	land plants	Asteraceae	*Baccharis halimifolia*	groundsel bush	Y			11/2
plants	land plants	Asteraceae	*Crassocephalum crepidioides*	thickhead	Y			1/1
plants	land plants	Asteraceae	*Eclipta prostrata*	white eclipta	Y			1/1
plants	land plants	Asteraceae	*Enydra woollsii*			C		1/1
plants	land plants	Asteraceae	*Erechtites valerianifolius*		Y			1/1
plants	land plants	Asteraceae	*Senecio madagascariensis*	fireweed	Y			5
plants	land plants	Asteraceae	*Sphaeromorphaea australis*			C		1/1
plants	land plants	Asteraceae	*Sphagneticola trilobata*		Y			1
plants	land plants	Asteraceae	*Tridax procumbens*	tridax daisy	Y			1/1
plants	land plants	Blechnaceae	*Telmatoblechnum indicum*			SL		1/1
plants	land plants	Cabombaceae	*Cabomba caroliniana var. caroliniana*	cabomba	Y			2/2
plants	land plants	Campanulaceae	*Wahlenbergia gracilis*	sprawling bluebell		SL		1/1
plants	land plants	Caryophyllaceae	*Spergularia marina*			C		2/2
plants	land plants	Casuarinaceae	*Casuarina glauca*	swamp she-oak		C		2/2
plants	land plants	Chenopodiaceae	*Einadia hastata*			C		1/1
plants	land plants	Chenopodiaceae	*Suaeda arbusculoides*			C		1/1
plants	land plants	Chenopodiaceae	*Suaeda australis*			C		1/1
plants	land plants	Chenopodiaceae	*Tecticornia indica subsp. leiostachya*			C		1/1
plants	land plants	Chenopodiaceae	*Tecticornia pergranulata subsp. queenslandica*			C		2/2
plants	land plants	Commelinaceae	*Commelina benghalensis*		Y			1/1
plants	land plants	Commelinaceae	*Commelina diffusa*	wandering jew		C		1/1
plants	land plants	Convolvulaceae	*Ipomoea alba*	moon flower	Y			1/1
plants	land plants	Convolvulaceae	*Polymeria calycina*	pink bindweed		C		1/1
plants	land plants	Crassulaceae	*Bryophyllum delagoense*		Y			1
plants	land plants	Cucurbitaceae	*Momordica charantia*	balsam pear	Y			1/1
plants	land plants	Cyperaceae	*Bolboschoenus caldwellii*			C		1/1
plants	land plants	Cyperaceae	*Bolboschoenus fluviatilis*			C		1/1
plants	land plants	Cyperaceae	*Carex appressa*			C		1/1
plants	land plants	Cyperaceae	*Chorizandra cymbaria*			C		1/1
plants	land plants	Cyperaceae	*Cyperus brevifolius*	Mullumbimby couch	Y			1/1
plants	land plants	Cyperaceae	*Cyperus haspan subsp. haspan*			C		1/1
plants	land plants	Cyperaceae	*Cyperus rotundus*	nutgrass	Y			1/1
plants	land plants	Cyperaceae	*Eleocharis dulcis*			C		1/1
plants	land plants	Cyperaceae	*Fimbristylis ferruginea*			C		2/2
plants	land plants	Cyperaceae	*Fimbristylis polytrichoides*			C		1/1
plants	land plants	Cyperaceae	*Fuirena ciliaris*			C		1/1
plants	land plants	Cyperaceae	*Fuirena umbellata*			C		1/1
plants	land plants	Cyperaceae	*Gahnia aspera*			C		1/1
plants	land plants	Cyperaceae	*Gahnia sieberiana*	sword grass		C		1/1
plants	land plants	Cyperaceae	*Machaerina articulata*			C		1/1
plants	land plants	Cyperaceae	*Machaerina teretifolia*			C		1/1
plants	land plants	Cyperaceae	*Ptilothrix deusta*			C		1/1
plants	land plants	Cyperaceae	*Schoenoplectus subulatus*			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Cyperaceae	*Schoenus apogon var. apogon*			C		2/2
plants	land plants	Cyperaceae	*Schoenus brevifolius*			C		1/1
plants	land plants	Cyperaceae	*Scleria rugosa*			C		1/1
plants	land plants	Dicranaceae	*Sclerodontium clavinerve*			C		1/1
plants	land plants	Elaeocarpaceae	*Elaeocarpus reticulatus*	ash quandong		C		1/1
plants	land plants	Euphorbiaceae	*Euphorbia dallachyana*			C		1/1
plants	land plants	Euphorbiaceae	*Euphorbia hyssopifolia*		Y			1/1
plants	land plants	Euphorbiaceae	*Euphorbia ophthalmica*		Y			1/1
plants	land plants	Euphorbiaceae	*Euphorbia serpens*		Y			1/1
plants	land plants	Goodeniaceae	*Goodenia paniculata*			C		1/1
plants	land plants	Haloragaceae	*Gonocarpus chinensis subsp. verrucosus*			C		1/1
plants	land plants	Haloragaceae	*Myriophyllum aquaticum*	Brazilian water milfoil	Y			1/1
plants	land plants	Hemerocallidaceae	*Dianella caerulea*			C		1/1
plants	land plants	Hydrocharitaceae	*Vallisneria nana*			SL		2/2
plants	land plants	Hypnodendraceae	*Bescherellia elegantissima*			C		1/1
plants	land plants	Juncaceae	*Juncus acutus subsp. acutus*		Y			1/1
plants	land plants	Juncaceae	*Juncus continuus*			C		2/2
plants	land plants	Juncaceae	*Juncus polyanthemus*			C		1/1
plants	land plants	Juncaginaceae	*Cycnogeton multifructus*			SL		1/1
plants	land plants	Leguminosae	*Acacia fimbriata*	Brisbane golden wattle		C		2/2
plants	land plants	Leguminosae	*Acacia penninervis var. longiracemosa*			C		1/1
plants	land plants	Leguminosae	*Aeschynomene indica*	budda pea		C		1/1
plants	land plants	Leguminosae	*Canavalia papuana*	wild jack bean		C		1/1
plants	land plants	Leguminosae	*Chamaecrista rotundifolia var. rotundifolia*		Y			1/1
plants	land plants	Leguminosae	*Indigofera spicata*	creeping indigo	Y			1/1
plants	land plants	Leguminosae	*Kennedia rubicunda*	red Kennedy pea		C		1/1
plants	land plants	Leguminosae	*Lablab purpureus*	lablab	Y			1/1
plants	land plants	Leguminosae	*Lotononis bainesii*	lotononis	Y			2/2
plants	land plants	Leguminosae	*Mimosa pudica var. hispida*		Y			1/1
plants	land plants	Leguminosae	*Neonotonia wightii var. wightii*		Y			2/2
plants	land plants	Leguminosae	*Tephrosia rufula*			C		1/1
plants	land plants	Leucobryaceae	*Campylopus introflexus*			C		1/1
plants	land plants	Loranthaceae	*Amyema cambagei*			C		4/4
plants	land plants	Loranthaceae	*Lysiana maritima*			C		1/1
plants	land plants	Lygodiaceae	*Lygodium microphyllum*	snake fern		C		1/1
plants	land plants	Lythraceae	*Rotala rotundifolia*		Y			1/1
plants	land plants	Menyanthaceae	*Nymphoides indica*	water snowflake		SL		1/1
plants	land plants	Moraceae	*Ficus fraseri*	white sandpaper fig		C		1/1
plants	land plants	Moraceae	*Ficus rubiginosa forma rubiginosa*			C		1/1
plants	land plants	Moraceae	*Morus alba*	white mulberry	Y			1/1
plants	land plants	Myrsinaceae	*Aegiceras corniculatum*	river mangrove		C		3/3
plants	land plants	Myrtaceae	*Angophora woodsiana*	smudgee		C		1
plants	land plants	Myrtaceae	*Corymbia citriodora subsp. variegata*			C		1
plants	land plants	Myrtaceae	*Corymbia intermedia*	pink bloodwood		C		1
plants	land plants	Myrtaceae	*Corymbia tessellaris*	Moreton Bay ash		C		1/1
plants	land plants	Myrtaceae	*Corymbia torelliana*	cadaghi		C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Myrtaceae	*Decaspermum humile*	silky myrtle		C		1/1
plants	land plants	Myrtaceae	*Eucalyptus acmenoides*			C		1
plants	land plants	Myrtaceae	*Eucalyptus microcorys*			C		1
plants	land plants	Myrtaceae	*Eucalyptus resinifera*	red mahogany		C		1
plants	land plants	Myrtaceae	*Eucalyptus siderophloia*			C		1
plants	land plants	Myrtaceae	*Eucalyptus tereticornis*			C		1
plants	land plants	Myrtaceae	*Eucalyptus tindaliae*	Queensland white stringybark		C		1
plants	land plants	Myrtaceae	*Gossia acmenoides*			C		1/1
plants	land plants	Onagraceae	*Ludwigia peploides subsp. montevidensis*			C		1/1
plants	land plants	Orchidaceae	*Arthrochilus irritabilis*	leafy elbow orchid		SL		1/1
plants	land plants	Orchidaceae	*Microtis parviflora*	slender onion orchid		SL		1/1
plants	land plants	Philydraceae	*Philydrum lanuginosum*	frogsmouth		C		2/2
plants	land plants	Phyllanthaceae	*Phyllanthus virgatus*			C		1/1
plants	land plants	Phyllanthaceae	*Synostemon hirtellus*			C		1/1
plants	land plants	Poaceae	*Aristida acuta*			C		1/1
plants	land plants	Poaceae	*Aristida calycina var. calycina*			C		1/1
plants	land plants	Poaceae	*Cenchrus clandestinus*		Y			1/1
plants	land plants	Poaceae	*Dichanthium sericeum subsp. sericeum*			C		1/1
plants	land plants	Poaceae	*Digitaria baileyi*			C		1/1
plants	land plants	Poaceae	*Digitaria parviflora*			C		1/1
plants	land plants	Poaceae	*Dinebra decipiens var. decipiens*			C		1/1
plants	land plants	Poaceae	*Eragrostis bahiensis*		Y			1/1
plants	land plants	Poaceae	*Eragrostis curvula*		Y			1/1
plants	land plants	Poaceae	*Eragrostis sororia*			C		1/1
plants	land plants	Poaceae	*Eragrostis spartinoides*			C		1/1
plants	land plants	Poaceae	*Hemarthria uncinata var. uncinata*			C		3/3
plants	land plants	Poaceae	*Hyparrhenia filipendula*	tambookie grass		C		1/1
plants	land plants	Poaceae	*Leersia hexandra*	swamp rice grass		C		2/2
plants	land plants	Poaceae	*Melinis repens*	red natal grass	Y			1/1
plants	land plants	Poaceae	*Panicum paludosum*	swamp panic		C		1/1
plants	land plants	Poaceae	*Paspalidium distans*	shotgrass		C		1/1
plants	land plants	Poaceae	*Paspalum vaginatum*	saltwater couch	Y			1/1
plants	land plants	Poaceae	*Schizachyrium microstachyum*		Y			1/1
plants	land plants	Poaceae	*Setaria sphacelata*		Y			1/1
plants	land plants	Poaceae	*Sporobolus*					2
plants	land plants	Poaceae	*Sporobolus africanus*	Parramatta grass	Y			1/1
plants	land plants	Poaceae	*Sporobolus virginicus*	sand couch		C		2/2
plants	land plants	Polygonaceae	*Persicaria attenuata*			C		1/1
plants	land plants	Polygonaceae	*Persicaria dichotoma*			C		1/1
plants	land plants	Polypodiaceae	*Pyrrosia confluens var. confluens*			SL		1/1
plants	land plants	Pontederiaceae	*Eichhornia crassipes*	water hyacinth	Y			1/1
plants	land plants	Pontederiaceae	*Heteranthera reniformis*		Y			1/1
plants	land plants	Pottiaceae	*Barbula calycina*			C		1/1
plants	land plants	Pottiaceae	*Weissia controversa*			C		1/1
plants	land plants	Pottiaceae	*Weissia perpusilla*			C		1/1
plants	land plants	Proteaceae	*Buckinghamia celsissima*	spotted silky oak		C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Proteaceae	*Persoonia stradbrokensis*			C		1/1
plants	land plants	Restionaceae	*Lepyrodia imitans*			C		1/1
plants	land plants	Rhizophoraceae	*Bruguiera gymnorhiza*	large-fruited orange mangrove		C		3/3
plants	land plants	Rhizophoraceae	*Ceriops australis*			C		3/3
plants	land plants	Rosaceae	*Prunus persica var. persica*		Y			1/1
plants	land plants	Rubiaceae	*Cyclophyllum coprosmoides var. spathulatum*			C		1/1
plants	land plants	Rutaceae	*Melicope micrococca*	white evodia		C		1/1
plants	land plants	Salviniaceae	*Salvinia*					1
plants	land plants	Salviniaceae	*Salvinia molesta*	salvinia	Y			1/1
plants	land plants	Sapindaceae	*Jagera pseudorhus var. pseudorhus*			C		1/1
plants	land plants	Scrophulariaceae	*Myoporum acuminatum*	coastal boobialla		C		1/1
plants	land plants	Scrophulariaceae	*Myoporum boninense subsp. australe*			C		1/1
plants	land plants	Solanaceae	*Solanum chrysotrichum*		Y			1/1
plants	land plants	Sterculiaceae	*Sterculia quadrifida*	peanut tree		C		1/1
plants	land plants	Ulmaceae	*Trema tomentosa*			C		1/1
plants	land plants	Verbenaceae	*Stachytarpheta australis*		Y			1/1
plants	land plants	Verbenaceae	*Verbena litoralis var. brevibracteata*		Y			1/1
plants	land plants	Viburnaceae	*Viburnum odoratissimum var. awabuki*	sweet viburnum 'emerald lustre'	Y			1/1
plants	land plants	Viscaceae	*Notothixos subaureus*	golden mistletoe		C		1/1
plants	land plants	Xyridaceae	*Xyris juncea*	dwarf yellow-eye		C		1/1

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992.*
The codes are Extinct (EX), Extinct in the Wild (PE), Critically Endangered (CR), Endangered (E), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern (C).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.*
The values of EPBC are Extinct (EX), Extinct in the Wild (XW), Critically Endangered (CE), Endangered (E), Vulnerable (V) and Conservation Dependent (CD).

Records - The first number indicates the total number of records of the taxon (wildlife records and species listings for selected areas).
This number is output as 99999 if it equals or exceeds this value. A second number located after a / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

Appendix C

Likelihood of occurrence assessment

Table C1: Likelihood of significant flora to occur in the project site

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
Lesser Swamp-orchid *Phaius australis*	E	E	PMST	***Distribution:*** Occurs between Lake Cathie (near Port Macquarie) and Barron River (west of Cairns). Main populations in south-east Queensland (DoEE, 2019y). ***Habitat preferences:*** This orchid grows primarily in Broad-leaf Paperbark and Swamp Mahogany dominant swampy forests but can occur in depressions and localised seepage areas in open forest and wallum heath. It tends to be restricted to swamp margins. It is often associated with rainforest elements such as Bangalow Palm (*Archontophoenix cunninghamiana*) or Cabbage Tree Palm (*Livistona australis*). This species appears relatively adaptable in its requirements for light and soil type (Benwell 1994; Jones 2006). ***Notable features:*** This is a tall terrestrial orchid with large dark green pleated leaves to 1 m in height and stout flower stem to 2m in height. Large flowers. Flowers between September and November. This species can only be distinguished from other swamp orchids by characteristics of its flowers (DoEE, 2019y). ***Nearest record:*** There are no published records for this species within 5 km of the project site.	Low: The project site does not support or adjoin preferred habitat of this species in the form of paperbark dominated swampy forests. This distinctive species was not recorded during field surveys conducted across the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019).

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
Austral Toadflax *Thesium australe*	V	V	PMST	***Distribution:*** The current distribution of Austral Toadflax is sporadic but widespread, occurring between the Bunya Mountains in south-east Queensland to north-east Victoria and as far inland as the southern, central and northern tablelands in New South Wales and the Toowoomba region . There is an outlier in Carnarvon National Park on the Consuelo Tableland of the southern Brigalow Belt (DoEE, 2019af). ***Habitat preferences:*** Austral Toadflax is semi-parasitic on roots of a range of grass species most notably Kangaroo Grass (*Themeda triandra*). The species occurs in shrubland, grassland or woodland, often on damp sites, on a variety of soil types and altitudes (DoEE, 2019af). ***Notable features:*** Austral Toadflax is a hairless, yellowish-green perennial herb with slender, wiry stems to 40 cm high with tiny white flowers (DoEE, 2019af). This species flowers and fruits throughout the year on the coast and in summer at higher altitudes (DoEE, 2019af). In Queensland the species has been recorded flowering from October through to April (EHP, 2014b). ***Dispersal mode:*** Fruit is a small nut (2-2.5 mm). No information on dispersal mode. ***Nearest record:*** There are no published records for this species within 5 km of the project site.	Low: The project site does not support habitat preferred by this species in the form of vegetation communities with a prevalence of Kangaroo Grass.
Hairy-joint Grass *Arthraxon hispidus*	V	V	PMST	***Distribution:*** This species occurs in scattered locations from Port Douglas, Queensland south to Kempsey, NSW (EHP, 2014a). In Queensland, disjunct populations have been recorded around springs as far west as Carnarvon National Park however	Low: No suitable habitat in the form of moist areas associated with rainforest or wet eucalypt forest occurs within or adjacent to the project site.

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				most occurrences are from Noosa South (EHP, 2014a). In NSW, the species has been recorded as far west as Glen Innes (EHP, 2014a). ***Habitat preferences:*** This species occurs around moist areas in or fringing rainforest, wet eucalyptus forest and woodland (EHP, 2014a). In South East Queensland bioregion the species has also been recorded around freshwater springs on coastal foreshore dunes, in shaded small gullies, on creek banks, and on sandy alluvium in creek beds in open forests (EHP, 2014a). This species has also been recorded growing with bog mosses in mound springs (EHP, 2014a). ***Notable features:*** Hairy Joint Grass is a slender tufted, creeping perennial grass that roots at the nodes and has erect to semi-erect stems. Fertile specimens have been collected from March to May and July (EHP, 2014a). Flowering is also thought to occur from summer to autumn (EHP, 2014a). ***Nearest record:*** There are no published records for this species within 5 km of the project site.	This distinctive species was not recorded during field surveys conducted across the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019).
Leafless Tongue-orchid *Cryptostylis hunteriana*	V	LC	PMST	***Distribution:*** Occurs from eastern Victoria to southeast Queensland in a range of habitats. In Queensland, the species is know from five populations between Glasshouse Mountains and Tinnanbar (north of Tin Can Bay) (TSSC, 2008b).	Low: The project site does not support or adjoin preferred habitat of this species in the form of heathland, swamps, sedgeland, dry woodland and lowland rainforest on sandy soils.

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				Habitat preferences: This species occurs in sandy heathland, coastal heathland, margins of coastal swamps and sedgeland, dry woodland and lowland forest (TSSC, 2008b). ***Notable features:*** The labellum of the Leafless Tongue-orchid is erect, dark red, with a hairy upper surface and a wide central black band that becomes four black lines (DoEE, 2019l). Most of the labellum's upper surface is covered with dense glandular hairs (DoEE, 2019l). ***Dispersal mode:*** The flowering period for the Leafless Tongue-orchid is generally from August to February with flowering taking place earlier in Queensland than in NSW and Victoria (DoEE, 2019l). Dispersal is thought to be by wind or gravity. ***Nearest record:*** There are no records for this species within 5 km of the project site.	This distinctive species was not recorded during field surveys conducted across the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019).
Macadamia Nut *Macadamia integrifolia*	V	V	PMST	***Distribution:*** This species is known from remnant rainforest in northern New South Wales and south-east Queensland (from Mt Bauple, north of Gympie to the Currumbin Valley in the Gold Coast hinterland) (DoEE, 2019s). ***Habitat preferences:*** This species occurs in complex notophyll mixed forest, extremely tall closed forest, simple notophyll mixed very tall closed forest to simple microphyll-notophyll mixed mid-high closed forest with *Araucaria* and *Argyrodendron* emergents as	Low: The project site does not support or adjoin preferred habitat of this species in the form of tall open forest or rainforest. This distinctive species was not recorded during field surveys conducted across the project site (Duke Environmental 2016; Ecological Survey & Management 2019)

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				well as partially open areas along the edges of remnant rainforest (DoEE, 2019s).. The species will grow on a wide range of landforms from hill crests to gullies with level to steep surfaces. Soils are typically well drained, high nutrient volcanics of varying texture (DoEE, 2019s).. ***Notable features:*** The species has been recorded flowering in January, March and from June to November with fruits recorded from November to January and March to April (DoEE, 2019s). ***Dispersal mode:*** Seeds (nut) are typically eaten by mammals and dispersed by stream (DoEE, 2019s). ***Nearest record:*** There are no records for this species within 5 km of the project site.	
Quassia *Samadera bidwillii*	V	V	PMST	***Distribution:*** Quassia is endemic to Queensland and is currently known to occur in several localities between Scawfell Island, near Mackay, and Goomboorian, north of Gympie (DoEE, 2019ad). Quassia has been confirmed as occurring in at least 40 sites within this range (DoEE, 2019ad). Known populations occur along the Mary River; Tinana Creek, Tallegalla Weir, Teddington Weir pondage, and from Teddington Weir to Tiana Barrage (DoEE, 2019ad). **Habitat preferences:** Quassia commonly occurs in lowland rainforest or on rainforest margins, but it can also be found in other	Low: The project site does not support or adjoin preferred habitat of this species in the form of lowland rainforest, open forest or woodland. This distinctive species was not recorded during field surveys conducted across the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019).

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				forest types, such as open forest and woodland (DoEE, 2019ad). **Notable features:** Quassia flowers have been recorded in November, December, January and March. Fruit has been recorded from February to April (DoEE, 2019ad). ***Nearest record:*** There are no published records for this species within 5 km of the project site.	
Rough-shelled Bush Nut *Macadamia tetraphylla*	V	V	PMST	***Distribution:*** Rough-shelled Bush Nut occurs from northern NSW (mainly the Richmond and Tweed River areas) to south-east Queensland (from the Gold Coast hinterland north to Mt Wongawallan) (DoEE, 2019u). In Queensland Records include Wyangan Creek, Mudgeeraba; Upper Tallebudgera-Mount Cougal, partly within Springbrook National Park; Natural Bridge, Springbrook National Park; Montville-Maleny, north of Brisbane (possibly cultivated populations); Nicoll Scrub National Park; Lower Bellbird, Lamington National Park; and from freehold properties at Numinbah Valley/Cave Creek, Camp Bornhoffen, Numinbah Valley, Beechmont and Mudgeerabah (DoEE, 2019u). ***Habitat preferences:*** Rough-shelled Bush Nut is a rare species that generally occurs in subtropical rainforest and complex notophyll vineforest, at the margins of these forests	Low: The project site does not support or adjoin preferred habitat of this species in the form of subtropical rainforest and complex notophyll vine forest, at the margins of these forests and in mixed sclerophyll forest. This distinctive species was not recorded during field surveys conducted across the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019).

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				and in mixed sclerophyll forest (DoEE, 2019u). ***Notable features:*** Leaves in whorls of four. Flowers with distinctive pink colour. Rough-shelled Bush Nut flowers from August to October, and is recorded fruiting between January and April (DoEE, 2019u). ***Nearest record:*** There are no published records for this species within 5 km of the site.	
Small-fruited Queensland Nut *Macadamia ternifolia*	V	V	PMST	***Distribution:*** The Small-fruited Queensland Nut is endemic to Queensland. Historically, the species was recorded east of the Main Divide from Kin Kin, near Gympie; and south to the Pine River, north of Brisbane. Following extensive habitat clearing, the species is now considered extremely rare in the wild and is restricted to an area between Mount (Mt) Pinbarren (northern extent) and Mary Cairncross Park near Maleny (southern extent) (a distance of almost 50 km) (TSSC, 2008d). ***Habitat preferences:*** The Small-fruited Queensland Nut's remaining habitat is fragmented and found within lowland warm complex notophyll vine forest and Araucarian notophyll vine forest on basic and intermediate volcanic soils and alluvia in higher rainfall areas of south-east Queensland (DoEE, 2019t).	Low: The project site does not support or adjoin preferred habitat of this species in the form of lowland warm complex notophyll vine forest and *Araucarian* notophyll vine forest on basic and intermediate volcanic soils and alluvia. This distinctive species was not recorded during field surveys conducted across the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019).

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				Notable features: New growth is pink to red in colour (DoEE, 2019t). ***Dispersal mode:*** Flowering in the species has been recorded from June to October with fruits from December to March and dispersal is via streams or rodents (DoEE, 2019t). ***Nearest record:*** There are no published records for this species within 5 km of the project site.	
Stinking Cryptocarya *Cryptocarya foetida*	V	V	PMST	***Distribution:*** The Stinking Cryptocarya has been recorded from near Iluka, on the north coast of New South Wales, to Fraser Island in Queensland (TSSC, 2008a). ***Habitat preferences:*** The Stinking Cryptocarya is restricted to coastal sands, or if not, then close to the coast, occurring in littoral rainforest on old sand dunes and subtropical rainforests over slate and occasionally on basalt to an altitude of 150m (TSSC, 2008a). ***Notable features:*** Stinking Cryptocarya is a medium sized tree growing to 25m tall with the main leaf vein being prominent and crooked (DoEE, 2018a). Main flowering and fruiting period is thought to be February however flowers have been recorded in December and May. Fruits have been collected in January and June to August (DoEE, 2019k).	Low: The preferred habitat of this species in the form of littoral rainforest on coastal sands is not present within or adjacent in the project site. This distinctive species was not recorded during field surveys conducted across the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019).

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				Nearest record: There are no published records for this species within 5 km of the project site.	
Three-leaved Bosistoa *Bosistoa tranversa*	V	LC	PMST	***Distribution:*** This species is known from Mullumbimby, NSW, to Mt Larcom near Gladstone, Queensland. Occurs in wet sclerophyll forest, dry sclerophyll forest and rainforest up to 300 m in altitude (Harden et al. 2006; TSSC 2008c). ***Habitat preferences:*** This species grows in wet sclerophyll forest, dry sclerophyll forest and rainforest up to 300 m in altitude. Associated vegetation includes *Argyrodendron trifoliolatum*, *Syzygium hodgkinsoniae*, *Endiandra pubens*, *Dendrocnide photinophylla*, *Acmena ingens*, *Diploglottis australis* and *Diospyros mabacea* (TSSC 2008c) ***Notable features:*** *S*mall to medium tree growing to 22 m high. Leaves are 5–16 cm long, 2.5–9 cm wide; leaflets 1–3, tips pointed to rounded, bases round to wedge-shaped or heart-shaped. Flowers are small and white, and arranged in loose clusters at or near the tips to the branches. Fruit are 1 cm wide, hard, transversely ribbed, egg-shaped and have one kidney-shaped seed. ***Nearest record:*** There are no published records for this species within 5 km of the project site.	Low: The project site does not support or adjoin preferred habitat of this species in the form of rainforest, wet sclerophyll or dry sclerophyll forest. This distinctive species was not recorded during field surveys conducted across the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019).

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
Wedge-leaved Tuckeroo *Cupaniopsis shirleyana*	V	V	PMST	***Distribution:*** This small tree is found from south-eastern and central Queensland, between Brisbane and Curtis Island (TSSC, 2008c). ***Habitat preferences:*** The species prefers dry rainforest communities, including vine thickets and scrubby urbanised areas on moderate to very steep slopes, gullies and rocky stream channels between 60-550 m above sea level (TSSC, 2008c). It grows in dark brown sandy loams and sandy clay loams and rocky scree slopes, often derived from volcanic parent materials (i.e. granites, granodiorites, basalt and andesitic flows, pyroclastics) (DCCEEW, 2022b). Vegetation assemblages in which this species has been recorded includes mostly simple microphyll closed forests to tall closed forest, often with Hoop Pine (*Araucaria cunninghamii*) and sometimes simple notophyll vine forest (DCCEEW, 2022b). ***Notable features:*** This tree flowers from April to June and fruits late June (DCCEEW, 2022b). ***Nearest record:*** There are no published records for this species within 5 km of the project site.	Low: The project site does not support or adjoin preferred habitat of this species in the form of rainforest, wet sclerophyll or dry sclerophyll forest. This distinctive species was not recorded during field surveys conducted across the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019).
Knotweed *Persicaria elatior*	V	V	PMST	***Distribution:*** This herb is known from the North Coast, Central Coast and South Coast	Low: Wetland habitat and preferred species assemblages, including paperbark (*Melaleuca* spp.) wetlands

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				of New South Wales as well as south-east Queensland (DEWHA, 2008a). ***Habitat preferences:*** Preferred habitat includes coastal swampy areas, along watercourses streams and lakes, swamp forest, herblands and disturbed areas, on sandy, alluvial soil in swampy and riparian areas, along watercourses and lake edges. It has been associated with *Melaleuca linearifolia*, *M. quinquenervia*, *Lophostemon suaveolens*, *Casuarina glauca*, *Corymbia maculata*, *Pseudognaphalium luteoalbum*, *Persicaria hydropiper*, *Floydia praealta* and *Cyperus semifertilis* (DEWHA, 2008a; DCCEEW, 2022c). ***Notable features:*** Flowering mostly occurs in summer. This is a short-lived species, living for up to two years (DCCEEW, 2022c). ***Nearest record:*** There are no published records for this species within 5 km of the project site.	are not located within or adjacent to the project site.
Scrub Turpentine *Rhodamnia rubescens*	CE	CR	PMST	***Distribution:*** This is a shrub or small tree that occurs in coastal districts of New South Wales from Batemans Bay to Bundaberg in Queensland. The species can occur further inland onto escarpments up to 600 m above sea level where rainfall between 1,000-1,600 mm occurs (TSSC, 2020a). ***Habitat preferences:*** Habitat in which this species occurs includes all types of rainforest, except cool temperate rainforest,	Low: Suitable underlying substrate and rainforest associations preferred by this species are not present within the project site.

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				and in transition zones between wet sclerophyll and rainforest associations, including creek side riparian associations. It may also be a pioneer species in eucalypt and grassy woodland associations. It grows in a range of volcanically derived and sedimentary soils (TSSC, 2020a). ***Nearest record:*** There are no published records for this species within 5 km of the project site.	
Native Guava *Rhodomyrtus psidioides*	CE	CR	PMST	***Distribution:*** This species has been recorded in coastal and sub-coastal areas of low elevation from Gosford in New South Wales to Maryborough in Queensland, although can occasionally occur up to 120 km inland near the Border Ranges (TSSC, 2020b). ***Habitat preferences:*** This is a shrub or small tree known from subtropical rainforests, warm temperate rainforests, littoral rainforest and wet sclerophyll forests and margins of adjoining sclerophyll vegetation. It is known to be a pioneer species in disturbed environments (TSSC, 2020b). ***Notable features:*** The species flowers in late spring to early summer and fruits in summer (TSSC, 2020b).	Low: Preferred rainforest habitat is not present within the project site.

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				Nearest record: There are no published records for this species within 5 km of the project site.	

[1]Status:
- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*: CE = Critically endangered, E = Endangered; V = Vulnerable
- Queensland *Nature Conservation Act 1992*: E, Endangered; V = Vulnerable; LC = Least concern

[2] - PMST – Protected Matters Search Tool (refer to PMST database results contained in Appendix B)

Table C2: Likelihood of significant fauna to occur in the project site

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
Amphibians					
Fleay's Frog *Mixophyes fleayi*	E	E	PMST	***Distribution:*** This species is narrowly and disjunctly distributed in wet forests from the Conondale Range in south-east Queensland, south to Yabbra Scrub in north-east New South Wales. While the majority of records for the species are from altitudes above 400m, Fleay's Frog is also known from lowland rainforest; 200 m (DoEE, 2019v). ***General habitat preferences:*** Fleay's Frog is associated with montane rainforest and open forest communities adjoining rainforest (DoEE, 2019v). The species occurs along stream habitats from first to third order streams (i.e. small streams close to their origin through to permanent streams with grades of 1 in 50) and is not found in ponds or ephemeral pools. In Queensland, important habitat has been defined as: 'permanent and semi-permanent freshwater streams, between 100-1000 m in altitude, in rainforest and other forest communities of the McPherson, Main and Conondale Ranges, Mt Tamborine, and the Mistake and Bunya Mountains' (DoEE, 2019v). ***Nearest record:*** There are no published records for this species within 5 km of the project site.	Low: The project site does not support or adjoin preferred habitat for this species in the form of montane rainforest and adjoining open forests. This species was not recorded during fauna surveys completed across the project site (Duke Environmental, 2016b).
Giant Barred Frog *Mixophyes iterates*	V	V	PMST	***Distribution:*** This large frog is sparsely distributed from Doongul Creek, near Hervey Bay, in south-east Queensland to Warrimoo, in the Blue Mountains, New South Wales. It occurs at elevations between 100 and 1,000 m. There are three distributional zones known for this species, which appear to be influenced by wetter areas: northern distribution (north and west of Brisbane), central distribution (west and south-west of the Gold Coast in Queensland south to the ranges north-west of Newcastle in New South Wales); and the southern distribution (from the	Low: The project site does not support or adjoin preferred habitat for this species in the form of riparian rainforest or wet sclerophyll forest. This species was not recorded during fauna surveys completed across the project site (Duke Environmental, 2016b).

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				Hunter Valley, through the Hawksbury River catchment, to the Blue Mountains in New South Wales) (TSSC, 2021). ***General habitat preferences:*** This is a ground-dwelling frog that occurs in a narrow strip of vegetation either side of permanent flowing drainage channels (i.e. shallow, rocky rainforest streams to slow-moving rivers). Pools in larger streams are preferred. It is known from lowland open wet-forests (rainforest and wet sclerophyll forest) and sometimes drier forest or degraded riparian remnants and sometimes in cleared land and around dams (TSSC, 2021). ***Nearest record:*** There are no published records for this species within 5 km of the project site.	
Birds					
Australian Fairy Tern *Sternula nereis nereis*	V	LC	PMST	***Distribution:*** This species occurs along the coasts of New South Wales, Victoria, Tasmania, South Australia and Western Australia and is not known to occur as far north as Queensland (DSEWPaC, 2011). Therefore, this species is highly unlikely to occur in the project site and has not been considered further.	
Curlew Sandpiper *Calidris ferruginea*	CE	E	Wildlife Online, ALA, PMST	***Distribution:*** This species occurs along the coasts but is also widespread inland. In Queensland there are scattered records in the Gulf of Carpentaria, widespread records along the coast, south of Cairns, and sparsely scattered records inland (DoEE, 2019f). ***General habitat preferences:*** Near the coast it inhabits intertidal mudflats in sheltered areas, such as estuaries, bays inlets and lagoons and non-tidal swamps, lakes, lagoons, ponds in saltworks and sewage farms (DoEE, 2019f). Inland they are occasionally recorded around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. The will use fresh and brackish habitats and floodwaters (DoEE, 2019f). The usually wade and forage in waters 15-30 mm deep, but up to 60 mm deep at the edge of saltmarsh, emergent	**High:** There are numerous records for this species within 5 km of the project site. Coastal wetland habitat within the project site provide potential forage and roosting habitat for this species. This species was not recorded during field surveys within the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019).

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				vegetation and inundated saltflats. It feeds on invertebrates, including worms, molluscs, crustaceans, and insects as well as seeds (DoEE, 2019f). The species usually roosts on bare dry shingle, shell or sand beaches, sandspits and islets and sometimes in dunes (DoEE, 2019f). This species does not breed in Australia. ***Nearest record:*** There are 215 Wildlife Online records within 5 km of the project site.	
Eastern Curlew *Numenius madagascariensis*	CE	E	Wildlife Online, ALA, PMST	***Distribution:*** Within Australia, the eastern curlew has a primarily coastal distribution. The species is found in all states, particularly the north, east, and south-east regions including Tasmania. Eastern curlews are rarely recorded inland (TSSC 2015a). They have a continuous distribution from Barrow Island and Dampier Archipelago, Western Australia, through the Kimberley and along the Northern Territory, Queensland, and NSW coasts and the islands of Torres Strait. They are patchily distributed elsewhere (TSSC 2015a). ***General habitat preferences:*** During the non-breeding season in Australia, the Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass (TSSC 2015a). Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. The birds are often recorded among saltmarsh and on mudflats fringed by mangroves, and sometimes within the mangroves. The birds are also found in coastal saltworks and sewage farms (TSSC 2015a). The eastern curlew mainly forages during the non-breeding season on soft sheltered intertidal sandflats or mudflats, open and without vegetation or covered with seagrass, often near mangroves, on saltflats and in saltmarsh,	**High:** There are numerous records for this species within 5 km of the project site. Coastal wetland habitat within the project site provide potential forage and roosting habitat for this species. This species was not recorded during field surveys within the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019).

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				rockpools and among rubble on coral reefs, and on ocean beaches near the tideline (TSSC 2015a). The birds are rarely seen on near-coastal lakes or in grassy areas (TSSC 2015a). ***Nearest record:*** There are 523 Wildlife Online records within 5 km of the project site.	
Great Knot *Calidris tenuirostris*	CE	E	Wildlife Online, ALA, PMST	***Distribution:*** The Great Knot has been recorded around the entirety of the Australian coast, with a few scattered records inland. It is now absent from some sites along the south coast where it used to be a regular visitor (DoEE, 2019g). The greatest numbers are found in northern Australia, other important sites include the Broad Sound-Shoalwater Bay area, the Mackay region and Moreton Bay in Queensland (DoEE, 2019g). ***General habitat preferences:*** In Australasia, the species typically prefers sheltered coastal habitats, with large intertidal mudflats or sandflats (DoEE, 2019g). This includes inlets, bays, harbours, estuaries and lagoons. They are occasionally found on exposed reefs or rock platforms, shorelines with mangrove vegetation, ponds in saltworks, at swamps near the coast, salt lakes and non-tidal lagoons. The Great Knot rarely occurs on inland lakes and swamps (DoEE, 2019g). ***Roosting habitat:*** Typically, the Great Knot roosts in large groups in open areas, often at the water's edge or in shallow water close to feeding grounds. It is known that in hot conditions, waders prefer to roost where a damp substrate lowers the local temperature (DoEE, 2019g). ***Breeding habitat:*** This species doesn't breed in Australia. ***Nearest record:*** There are 195 Wildlife Online for this species within 5 km of the project site.	**High:** There are numerous records for this species within 5 km of the project site. Coastal wetland habitat within the project site provide potential forage habitat for this species. This species was not recorded during field surveys within the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019).

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
Regent Honeyeater (*Anthochaera phrygia*)	CE	CE	PMST	***Distribution:*** The Regent Honeyeater is endemic to south-east Australia, where its range extends from south-east Queensland to central Victoria. In Queensland, the Regent Honeyeater has been recorded from 15 sites, primarily south of a line between Chinchilla and the Sunshine Coast. There are several records on Bribie Island and the Granite Belt between Warwick in the east, Gore in the west and Sundown NP in the south (DoEE, 2019a). ***General habitat preferences:*** Regent Honeyeaters mostly occur in dry Box-Ironbark eucalypt woodland and dry sclerophyll forest associations in areas of low to moderate relief. The species tends to prefer moister, more fertile sites, for example along creek flats, or in broad river valleys and foothills. The Regent Honeyeater is believed to use lowland coastal forest as a refuge when the preferred box-ironbark habitats are affected by drought (DoEE, 2019a). ***Foraging habitat:*** Regent Honeyeaters typically are associated with plant species that reliably produce copious amounts of nectar particularly species of ironbark and box (DoEE, 2019a). ***Breeding habitat:*** Regent Honeyeaters usually nest in the canopy of forests or woodlands, and in the crowns of tall trees, mostly eucalypts. The species shows a preference for tall mature rough bark species such as ironbarks. Nests have also been recorded from amongst mistletoes (DoEE, 2019a). ***Notable features:*** The Regent Honeyeater has a black head, with a patch of warty, dirty yellowish to pinkish skin around its dark red-brown eye, and a sturdy, decurved, black bill. ***Nearest record:*** There are no records for this species within 5 km of the project site.	Low: The underlying geology, landform and vegetation present in the project site is not consistent with the habitat requirements of the Regent Honeyeater in that: ▪ Box-Ironbark dominated woodlands are not present ; and ▪ moist, fertile communities associated with creek flats, broad river valleys and/or foothills are not present. This distinctive species was not recorded within during field surveys within the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019).

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
Swift Parrot *Lathamus discolour*	CE	E	PMST	***Distribution:*** The swift parrot breeds in Tasmania during the summer and the entire population migrates north to mainland Australia for the winter (TSSC, 2016c). The species has been recorded from Victoria through coastal New South Wales to coastal south eastern and central Queensland. ***General habitat preferences:*** Whilst on the mainland the swift parrot disperses widely to forage on flowers and psyllid lerps in *Eucalyptus* species, with the majority being found in Victoria and New South Wales. ***Foraging habitat:*** In Victoria, swift parrots are predominantly found in the dry forests and woodlands of the box-ironbark region on the inland slopes of the Great Dividing Range (TSSC, 2016c). In New South Wales, Swift Parrots forage in forests and woodlands throughout the coastal and western slopes regions each year. Coastal regions tend to support larger numbers of birds when inland habitats are subjected to drought (TSSC, 2016c). ***Breeding preferences:*** This species only breeds in Tasmania (TSSC, 2016c). ***Nearest record:*** There are no Wildlife Online records for this species within 5 km of the project site.	Low: This species is an occasional non-breeding occurrence in South-East Queensland. While the project site supports Queensland Blue Gum, the absence of records in search area indicates that this species does not frequent the project site and surrounds when foraging. This distinctive species was not recorded within during field surveys within the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019).
Australian Painted Snipe *Rostratula australis*	E	E	Wildlife Online, ALA, PMST	***Distribution:*** The Australian Painted Snipe has been recorded at wetlands in all states of Australia. It is most common in eastern Australia, where it has been recorded at scattered locations throughout much of Queensland, New South Wales, Victoria and south-eastern South Australia. This population is considered to occur as a single, contiguous breeding population (DoEE, 2019ab). ***General habitat preferences:*** This secretive, cryptic, crepuscular (active at dawn, dusk and during the night) species occurs in terrestrial shallow wetlands, both ephemeral and permanent, usually freshwater but occasionally brackish. They also use inundated grasslands,	Low: The project site does not support or adjoin terrestrial freshwater wetlands with a matrix of mud flats and vegetation that are preferred by this species. This distinctive species was not recorded during fauna surveys completed across the project site (Duke Environmental, 2016b).

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				salt-marsh, dams, rice crops, sewage farms and bore drains with rank emergent tussocks of grass, sedges, rushes or reeds or samphire, and often with scattered clumps of Lignum (*Muehlenbeckia florulenta*), canegrass or sometimes tea trees. It has been known to use areas lined with trees, or that have some scattered fallen or washed-up timber (DoEE, 2019ab). ***Foraging habitat:*** The species feeds on vegetation, seeds, and invertebrates including crustaceans and molluscs as well as insects, worms and other invertebrates. Foraging habitats are not well understood (DoEE, 2019ab). ***Breeding habitat:*** Requirements are specific and include shallow wetlands with areas of bare wet mud and both upper and canopy cover nearby. Almost all records of nests occur on or near small islands in freshwater wetlands characterised by a combination of very shallow water, exposed mud, dense low cover and sometimes some tall dense cover. Although this species uses modified habitat, it doesn't necessarily breed in these habitats. It most likely breeds in response to wetland conditions rather than during a particular season (DoEE, 2019ab). ***Nearest record:*** There are 3 Wildlife Online records for this species within 5 km of the project site.	
Australasian Bittern *Botaurus poiciloptilus*	E	E	PMST, Wildlife Online	***Distribution:*** The Australasian Bittern occurs from south-east Queensland to south-east South Australia, Tasmania and the south-west of Western Australia (DoEE, 2019d). In Queensland, the Australasian Bittern occurs in the far south-east where it has been reported north to Baralaba and west to Wyandra. At present the species is rarely recorded in Queensland and my only survive in protected areas such as the Cooloola and Fraser regions (DoEE, 2019d). ***General habitat preferences:*** The Australasian Bittern occurs in terrestrial freshwater wetlands and, rarely,	Low: The project site does not support or adjoin substantial and permanent freshwater wetlands with tall, dense vegetation that are preferred by this species. This distinctive species was not recorded during fauna surveys completed across the project site (Duke Environmental, 2016b).

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				estuarine habitats. The species favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and/or reeds or cutting grass (*Gahnia*) growing over muddy or peaty substrate (DoEE, 2019d). ***Foraging habitat:*** The species favours wetlands with tall, dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water (DoEE, 2019d). ***Breeding habitat:*** Knowledge of the breeding ecology of the Australasian Bittern is relatively poor. The limited information available indicates that the species breeds in relatively deep, densely vegetated freshwater swamps and pools, building its nests in deep cover over shallow water (DoEE, 2019d). ***Nearest record:*** There are 4 Wildlife Online records for this species within 5 km of the project site.	
Coxens Fig Parrot *Cyclopsitta diophthalma coxeni*	E	E	PMST	***Distribution:*** The distribution of Coxen's Fig-Parrot is poorly known. Based on accepted records, the core distribution extends from Gympie in south-eastern Queensland to the Richmond River in north-eastern New South Wales, and west to the Bunya Mountains, Main Range and Koreelah Range (DoEE, 2019m). In Queensland, the most recent reliable records of Coxen's Fig-Parrot are from near Imbil, Kin Kin Creek, Upper Pinbarren Creek, Montville, the Maleny area, Mount Glorious, Main Range National Park and Lamington National Park (DoEE, 2019m). ***General habitat preferences:*** Coxen's Fig-Parrot occupies habitats that occur from sea level to approximately 900 m above sea level (DoEE, 2019m). Coxen's Fig-Parrot occurs in rainforest habitats including subtropical rainforest, dry rainforest, littoral and developing littoral rainforest, and vine forest (DoEE, 2019m). Most recent records of the fig-parrot have been	Low: The project site does not support rainforest habitat that is preferred by this species.

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				from small stands of remnant native vegetation, at forest edges, and in thin tracts of gallery forest (at edges of rivers or streams). Coxen's Fig-Parrot has also been recorded in other habitat types including sub-littoral mixed scrub; corridors of riparian vegetation in woodland, open woodland or other types of cleared or partially-cleared habitat; and isolated stands of fig or other trees on urban, agricultural or cleared land (DoEE, 2019m). ***Breeding habitat:*** Nests of Coxen's Fig-Parrot have been recorded in subtropical rainforest and dry rainforest, and in the ecotone (i.e. the zone of transition) between subtropical rainforest and sclerophyll forest (DoEE, 2019m). ***Nearest record:*** There are no records for this species within 5 km of the project site.	
Lesser Sand Plover *Charadrius mongolus*	E	E	Wildlife Online, ALA, PMST	***Distribution:*** Within Australia, the Lesser Sand-Plover is widespread in coastal regions, and has been recorded in all states (DoEE, 2019j). It mainly occurs in northern and eastern Australia, in south-eastern parts of the Gulf of Carpentaria, western Cape York Peninsula and islands in Torres Strait, and along the entire east coast, though it occasionally also occurs inland. It is most numerous in Queensland and NSW (DoEE, 2019j). ***General habitat preferences:*** In non-breeding grounds in Australia, this species usually occurs in coastal littoral and estuarine environments (DoEE, 2019j). It inhabits large intertidal sandflats or mudflats in sheltered bays, harbours and estuaries, and occasionally sandy ocean beaches, coral reefs, wave-cut rock platforms and rocky outcrops. It also sometime occurs in short saltmarsh or among mangroves. The species also inhabits saltworks and near-coastal saltpans, brackish swamps and sandy or silt islands in river beds (DoEE, 2019j)..	**High:** There are a number of records for this species within 5 km of the project site. Coastal wetland habitat within the project site provide potential forage and roosting habitat for this species. This species was not recorded during field surveys within the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019)

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				Foraging habitat: The species feeds mostly on extensive, freshly-exposed areas of intertidal sandflats and mudflats in estuaries or beaches, or in shallow ponds in saltworks (DoEE, 2019j). They also occasionally forage on coral reefs and on sandy or muddy river margins. At inland sites, they have been recorded foraging in muddy areas around lakes, soaks and bores (DoEE, 2019j). ***Roosting habitat:*** This species roosts near foraging areas, on beaches, banks, spits and banks of sand or shells and occasionally on rocky spits, islets or reefs. They rarely roost in mangroves (DoEE, 2019j). ***Breeding habitat:*** This species doesn't breed in Australia. ***Nearest record:*** There are 18 Wildlife Online records for this species within 5 km of the project site.	
Red Knot *Calidris canutus*	E	E	Wildlife Online, ALA, PMST	***Distribution:*** The Red Knot is common in all the main suitable habitats around the coast of Australia, but is less numerous in south-west Australia than elsewhere (DoEE, 2019e). The only places it is not found in significant numbers are the northern part of the Great Australian Bight in South Australia and Western Australia, and along much of the NSW coast, where wader habitat is rather scarce (excluding the Hunter Estuary) (DoEE, 2019e). This species does not breed in Australia. ***General habitat preferences:*** This species is typically associated with intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs (DoEE, 2019e). They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps. The Red Knot roosts on	**High:** There are numerous records for this species within 5 km of the project site. Coastal wetland habitat within the project site provide potential forage habitat for this species. This species was not recorded during field surveys within the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019)

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				sandy beaches, spits and islets, and mudflats; also in shallow saline ponds of saltworks (DoEE, 2019e). ***Nearest record:*** There are 105 Wildlife Online records for this species within 5 km of the project site.	
Black-breasted Button Quail (*Turnix melanogaster*)	V	V	PMST	***Distribution:*** Endemic to eastern Australia, this species is restricted to coastal and near-coastal regions of south-eastern Queensland and north-eastern New South Wales (DoEE, 2019ag). The main populations occur within south-east Queensland, where the current known distribution extends from near Byfield in the north, south to the New South Wales border and westwards to Palm Grove National Park and Barakula State Forest (DoEE, 2019ag). The most significant populations appear to be in the Yarraman-Nanango, Jimna-Conondale and Great Sandy regions. ***General habitat preferences:*** This species is most commonly associated with vine thicket rainforest with greater than 800 mm rainfall, deep leaf litter and a closed canopy but also occur in softwood scrubs in the Brigalow Belt, vine scrub regrowth and mature Hoop Pine (*Araucaria cunninghamii*) particularly with a Common Lantana (**Lantana camara*) understorey. They also occur in dry sclerophyll forest adjacent to rainforest and *Acacia* and *Austromyrtus* scrubs on sandy coastal sols (Inskip Point) (Garnett et al., 2011). ***Foraging habitat:*** An extensive dense leaf-litter layer is required for foraging (DoEE, 2019ag). As such, optimum habitat is often associated with highly fertile soils. It is believed that the highly fertile soils promote rapid leaf growth on plants, which dropped to the ground during dry periods thus maintaining the deep leaf litter layer which is crucial to the foraging requirements of the species (DoEE, 2019ag). In Googa State Forest, south-eastern Queensland, birds are most commonly associated with remnant microphyll vine forest with no lantana in the	Low: The project site is located in an urbanised area and does not support vine thicket rainforest or mature Hoop Pine forest that are preferred by the Black-breasted Button Quail.

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				understorey, but lantana is often used for diurnal foraging and nocturnal roosting (DoEE, 2019ag). ***Breeding habitat:*** Nests consist of a scrape in the ground, lined with leaves, grass or moss (DoEE, 2019ag). Fallen logs and a dense, heterogeneously distributed shrub layers are also considered to be important habitat characteristics for shelter and breeding. Nests are often in areas where the common understorey plants include species such as Bracken (*Pteridium esculentum*), Rasp Fern (*Doodia aspera*) and Lantana (*Lantana camara*) and are often placed in the buttress root of a tree or sapling, the base of a fern or under a low bush or grass tussock(DoEE, 2019ag). ***Notable features:*** Black-breasted Button quail are commonly seen in pairs or occasionally in small groups. This species is cryptic in nature and direct observation can be difficult. One of the key methods of detecting the presence of birds in an area is the presence of feeding traces (platelets) (DoEE, 2019ag). ***Nearest record: Nearest record:*** There are no Wildlife Online records for this species within 5 km of the project site.	
Greater Sand Plover *Charadrius leschenaultii*	V	V	PMST, Wildlife Online	***Distribution:*** In Australia, the Greater Sand Plover occurs in coastal areas in all states, though the greatest numbers occur in northern Australia, especially the north-west (DoEE, 2019i). In northern Australia, the species is especially widespread between North West Cape and Roebuck Bay in Western Australia. The area of occupancy of the Greater Sand Plover in Australia has been estimated at 35 600 km². ***General habitat preferences:*** In the non-breeding grounds in Australasia, the species is almost entirely coastal, inhabiting littoral and estuarine habitats (DoEE 2018n. They mainly occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or	**High:** There are records for this species within 5 km of the project site. Coastal wetland habitat within the project site provide potential forage and roosting habitat for this species. This species was not recorded during field surveys within the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019).

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				sandbanks, as well as sandy estuarine lagoons and inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs (DoEE, 2019i). ***Foraging habitat:*** This species usually feed from the surface of wet sand or mud on open intertidal flats of sheltered embayments, lagoons or estuaries (DoEE, 2019i). ***Roosting habitat:*** They usually roost on sand-spits and banks on beaches or in tidal lagoons, and occasionally on rocky points. They tend to roost further up the beach than other waders, sometimes well above high-tide mark (DoEE, 2019i). ***Breeding habitat:*** This species doesn't breed in Australia. ***Nearest record:*** There are 4 Wildlife Online records for this species within 5 km of the project site.	
Squatter Pigeon (southern) *Geophaps scripta scripta*	V	V	PMST	***Distribution:*** The southern sub-species for the Squatter Pigeon (southern subspecies) is described as occurring south of the Burdekin River-Lynd divide in the southern region of Cape York Peninsula to the Border Rivers region of northern New South Wales, and from the east coast to Hughenden, Longreach and Charleville (Higgins & Davies, 1996). The known distribution of the southern sub-species overlaps with the known distribution of the northern subspecies (DoEE, 2019p). ***General habitat preferences:*** This species is known from tropical dry, open sclerophyll woodlands and sometimes savannah with *Eucalyptus*, *Corymbia*, *Acacia* or *Callitris* species in the overstorey. The groundcover layer is patchy consisting of native, perennial tussock grasses or a mix of grasses and low shrubs or forbs. However, the groundcover layer rarely exceeds 33% of the ground area. It appears to favour sandy soil dissected with low gravely ridges and is less common on heavier soils with dense grass cover. It is nearly always found in close association i.e. within 3 km,	Low: The project site does not support habitat suitable for this species in the form of eucalypt woodland with a patchy ground layer. The ground layer of the project site's woodland communities easily exceeds 33% cover. The project site also lacks sandy soils and gravelly ridges that are preferred by this species. This distinctive species was not recorded during field surveys within the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019).

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				with permanent water. While the species is unlikely to move far from woodland trees, where scattered trees still occur and the distance of cleared land between remnant trees or patches of habitat does not exceed 100 m, individuals may be found foraging in, or moving across modified or degraded environments (DoEE, 2019p). ***Foraging habitat:*** This occurs in any remnant or regrowth open-forest to sparse, open woodland or scrub dominated by *Eucalyptus*, *Corymbia*, *Acacia* or *Callitris* species, on sandy or gravelly soils. It feeds primarily on seeds of grasses, herbs and shrubs (DoEE, 2019p). ***Breeding habitat:*** This occurs on well-draining, stony rises occurring on sandy or gravelly soils or on low 'jump-ups' and escarpments (i.e. land zones 5 and 7), within 1 km of a suitable, permanent waterbody (DoEE, 2019p). ***Dispersal habitat:*** This can be any forest or woodland occurring between patches of foraging or breeding habitat, and suitable waterbodies and may include denser patches of vegetation not suitable for foraging or breeding (DoEE, 2019p). ***Nearest record:*** There are no Wildlife Online records for this species within 5 km of the project site.	
Western Alaskan Bar-tailed Godwit (*Limosa lapponica baueri)*	V	V	Wildlife Online, PMST	***Distribution:*** The Western Alaskan Bar-tailed Godwit (both subspecies combined) has been recorded in the coastal areas of all Australian states. It is widespread in the Torres Strait and along the east and south-east coasts of Queensland, NSW and Victoria. In Tasmania, the bar-tailed godwit has mostly been recorded on the south-east coast. In South Australia it has mostly been recorded around coasts from Lake Alexandrina to Denial Bay. In Western Australia it is widespread around the coast, from Eyre to Derby (TSSC, 2016b). ***General habitat preferences:*** The bar-tailed godwit (western Alaskan) occurs mainly in coastal habitats such as	**High:** There are numerous records for this species within 5 km of the project site. Coastal wetland habitat within the project provide potential forage and roosting habitat for this species. This species was not recorded during field surveys within the project site (Duke Environmental, 2016b; Ecological Survey & Management, 2019)

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It has also been recorded in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats (Higgins & Davies 1996). ***Nearest record:*** There are 532 Wildlife Online records within 5 km of the project site.	
Red Goshawk *Erythrotriorchis radiatus*	V	E	PMST	***Distribution:*** This species occurs in a patchy, widespread distribution across coastal and sub-coastal Australia. Historically it occurred from the north-east tip of New South Wales, across Queensland and the Northern Territory, to the north of Western Australia (TSSC, 2015b). ***General habitat preferences:*** This species inhabits tall open forests and woodlands, tropical savannas traversed by wooded or forested rivers, and the edges of rainforests, usually on fertile soils. In partly cleared parts of eastern Queensland it is associated with gorge and escarpment country (TSSC, 2015b). The species avoids both very dense and very open habitats. They are solitary and secretive birds and hunt mainly from ambush. Their prey is mostly birds, but also mammals, reptiles and insects (Marchant & Higgins, 1994). ***Breeding habitat:*** Nests are restricted to trees taller than 20 m and within 1 km of a watercourse or wetland. It is thought to rarely breed in areas with fragmented native vegetation (Garnett et al., 2011). Home ranges of 120 km^2 and 200 km^2 for females and males, respectively have been recorded (Marchant & Higgins, 1994). ***Nearest record:*** There are no published records for this species within 5 km of the project site.	Low: The project site and surrounding area lack extensive intact forested areas preferred by this species.
Grey Falcon *Falco hypoleucos*	V	V	PMST	***Distribution:*** This species occurs in low densities across arid and semi-arid Australia, including the Murray-Darling Basin, Eyre Basin, central Australia and Western Australia	Low: The species is typically associated with more arid areas of Queensland. The species is a rare vagrant closer to the

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				(Marchant S. & Higgins, 1993; TSSC, 2019). The species is mainly found where annual rainfall is less than 500 mm, except when wet years are followed by drought, when the species might become marginally more widespread, although it is essentially confined to the arid and semi-arid zones at all times. In Queensland, the species is generally absent from the Cape York Peninsula and areas east of the Great Dividing Range (TSSC, 2019). ***General habitat preferences:*** The Grey Falcon is typically associated with timbered lowland plains, particularly *Acacia* shrublands that are crossed by tree-lined water courses. The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter (TSSC, 2019). ***Breeding habitat:*** This species breed in old nests of other birds, particularly those of other raptors or corvids. The nests chosen are usually in the tallest trees along watercourses, particularly River Red Gum (*Eucalyptus camaldulensis*) and Coolibah (*E. coolabah*), but falcons also nest in telecommunication towers (TSSC, 2019). ***Nearest record:*** There are no published records for this species within 5 km of the project site.	coast when wet years in arid and semi-arid areas are followed by drought. Furthermore, this species has not been recorded within 5 km of the project site.
Painted Honeyeater *Grantiella picta*	V	V	PMST	***Distribution:*** This species is sparsely distributed from south-eastern Australia to north-western Queensland and eastern Northern Territory. Greatest concentrations, including all breeding records, come from south of 26°, on inland slopes of the Great Dividing Range between the Grampians in Victoria and Roma in Queensland. After breeding, many birds move to semi-arid regions such as north-eastern South Australia, central and western Queensland and central Northern Territory. This species is considered to have a single population (TSSC, 2015a). ***General habitat preferences:*** This species occurs in mistletoes in eucalypt forests, woodlands, riparian	Low: The vegetation on the project site does not support a high abundance of mistletoe and this species has not been recorded within 5 km of the project site.

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia-dominated woodlands, paperbarks, casuarinas, Callitris, and trees on farmland or gardens. Prefers woodlands with a higher number of mature trees, as these generally support more mistletoes. More common in larger remnant tracts, rather than narrow remnant strips (TSSC, 2015a). ***Breeding habitat:*** Breeding season is closely aligned with fruiting of mistletoe, therefore north-south movements have been observed. It has been known to breed in narrow roadside strips if ample mistletoe fruit is present. The species appears to prefer mistletoe as a nest substrate and is likely to be attracted to habitats where mistletoe is prevalent and parasitism rates are high (TSSC, 2015a). ***Nearest record:*** There are no published records for this species within 5 km of the project site.	
White-throated Needletail Hirundapus caudacutus	V	V	PMST, Wildlife Online	***Distribution:*** This species is widespread in eastern and south-eastern Australia, occurring as non-breeding vagrants in the Northern Territory and Western Australia. It occurs in all coastal regions of eastern Queensland and New South Wales, extending inland onto the western slopes of the Great Divide and occasionally on to inland plains (DAWE, 2021). ***General habitat preferences:*** This species is almost exclusively aerial that occurs over forests, woodlands, farmlands, plains, lakes and towns (Pizzey et al., 2012). It is known from above mainly wooded areas, and larger tracts of vegetation, particularly forest. The species roosts in tree hollows in tall trees on ridge-tops, on bark or rock faces and it is thought to have traditional roost sites (DotE, 2015b). Large tracts of native forest vegetation may be considered important in Australia (DotE, 2015b). ***Roosting habitat:*** The species has been recorded roosting in trees in foliage and hollows in forests and woodlands,	**Moderate:** There are a number of nearby records of this species and the project site may provide broadly suitable foraging habitat. This species may therefore overfly the ecology study area as part of a broader foraging range.

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				although this is probably uncommon. It is thought to also roost aerially. They possibly alight or take refuge during adverse conditions (DAWE, 2021). ***Foraging habitat:*** This species forages aerially, from just above the ground to heights up to 'cloud level' over forested and open areas. They have been recorded above disturbed areas, e.g. in the vicinity of bushfires or slashed paddocks, in areas of updraughts or in whirlwinds and often along the edges of low pressure systems (DAWE, 2021). ***Nearest record:*** There are 15 records of this species from within 5 km of the project site.	
South-eastern Glossy Black-Cockatoo *Calyptorhynchus lathami lathami*	V	V	PMST, Wildlife Online	***Distribution:*** This subspecies occurs found from Mitchell, Queensland, through eastern New South Wales to East Gippsland, Victoria. ***Foraging habitat:*** This species occurs in eucalypt woodlands with an understorey or sub-canopy of She-oaks (*Casuarina* or *Allocasuarina* spp.) on the seeds of which its diet is based (Garnett et al., 2011). ***Breeding habitat:*** An obligate hollow nester, Glossy Black-cockatoos require large old trees (living or dead), usually eucalypts, for breeding (Garnett et al., 2011). ***Notable features:*** Glossy black-cockatoo presence can be reliably indicated from foraging signs. Discarded, chewed she-oak seed cones have a characteristic appearance and litter the ground beneath *Casuarina* or *Allocasuarina* trees (Glossy Black Conservancy, 2010). ***Nearest record:*** There is 1 Wildlife Online record within 5 km of the project site.	Low: The site supports a small number of Swamp Oak (*Casuarina glauca*) but lacks the preferred food trees of Black Sheoak (*Allocasuarina littoralis*) and Forest Sheoak (*Allocasuarina torulosa*). The site also supports few hollow bearing trees.
Mammals					
Northern Quoll (*Dasyurus hallucatus*)	E	LC	PMST	***Distribution:*** The Northern Quoll was once widespread in Queensland but has undergone a severe range contraction and is now absent from much of its former range (TSSC, 2005).	Low: The project site is located in an urbanised area. There are no rocky escarpments, rainforest, eucalypt forests and woodlands present.

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				General habitat preferences: This species is usually associated with dissected rocky escarpments but also known from eucalypt forest and woodlands, around human settlement and occasionally rainforest. In the Northern Territory Northern Quoll populations are becoming extinct within one year of the arrival of the Cane Toad (**Rhinella marina*), although in Queensland some remnant quoll populations persist in areas where Cane Toads have long been present (van Dyck & Strahan, 2008). The areas where the quoll persists in Queensland tend to be steep, rocky areas, close to water that have not been recently burnt. They appear to have become extinct in many lowland habitats formerly occupied (Woinarski et al., 2008). ***Breeding habitat:*** Dens are made in rock crevices, tree holes or occasionally termite mounds (TSSC, 2005). Breeding success is higher in animals that have a den near a creek line (van Dyck & Strahan, 2008). ***Nearest record:*** There are no published records for this species within 5 km of the project site.	This distinctive species was not recorded during fauna surveys within the project site (Duke Environmental, 2016b).
Spotted-tailed Quoll (southern subspecies) *Dasyurus maculatus maculatus*	E	E	Wildlife Online, PMST	***Distribution:*** The Spotted-tailed Quoll occurs in south-east Queensland coastally from Bundaberg to the New South Wales border and inland to Monto and Stanthorpe. Occurrences from five broad geographic areas are known with four from coastal ranges and the Great Dividing Range from the NSW border to Gladstone. The fifth is centred on the eastern Darling Downs-Inglewood Sandstone provinces of the Brigalow Belt South Bioregion (DoEE, 2019n). In New South Wales, the Spotted-tailed Quoll records are generally confined to within 200 km of the coast and range from the Queensland border to Kosciuszko NP (DoEE, 2019n). ***General habitat preferences:*** The Spotted-tailed Quoll has been recorded from a wide range of habitats, including: temperate and subtropical rainforests in mountain areas, wet sclerophyll forest, lowland forests, open and closed eucalypt woodlands, inland riparian and River Red Gum	Low: The project site located in an urbanised area and none of the vegetation present is consistent with habitat preferences for this species. This distinctive species was not recorded during fauna surveys within the project site (Duke Environmental, 2016b)

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				(*Eucalyptus camaldulensis*) forests, dry 'rainshadow' woodland, sub-alpine woodlands, coastal heathlands and occasional sightings from open country, grazing lands, rocky outcrops and other treeless areas (DoEE, 2019n). ***Refuge habitat:*** The Spotted-tailed Quoll is predominantly nocturnal and rests during the day in dens. Habitat requirements include suitable den sites such as hollow logs, tree hollows, rock outcrops or caves (DoEE, 2019n). Individuals also require an abundance of food, such as birds and small mammals, and large areas of relatively intact vegetation through which to forage (DoEE, 2019n). ***Nearest record:*** There is 1 record for this species within 5 km of the project site.	
Greater Glider *Petauroides volans*	E	E	PMST	***Distribution:*** This species is restricted to eastern Australia, between Proserpine in north Queensland and Wombat State Forest in central Victoria. It occurs from sea level up to 1,200 m above sea level (DCCEEW, 2022a). ***General habitat preferences:*** The Greater Glider occurs in a range of eucalypt-dominated habitats, including low open forests on the coast to tall forests in the ranges and low woodland westwards of the Dividing Range. It does not use rainforest habitats (van Dyck & Strahan, 2008; van Dyck et al., 2013). This species typically occurs in taller, montane, moist eucalypt forests on fertile soils, with relatively old trees and abundant hollows and a diversity of eucalypt species (DCCEEW, 2022a). ***Foraging habitat:*** The Greater Glider has an almost exclusive diet of eucalypt leaves and occasionally flowers or buds (van Dyck & Strahan, 2008; DCCEEW, 2022a). Although the species is known to feed on a range of eucalypt species, in any particular area it is likely to only forage on one or two species (van Dyck & Strahan, 2008). ***Breeding habitat:*** Breeding occurs between March and June and a single young is born each year (van Dyck &	Low: The project site does not support habitat for this species in the form of complex tall, moist eucalypt forests. The vegetation within the sports complex area is comprised of scattered eucalypts and has been disturbed and altered considerably from previous land use practices. This distinctive species was not recorded during fauna surveys within the project site (Duke Environmental, 2016b)

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				Strahan, 2008; DCCEEW, 2022a). The young stays with the mother or is left in the nest and becomes independent at about 9 months (Menkhorst & Knight, 2011). This species appears to have low dispersal ability and typically small home ranges of 1-4 ha. In lower productivity forests, home ranges may be as large as 19 ha. Male home ranges generally do not overlap (DCCEEW, 2022a). The Greater Glider may glide over distances of up to 100 m. it is a nocturnal species and uses tree hollows during the day to rest (van Dyck & Strahan, 2008). ***Nearest record:*** There are no published records for this species within 5 km of the project site.	
Grey-headed Flying-fox *Pteropus poliocephalus*	V	LC	Wildlife Online, PMST	***Distribution:*** This species is endemic to Australia and occurs in the coastal belt between Rockhampton in central Queensland and Melbourne in Victoria. It infrequently occurs west of the Great Dividing Range. It moves throughout its range in response to availability of foraging resources (DoEE, 2019aa). ***General habitat preferences:*** This species is a canopy-feeding frugivore and nectarivore, usually feeding on rainforest, open forest, closed and open woodland communities as well as Melaleuca swamps and Banksia woodlands. It will also feed on fruit crops and other introduced tree species. Its primary food source is *Eucalyptus* (and related genera) blossom (DoEE, 2019aa). ***Camps:*** Camps are generally in rainforest patches, stands of Melaleuca, mangroves and riparian vegetation located near water, such as lakes, rivers or the coast (DoEE, 2019aa). ***Breeding:*** Mating occurs in early autumn. Young are usually born in October (DoEE, 2019aa). ***Nearest record:*** There are 5 Wildlife Online records for this species within 5 km of the project site.	**High**: The Redcliffe Botanic Gardens, located approximately 7 km north-east of the project site, supports a flying fox camp that is regularly used by Grey-headed Flying-fox (Moreton Bay Regional Council, 2019; DoEE, 2019w). It is therefore highly likely that Grey-headed Flying-fox feed on eucalypts (when in flower) within the site during broader movements throughout the locality. Duke Environmental (2016) recorded flying foxes during nocturnal surveys, but the species was not identified at the time. No roost sites were observed within or adjacent to the site during the site inspection. Further, there are no historic records for roosts within or adjacent to the site.

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
Koala *Phascolarctos cinereus*	E	E	Wildlife Online, PMST	***Distribution:*** This species is widespread in sclerophyll forest and woodlands on foothills and plains on both sides of the Great Dividing Range from about Chillagoe, Queensland to Mt Lofty Ranges in South Australia (Menkhorst & Knight, 2011). In Queensland the species is thought to occur in eight bioregions; Einasleigh Uplands, Wet Tropics, Desert Uplands, Central Mackay Coast, Mitchell Grass Downs, Mulga Lands, Brigalow Belt North and Brigalow Belt South. In many locations Koalas are of low density, widespread and fragmented (DAWE, 2022b). ***Habitat:*** Koalas in Queensland use a range of habitats (typically dominated by *Eucalyptus* species), including moist coastal forests, southern and central western sub-humid woodlands and a number of eucalypt woodlands adjacent to waterbodies in the semi-arid western parts of the state (DAWE, 2022b). These habitats may include forests or woodlands, road-side and rail vegetation and paddock trees with a safe intervening ground matrix for travelling between trees and patches (DAWE, 2022b). The diet of the Koala is highly specialised and relies on species of the *Eucalyptus*, *Corymbia* and *Angophora* genera. While the Koala may use more than 400 species of tree for their food and habitat requirements, preferred tree species will vary by habitat type and location across their range, with primary food species varying in different habits and potentially comprising as few as two species in any given location (DAWE, 2022b). Areas where microclimates provide refuge from heat, and perennial water results in leaf-water content remaining high, e.g. deep gullies, caves, cliffs or dense vegetation, are likely to provide refuge for this species. Climate refugia for this species includes drainage lines, riparian zones and patches that are resilient to drying conditions due to favourable hydrological systems (DAWE, 2022b).	**Present:** A Koala was observed in the north-west portion of the site in July 2022 and potential Koala scats and scratch marks were recorded during the detailed survey of Koala habitat trees within the Stage 2 footprint. Further, data from Koala monitoring in the Griffin area indicates that Koalas are moving through Lot 2 on RP85288 and the project site to gain access to more intact woodland vegetation in the unformed portion of Elizabeth Road and adjoining properties to the north (Hanger et al. 2017; B. Nottidge pers. comm. 2019).

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				Nearest record: There are 3,121 Wildlife Online records for this species within 5 km of the project site and at least 1 records within 1 km of the project site (CSIRO, 2022).	
Large-eared Pied Bat *Chalinolobus dwyeri*	V	V	PMST	***Distribution:*** The species' current distribution is poorly known. Records exist from Shoalwater Bay, north of Rockhampton, Queensland, through to the vicinity of Ulladulla, NSW in the south. Despite the large range, it has been suggested that the species is far more restricted within the species' range than previously understood (DoEE, 2019h). In Queensland, records are known from sandstone escarpments in the Carnarvon, Expedition Ranges and Blackdown Tablelands. Additional records exist in the Scenic Rim near the NSW/Queensland border (DoEE, 2019h). ***General habitat preferences:*** This species is uncommon in dry and wet eucalypt forests from Blackdown Tableland to near Wollongong NSW (Menkhorst & Knight, 2011). It is primarily a cave roosting species that inhabits sclerophyll forests and woodland throughout much of its range (Churchill, 2009). ***Foraging habitat:*** Higher fertility sites, particularly box gum woodlands or river/rainforest corridors are used for foraging (DoEE, 2019h). ***Roosting habitat:*** Sandstone cliffs and fertile woodland valley habitat within close proximity of each other is important roosting habitat for this species. Records from south-east Queensland suggest that rainforest and moist eucalypt forest habitats on other geological substrates (rhyolite, trachyte and basalt) at high elevation are of similar importance to the species are also of importance (DoEE, 2019h). ***Breeding habitat:*** The structure of primary nursery roosts appears to be very specific, i.e. arch caves with dome roofs (that need to be deep enough to allow juvenile bats to learn	Low: The project site does not support suitable habitat resources for this species in the form of dry and wet eucalypt forests, sandstone escarpments and cliffs, box-gum woodlands and river/rainforest corridors.

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				to fly safely inside) and with indentations in the roof, presumably to allow the capture of heat (DoEE, 2019h). These physical characteristics are not very common in the landscape and therefore a limiting factor. No maternity roost sites are known in Queensland (TSSC, 2012). ***Nearest record:*** There are no records for this species within 5 km of the project site.	
Long-nosed Potoroo *Potorous tridactylus tridactylus*	V	V	PMST	***Distribution:*** The Long-nosed Potoroo (SE Mainland) has scattered populations extending from south-eastern Queensland through to NSW. The species has been recorded at Many Peaks Range, south-east of Gladstone, Bellthorpe near Beerwah and in the Border Ranges (DoEE, 2019z). It has also been seen at Bulburin, south-west of Miriam Vale and in the Lamington National Park and surrounds (DoEE, 2019z). ***General habitat preferences:*** There is limited information about the species habitat in Queensland and NSW. There is no consistent pattern to the habitat for this species, it can be found in wet eucalypt forests to coastal heaths and scrubs (DoEE, 2019z). The main factors would appear to be access to some form of dense vegetation for shelter (and the presence of an abundant supply of fungi for food (DoEE, 2019z). ***Nearest record:*** There are no records for this species within 5 km of the project site.	Low: The project site does not support any areas of wet eucalypt forests, coastal heaths and scrubs. Further, given the urbanised nature of the project site, it is unlikely to support an abundance of fungi.
Water Mouse *Xeromys myoides*	V	V	PMST	***Distribution:*** This species occurs in the Northern Territory, central south Queensland and south-east Queensland (DoEE, 2019ah). ***General habitat preferences:*** The species is known to occur in mangroves, saltmarsh, sedgelands, claypans, heathlands and freshwater wetlands. The species has been known to nest or forage in a limited number of REs on land zones 1 and 2 in the Central Queensland Coast, Brigalow	**Moderate:** Coastal wetlands supporting mangrove and saltmarsh communities within the project site have the potential to provide habitat for the Water Mouse. While there are no Wildlife Online records for this species within 5 km of the site, this species is typically associated with coastal wetland habitats similar to that in

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				Belt and South-east Queensland Bioregions (DoEE, 2019ah). ***Breeding habitat:*** The varying vegetation structure at each of their three broad locations dictates their preferred nesting behaviour (DoEE, 2019ah). ***Nearest record***: There are no Wildlife Online records for this species within 5 km of the project site.	the project site and nearby adjoining Hays Inlet Conservation Park. The project site occurs within an area where habitat modelling indicates the species is 'likely to occur' (DoEE, 2019ah). It is noted that adequate surveys to confirm the presence/absence of Water Mouse within the project site have not been conducted.
Ghost Bat *Macroderma gigas*	V	E	PMST	***Distribution:*** It is predicted, based on analysis of historic climatic data, fossils, and modelling that the Ghost Bat is a geographically relictual species in southern, arid landscapes, present only because caves provide suitable roost microclimates (TSSC, 2016a). Although this species is thought to once occupy much of Australia, its current range is discontinuous across northern Australia, with colonies known in the Pilbara, Kimberly, northern Northern Territory, the Gulf of Carpentaria, coastal and near coastal eastern Queensland from Cape York to near Rockhampton and the Riversleigh and Cammoweal districts in western Queensland and occupying both arid and lush rainforest habitats (TSSC, 2016a; van Dyck & Strahan, 2008). ***General habitat preferences:*** Habitat is comprised of thicket, open woodland, and spinifex and black soil grasslands (van Dyck & Strahan, 2008; van Dyck et al., 2013). Monsoon forests, open savannah woodland, tall open forest, deciduous vine forest and tropical rainforest is also used (Churchill, 2009). Cave habitat is important for roosting and breeding (van Dyck & Strahan, 2008). Ghost bats usually require a number caves to move between seasonally (TSSC, 2016a). ***Foraging habitat:*** This species feeds on frogs, lizards, birds, small mammals and sometimes other bats (van Dyck & Strahan, 2008; TSSC, 2016a). It captures prey on the ground and then returns to an established feeding site, e.g. rock overhang or small cave, to feed (van Dyck & Strahan,	Low: The project site does not support preferred habitat for this species in the form of mountainous cave and escarpment features.

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				2008). It is known to forage up to 2 km from the roost cave and will use the same foraging area each night. Foraging areas are approximately 60 ha in size (Churchill, 2009; TSSC, 2016a). ***Roosting habitat:*** Caves provide suitable roost microclimates and it is known to rest during the day in large sandstone or limestone caves, boulder piles, shallow escarpments or deep rock fissures and mines (TSSC, 2016a; van Dyck & Strahan, 2008; Churchill, 2009). This species appears to require caves with specific temperature and humidity ranges (TSSC, 2016a). Groups of greater than 100 individuals is unusual (van Dyck & Strahan, 2008). ***Breeding habitat:*** Breeding is likely to occur in July or August with young being born between September and November. Nursery colonies are formed separately to males (van Dyck & Strahan, 2008). Only 14 breeding sites are currently known (TSSC, 2016a). Young are fully weaned by about March each year but may be left in nurseries or forage with the mother up until this age (Churchill, 2009). There is a tendency for breeding caves to have multiple entrances (TSSC, 2016a). ***Nearest record:*** There are no published records for this species within 5 km of the project site.	
Yellow-bellied Glider (south-eastern) *Petaurus australis australis*	V	V	PMST	***Distribution:*** The Yellow-bellied Glider (south-eastern) has a widespread but patchy distribution from south-eastern Queensland to far south-eastern South Australia from altitudes from sea level to 1,400 m elevation. In Queensland the species occurs along the eastern seaboard from north of Mackay to the NSW border with isolated sub-populations occurring in the Blackdown and Carnarvon Ranges (DAWE, 2022a). ***Habitat Preferences:***	

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				The Yellow-bellied Glider (south-eastern) occurs in eucalypt woodlands and forests including dry and wet sclerophyll forests with the species preferring large patches of mature old growth forest. The species has very low dispersal capacity over distances greater than its gliding distance which is a maximum of 120 to 140 m. The subspecies is social and lives in small family groups of two to six individuals of varying age and sex composition, throughout a home range of approximately 50–65 ha (plausible range 25–85 ha). The Yellow-bellied Glider (south-eastern) shelter in hollows of large trees usually more than a 1 m in diameter and rarely uses stags with dead trees accounting for only two percent of den trees in certain forest types (DAWE, 2022a). ***Nearest record:*** There are no published records for this species within 5 km of the project site.	
Reptiles					
Collared Delma *Delma torquata*	V	V	PMST	***Distribution***: The species has been recorded within the Bunya Mountains (approximately 200 km north-west of Brisbane), Blackdown Tablelands National Park (approximately 200 km west of Rockhampton), Expedition National Park (Central Queensland), Western Creek, near Millmerran (approximately 200 km south-west of Brisbane) and the Toowoomba Range. A large concentration of records are from the western suburbs of Brisbane (DoEE, 2019o). ***General habitat preferences:*** This species is predominantly associated with open rocky terrain although it has also been found in eucalypt woodlands and brigalow with little surface rock (Wilson, 2005). It is most likely to inhabit eucalypt-dominated woodland and open forests on landzones 3, 9 and 10. The presence of rocks, logs, bark and other coarse woody debris, and mats of leaf litter typically 30-100 mm thick) appear to be essential	Low: Eucalypt woodland within the site lacks microhabitat features that are preferred by this species such as rocks, logs, coarse woody debris and mats of leaf litter.

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				characteristics of Collared Delma microhabitat, which may be a limiting factor for recolonising recently burnt areas (DoEE, 2019o). This species has been found in only a hand full of small isolated populations in South East Queensland and the Brigalow Belt bioregions (DoEE, 2019o). ***Nearest record*:** There are no records for this species within 5 km of the project site.	
Three-toed Snake-tooth Skink *Saiphos reticulatus*	V	LC	PMST	***Distribution:*** The Three-toed Snake-tooth Skink occurs from Crescent Head in north-east NSW to Fraser Island in south-east Queensland. Most records are from the Border Ranges in the vicinity of the NSW/Queensland border (DoEE, 2019ac). ***General habitat preferences:*** In Queensland, the Three-toed Snake-tooth Skink has been recorded in rainforest, closed forest, wet sclerophyll forest, tall open Blackbutt (*Eucalyptus pilularis*) forest, tall layered open eucalypt forest and closed Brush Box (*Lophostemon confertus*) forest (DoEE, 2019ac). It has also been recorded from extensive regrowth in heavily logged areas (DoEE, 2019ac). ***Foraging habitat:*** This species feeds on worms, insects and insect larvae (DoEE, 2019ac). ***Breeding habitat:*** There is no life cycle information available for this species. ***Notable features:*** The Three-toed Snake-tooth Skink can be easily distinguished from most other skinks by its reduced limbs, three toes per limb, robust shape and, in most instances, distinctive body markings (especially in juveniles) (DoEE, 2019ac). ***Nearest record:*** There are no Wildlife Online records for this species within 5 km of the project site.	Low: The project site does not support any rainforest, closed forest, tall open Blackbutt forest or closed Brush Box forest that are preferred by this species.
Insects					

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
Australian Fritillary *Argynnis hyperbius inconstans*	CE	E	PMST	***Distribution:*** The Australian Fritillary appears to have a core distribution between Gympie and Port Macquarie although historical records extend as far north as Mt Bellenden Ker south of Cairns. The species is restricted to areas where its larval food plant, the Arrowhead Violet (*Viola betonicifolia*) occurs. The Arrowhead Violet is widespread at both low and high altitudes although the Australian Fritillary appears to only occur at sites below 600 m elevation (TSSC, 2017). One of the last reliable sightings was in 2001 near Port Macquarie and another near Caboolture also at this time, with several unconfirmed sightings since this time. Targeted surveys have repeatedly failed to detect the species. ***Habitat preferences:*** The Australian Fritillary usually occurs around river estuaries or open, swampy coastal regions. In the wild the species is believed to be host specific and only occurs in areas where Arrowhead Violet occurs. The Arrowhead Violet occurs in damp niches in open habitats beneath grasses and other plants often occurring in association with Long-leaved Matrush (*Lomandra longifolia*) and Blady Grass (*Imperata cylindrica*). The arrowhead violet has declined in abundance due to weed invasion (mostly exotic grasses). ***Nearest record:*** There are no Wildlife Online records for this species within 5 km of the project site.	Low: The host plant, Arrowhead Violet has not been recorded on the site and there are no Wildlife Online records for this species within 5 km of the project site.
Pink Underwing Moth *Phyllodes imperialis smithersi*	E	LC	PMST	***Distribution:*** The Pink Underwing Moth (southern) occurs from Nambour in Queensland to Dorrigo in northern New South Wales. It is currently known from five locations of which Mary Cairncross Scenic Reserve near Maleny is the only confirmed breeding habitat (DEWHA, 2008b). ***Habitat preferences:*** The Pink Underwing Moth occurs in undisturbed subtropical rainforest below 600 m altitude in association with the vine *Carronia multisepalea*. The moth only occurs where the vine occurs as a collapsed shrub and	Low: The project site does not support subtropical rainforest or the host plant of this species.

Common name/ Species name	Status[1]		Record source[2]	Habitat preferences	Likelihood to occur
	EPBC Act	NC Act			
				does not occur where it has an upright form (DEWHA, 2008b). ***Nearest record:*** There are no Wildlife Online records for this species within 5 km of the project site.	

[1]Status:
- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*: CE = Critically endangered, E = Endangered; V = Vulnerable
- Queensland *Nature Conservation Act 1992*: E = Endangered; V = Vulnerable; LC = Least concern

[2] - PMST – Protected Matters Search Tool (refer to PMST database results contained in Appendix B)

Note: Fish, seabirds and other aquatic marine species (i.e. sharks and turtles) have not been considered as part of this assessment as the site does not support oceanic aquatic habitats.

Appendix D

Koala movement data (Hanger et al., 2017)

Images provided B. Nottidge (co-author)

Plate D1. 'Pistachio' movement data (● project site)

Plate D2. 'Gonzo' movement data (● project site)

Plate D3. 'Pistachio' and 'Gonzo' records within and adjacent to GSC

Appendix E

Project site photographs

Plate E1. Koala habitat within Stage 2 footprint (central area looking north-west)

Plate E2. Koala habitat in Stage 2 footprint (eastern edge, looking south-west).

Plate E3. Koala habitat to the north of the project site

Plate E4. Koala habitat to north of project site

Plate E5. Koala habitat in south-west portion of project site to be retained.

Plate E6. Potential Koala scats recorded in Stage 2 footprint.

Plate E7. Coastal wetlands within the eastern portion of the project site.

Plate E8. Coastal wetlands within the south-western portion of the project site.

Appendix F

Koala habitat tree details

Table F1: Details of Koala habitat trees within and adjacent to the project footprint

Tree No.	Scientific name	Common name	DBH (mm)	Height (m)	Comments	Status
1	*Eucalyptus tereticornis*	Queensland Blue Gum	550	15.0		Remove
2	*Eucalyptus tereticornis*	Queensland Blue Gum	460	16.2	Poor canopy health, stick nest present	Remove
3	*Eucalyptus tereticornis*	Queensland Blue Gum	460	16.0	Scratches and scats present - possum?	Remove
4	*Eucalyptus tereticornis*	Queensland Blue Gum	390	12.4	Scratches and scats present - possum?	Remove
5	*Eucalyptus tereticornis*	Queensland Blue Gum	530	13.6	Scratches and scats present - possum?	Remove
6	*Eucalyptus tereticornis*	Queensland Blue Gum	566	21.0	Dual-leadered, possum scratches and scats (flat edge)	Remove
7	*Eucalyptus tereticornis*	Stag	690	15.8	No hollows	Remove
8	*Eucalyptus tereticornis*	Queensland Blue Gum	680	14.6		Remove
9	*Eucalyptus tereticornis*	Queensland Blue Gum	595	7.6	Tri-leadered, old stump with regrowth	Remove
10	*Eucalyptus tereticornis*	Queensland Blue Gum	643	15.8	Dual-leadered, possum scratches and scats (flat edge)	Remove
11	*Eucalyptus tereticornis*	Queensland Blue Gum	580	20.0	Poor canopy health, scratches and scats present - possum?	Remove
12	*Eucalyptus tereticornis*	Queensland Blue Gum	600	19.0	Poor canopy health	Remove
13	*Eucalyptus tereticornis*	Queensland Blue Gum	640	14.6	Scratches - possum?, no scats	Remove
14	*Eucalyptus tereticornis*	Queensland Blue Gum	585	15.8	Scratches - possum?, no scats	Remove
15	*Eucalyptus tereticornis*	Queensland Blue Gum	450	15.6	Very poor canopy health, scratches - possum?, no scats	Remove
16	*Eucalyptus tereticornis*	Queensland Blue Gum	730	17.0	Scratches and scats - Koala?	Remove

Tree No.	Scientific name	Common name	DBH (mm)	Height (m)	Comments	Status
17	*Eucalyptus tereticornis*	Queensland Blue Gum	670	16.0	Immature	Remove
18	*Eucalyptus tereticornis*	Queensland Blue Gum	206	4.6	Immature	Remove
19	*Eucalyptus tereticornis*	Queensland Blue Gum	140	4.5	Immature	Remove
20	*Eucalyptus tereticornis*	Queensland Blue Gum	130	5.4	Immature	Remove
21	*Eucalyptus tereticornis*	Queensland Blue Gum	90	5.3	Immature	Remove
22	*Eucalyptus tereticornis*	Queensland Blue Gum	140	14.2	Large hollow spout at base of main trunk,	Remove
23	*Eucalyptus tereticornis*	Queensland Blue Gum	910	9.8	Stag	Remove
24	*Eucalyptus tereticornis*	Queensland Blue Gum	180	5.6	Immature	Remove
25	*Eucalyptus tereticornis*	Queensland Blue Gum	133	12.2	Main trunk dead and hollow, regenerating leaders	Remove
26	*Eucalyptus tereticornis*	Queensland Blue Gum	440	13.6	Scratches and scats present - possum?	Remove
27	*Eucalyptus tereticornis*	Queensland Blue Gum	380	13.4	Scratches and scats present - possum?	Remove
28	*Eucalyptus tereticornis*	Queensland Blue Gum	150	5.0	Almost dead, smothered by Monkey Rope Vine	Remove
29	*Eucalyptus tereticornis*	Queensland Blue Gum	700	14.6	Twin-leadered, poor canopy health, scratches - possum?	Remove
30	*Eucalyptus tereticornis*	Queensland Blue Gum	700	16.4	Poor canopy health, scratches - possum?	Remove
31	*Eucalyptus tereticornis*	Queensland Blue Gum	660	21.4	Scratches and scats present - possum?	Remove
32	*Eucalyptus tereticornis*	Queensland Blue Gum	590	19	Scratches and scats present - possum?	Remove
33	*Eucalyptus tereticornis*	Queensland Blue Gum	680	19.2	Scratches - Koala? Scats - possum (flat edge)?	Remove

Tree No.	Scientific name	Common name	DBH (mm)	Height (m)	Comments	Status
34	*Eucalyptus tereticornis*	Queensland Blue Gum	440	13.0	Scratches and scats present - possum?	Remove
35	*Eucalyptus tereticornis*	Queensland Blue Gum	658	14.0	Scratches and scats present - possum?	Remove
36	*Eucalyptus tereticornis*	Queensland Blue Gum	290	12.6	Poor canopy health, scratches and scats present - possum?	Remove
37	*Eucalyptus tereticornis*	Queensland Blue Gum	467	16.6	Scratches and scats present - possum?	Remove
38	*Eucalyptus tereticornis*	Queensland Blue Gum	500	14.2	Scratches and scats present - possum?	Remove
39	*Eucalyptus tereticornis*	Queensland Blue Gum	410	11.4	Scratches and scats present - possum?	Remove
40	*Eucalyptus tereticornis*	Queensland Blue Gum	370	11.4	Scratches and scats present - possum?	Remove
41	*Eucalyptus tereticornis*	Queensland Blue Gum	260	12.6	Scratches and scats present - possum?	Remove
42	*Eucalyptus tereticornis*	Queensland Blue Gum	280	11.8	Scratches and scats present - possum?	Remove
43	*Eucalyptus tereticornis*	Queensland Blue Gum	660	19.0	Scratches and scats present - possum? One small hollow, 10cm diameter	Remove
44	*Eucalyptus tereticornis*	Queensland Blue Gum	750	19.0	Scratches and scats present - possum?	Remove
45	*Eucalyptus tereticornis*	Queensland Blue Gum	360	14	Scratches and scats present - possum?	Remove
46	*Eucalyptus tereticornis*	Queensland Blue Gum	680	18.2	Scratches and scats present - possum? One small hollow, 10cm diameter	Remove
47	*Eucalyptus tereticornis*	Queensland Blue Gum	740	19.0	Scratches and scats present - possum? One small hollow, 10cm diameter	Remove
48	*Eucalyptus tereticornis*	Queensland Blue Gum	580	10.6	Scratches and scats present - possum? Stick nest	Remove
49	*Eucalyptus tereticornis*	Queensland Blue Gum	360	8.0	Scratches and scats present - possum? Hollow at base	Remove
50	*Eucalyptus tereticornis*	Queensland Blue Gum	120	4.6	Immature	Remove

Tree No.	Scientific name	Common name	DBH (mm)	Height (m)	Comments	Status
51	*Eucalyptus tereticornis*	Queensland Blue Gum	120	4.4	Immature	Remove
52	*Eucalyptus tereticornis*	Queensland Blue Gum	174	4.4	Immature, tri-leadered	Remove
53	*Eucalyptus tereticornis*	Queensland Blue Gum	90	4.4	Immature	Remove
54	*Eucalyptus tereticornis*	Queensland Blue Gum	80	9.4	Immature	Remove
55	*Eucalyptus tereticornis*	Queensland Blue Gum	140	5.0	Immature	Remove
56	*Eucalyptus tereticornis*	Queensland Blue Gum	110	4.8	Immature	Remove
57	*Eucalyptus tereticornis*	Queensland Blue Gum	130	5.2	Immature	Remove
58	*Eucalyptus tereticornis*	Queensland Blue Gum	850	18.6	Scratches and scats present - possum?	Remove
59	*Eucalyptus tereticornis*	Queensland Blue Gum	800	20.6	Scratches and scats present - possum?	Remove
60	*Eucalyptus tereticornis*	Queensland Blue Gum	170	6.6	Immature	Remove
61	*Eucalyptus tereticornis*	Queensland Blue Gum	630	17.0	Scratches and scats present - possum?	Remove
62	*Eucalyptus tereticornis*	Queensland Blue Gum	110	5.4	Immature	Remove
63	*Eucalyptus tereticornis*	Queensland Blue Gum	191	4.8	Immature, tri-leadered	Remove
64	*Eucalyptus tereticornis*	Queensland Blue Gum	630	16	Scratches - possum? No scats	Remove
65	*Eucalyptus tereticornis*	Queensland Blue Gum	100	5.2	Immature	Remove
66	*Eucalyptus tereticornis*	Queensland Blue Gum	140	8.6	Immature	Remove
67	*Eucalyptus tereticornis*	Queensland Blue Gum	900	17.8	Scratches - Koala? No scats	Remove

Tree No.	Scientific name	Common name	DBH (mm)	Height (m)	Comments	Status
68	*Eucalyptus tereticornis*	Queensland Blue Gum	1135	20.4	Tri-leadered, scratches and scats present - possum?	Remove
69	*Eucalyptus tereticornis*	Queensland Blue Gum	550	15.4	Scratches and scats present - possum?	Remove
70	*Eucalyptus tereticornis*	Queensland Blue Gum	630	16.2	Scratches and scats present - possum?	Remove
71	*Eucalyptus tereticornis*	Queensland Blue Gum	590	16.4	Scratches and scats present - possum?	Remove
72	*Eucalyptus tereticornis*	Queensland Blue Gum	610	17.0	Scratches and scats present - possum?	Remove
73	*Melaleuca quinquenervia*	Broad-leaved Paperbark	400	11.0	Dense Common Lantana around base	Remove
74	Stag	Queensland Blue Gum	400	14.0	Stag, no hollows	Remove
75	*Eucalyptus tereticornis*	Queensland Blue Gum	470	14.6	Scratches and scats present - possum?	Remove
76	*Eucalyptus tereticornis*	Queensland Blue Gum	480	15.4	Scratches and scats present - possum?	Remove
77	*Eucalyptus tereticornis*	Queensland Blue Gum	450	15.0	Scratches and scats present - possum?	Remove
78	*Eucalyptus tereticornis*	Queensland Blue Gum	100	4.0	Immature	Remove
79	*Melaleuca quinquenervia*	Broad-leaved Paperbark	520	8.0	-	Remove
80	*Eucalyptus tereticornis*	Queensland Blue Gum	360.0	16.8	Poor canopy health, scratches - possum?, no scats	Remove
81	*Eucalyptus tereticornis*	Queensland Blue Gum	417	16.0	Scratches - possum?, no scats	Remove
82	*Eucalyptus tereticornis*	Queensland Blue Gum	400	15.0		Remove
83	*Eucalyptus tereticornis*	Queensland Blue Gum	350	15.4	Scratches - possum? No scats	Remove
84	*Eucalyptus tereticornis*	Queensland Blue Gum	300	14.4	Scratches - possum? No scats	Remove

Tree No.	Scientific name	Common name	DBH (mm)	Height (m)	Comments	Status
85	*Eucalyptus tereticornis*	Queensland Blue Gum	260	14.4	Scratches - possum? No scats	Remove
86	*Eucalyptus tereticornis*	Queensland Blue Gum	260	13.0	Scratches - possum? No scats	Remove
87	*Eucalyptus tereticornis*	Queensland Blue Gum	360	16.8	Scratches - possum? No scats	Remove
88	*Eucalyptus tereticornis*	Queensland Blue Gum	340	14.0	Scratches - possum? No scats	Remove
89	*Eucalyptus tereticornis*	Queensland Blue Gum	350	10.4	Scratches - possum? No scats	Remove
90	*Eucalyptus tereticornis*	Queensland Blue Gum	460	14.8	Scratches - possum? No scats	Remove
91	*Eucalyptus tereticornis*	Queensland Blue Gum	566	15.4	Scratches - possum? No scats	Remove
92	*Eucalyptus tereticornis*	Queensland Blue Gum	820	15.6	Scratches - possum? No scats	Remove
93	*Eucalyptus tereticornis*	Queensland Blue Gum	480	10.2	Scratches - possum? No scats	Remove
94	*Eucalyptus tereticornis*	Queensland Blue Gum	580	19.2	Scratches - possum? No scats	Remove
95	*Eucalyptus tereticornis*	Queensland Blue Gum	410	15.8	Scratches - possum? No scats	Remove
96	*Eucalyptus tereticornis*	Queensland Blue Gum	280	15.0	Scratches and scats present - possum?	Remove
97	*Eucalyptus tereticornis*	Queensland Blue Gum	340	16.4	Scratches and scats present - possum?	Remove
98	*Eucalyptus tereticornis*	Queensland Blue Gum	340	17.6	Scratches - possum? No scats	Remove
99	*Eucalyptus tereticornis*	Queensland Blue Gum	300	19.0	Scratches - possum? No scats	Remove
100	*Eucalyptus tereticornis*	Queensland Blue Gum	300	19.0	Scratches - possum? No scats	Remove
101	*Eucalyptus tereticornis*	Queensland Blue Gum	390	18.0	Scratches and scats present - possum?	Remove

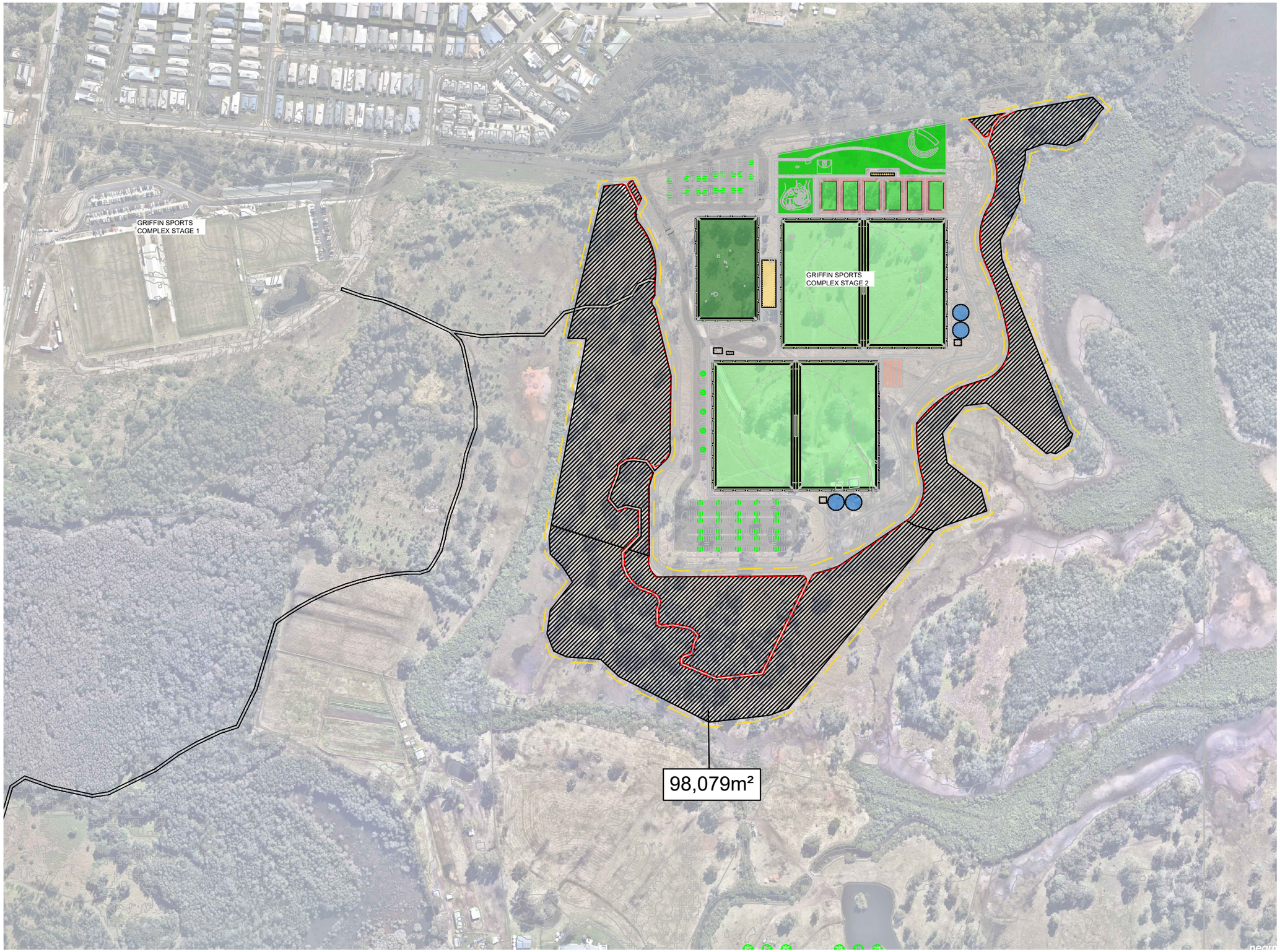
Tree No.	Scientific name	Common name	DBH (mm)	Height (m)	Comments	Status
102	*Eucalyptus tereticornis*	Queensland Blue Gum	290	15.2	Scratches and scats present - possum?	Remove
103	*Eucalyptus tereticornis*	Queensland Blue Gum	600	14.2	Scratches and scats present - possum?	Remove
104	*Eucalyptus tereticornis*	Queensland Blue Gum	1100	18.4	Scratches and scats present - possum?	Remove
105	*Eucalyptus tereticornis*	Queensland Blue Gum	793	15.2	Scratches and scats present - possum?	Remove
106	*Eucalyptus tereticornis*	Queensland Blue Gum	310	12.00	Poor canopy health, scratches and scats present - possum?	Remove
107	*Eucalyptus tereticornis*	Queensland Blue Gum	380	11.6	Poor canopy health, scratches - possum? No scats	Remove
108	*Eucalyptus tereticornis*	Queensland Blue Gum	210	6.6	Scratches - possum? No scats	Remove
109	*Eucalyptus tereticornis*	Queensland Blue Gum	410	15.6	Scratches - possum? No scats	Remove
110	*Eucalyptus tereticornis*	Queensland Blue Gum	340	10.8	Poor canopy health, scratches - possum? No scats	Remove
111	*Eucalyptus tereticornis*	Queensland Blue Gum	660	18.00	Poor canopy health, scratches ands scats - Koala?	Remove
112	*Eucalyptus tereticornis*	Queensland Blue Gum	340	14.0	Scratches - possum? No scats	Remove
113	*Eucalyptus tereticornis*	Queensland Blue Gum	390	15.0	Scratches and scats present - possum?	Remove
114	*Eucalyptus tereticornis*	Queensland Blue Gum	240	10.4	Scratches and scats present - possum?	Remove
115	*Eucalyptus tereticornis*	Queensland Blue Gum	680	16.0	Scratches and scats present - possum?	Remove
116	*Eucalyptus tereticornis*	Queensland Blue Gum	500	13.6	Very poor canopy health, scratches and scats present - possum?	Remove
117	*Eucalyptus tereticornis*	Queensland Blue Gum	440	14.0	Scratches and scats present - possum?	Remove
118	*Eucalyptus tereticornis*	Queensland Blue Gum	300	13.8	Scratches and scats present - possum?	Remove

Tree No.	Scientific name	Common name	DBH (mm)	Height (m)	Comments	Status
119	*Eucalyptus tereticornis*	Queensland Blue Gum	350	15.2	Scratches and scats present - possum?	Remove
120	*Eucalyptus tereticornis*	Queensland Blue Gum	380	13.2	Scratches - possum? No scats	Remove
121	*Eucalyptus tereticornis*	Queensland Blue Gum	300	13.2	Scratches - possum? No scats	Remove
122	*Eucalyptus tereticornis*	Queensland Blue Gum	190	13.2	Scratches - possum? No scats	Remove
123	*Eucalyptus tereticornis*	Queensland Blue Gum	370	13.8	Scratches - possum? No scats	Remove
124	*Eucalyptus tereticornis*	Queensland Blue Gum	440	13.8	Scratches - possum? No scats	Remove
125	*Eucalyptus tereticornis*	Queensland Blue Gum	370	14.0	Scratches - possum? No scats	Remove
126	*Eucalyptus tereticornis*	Queensland Blue Gum	230	9.8	Scratches - possum? No scats	Remove
127	*Eucalyptus tereticornis*	Queensland Blue Gum	310	11.4	Scratches and scats present - possum?	Remove
128	*Eucalyptus tereticornis*	Queensland Blue Gum	810	18.6	Scratches and scats present - possum?	Remove
129	*Eucalyptus siderophoia*	Northern Grey Ironbark	400	13.2	Scratches - possum? No scats	Retain
130	*Eucalyptus siderophoia*	Northern Grey Ironbark	530	15.8	Scratches - possum? No scats	Retain
131	*Eucalyptus tereticornis*	Queensland Blue Gum	500	20.0	Scratches and scats present - possum?	Retain
132	*Eucalyptus tereticornis*	Queensland Blue Gum	751	17.4	Scratches - possum? No scats. Half dead trunk, possibly hollow	Retain
133	*Eucalyptus tereticornis*	Queensland Blue Gum	410	16.4	Scratches - possum? No scats	Retain
134	*Eucalyptus tereticornis*	Queensland Blue Gum	220	12.0	Scratches - possum? No scats	Retain
135	*Eucalyptus tereticornis*	Queensland Blue Gum	490	15.0	Scratches and scats present - possum?	Retain

Tree No.	Scientific name	Common name	DBH (mm)	Height (m)	Comments	Status
136	*Eucalyptus tereticornis*	Queensland Blue Gum	590	18.0	Scratches and scats present - possum?	Retain
137	*Eucalyptus tereticornis*	Queensland Blue Gum	856	16.0	Scratches - possum? No scats	Remove
138	*Eucalyptus tereticornis*	Queensland Blue Gum	608	15.0	Scratches and scats present - possum?	Remove
139	*Eucalyptus tereticornis*	Queensland Blue Gum	650	19.2	Scratches and scats present - possum?	Remove
140	*Eucalyptus tereticornis*	Queensland Blue Gum	590	20.2	Scratches and scats present - possum?	Remove
141	*Eucalyptus tereticornis*	Queensland Blue Gum	680	15.4	Scratches and scats present - possum?	Retain
142	*Eucalyptus tereticornis*	Queensland Blue Gum	510	16.6	Scratches and scats present - possum?	Remove
143	*Eucalyptus tereticornis*	Queensland Blue Gum	610	19.0	Scratches and scats present - possum?	Retain
144	*Eucalyptus tereticornis*	Queensland Blue Gum	460	11.8		Remove
145	*Eucalyptus tereticornis*	Queensland Blue Gum	380	16.6		Remove
146	*Eucalyptus tereticornis*	Queensland Blue Gum	450	14.8		Remove
147	*Eucalyptus tereticornis*	Queensland Blue Gum	360	12.0		Retain
148	*Eucalyptus tereticornis*	Queensland Blue Gum	580	14.0		Retain
149	*Corymbia intermedia*	Pink Bloodwood	300	14.0		Retain
150	*Lophostemon suaveolens*	Swamp Box	300	14.0		Retain

Appendix G

Proposed revegetation details



Moreton Bay Regional Council

AUTHORISATION

Delivery Manager — Date

RPEQ — Date

Project Owner / Manager — Date

Program Responsible Officer — Date

PROJECT INFORMATION

Project Number: 101166

JS	JC
Coordinator	Team Leader
KM	VM
Designer	Checked
Surveyor	Survey Date / Ref. No.

Survey Datum

MGA (GDA 94) Zone 56 SF 0.9996	AHD
Horizontal	Vertical

0m 20 40 60 80 — 1:2000 AT A1, 1:4000 AT A3

Scales

ISSUE

Revisions

Original Issue — Date: 11/2022

PROJECT DESCRIPTION

GRIFFIN SPORTS COMPLEX, ELIZABETH ROAD, GRIFFIN

SPORTING COMPLEX DEVELOPMENT STAGE 2

RESTORATION PLANTING PLAN

DRAWING NUMBER

001

Drawing Number — Rev.

Drawing 1 of 2 | Original Plan Size A1

PLANT SCHEDULE

TREES

CODE	BOTANICAL NAME	COMMON NAME	SIZE	DENSITY	QTY
EUC res	*Eucalyptus resinifera*	Red Mahogany	TUBE	15% of area 1/8m^2	450
EUC sid	*Eucalyptus siderophloia*	Northern Grey Ironbark	TUBE	15% of area 1/8m^2	450
EUC ter	*Eucalyptus tereticornis*	Queensland BLue Gum	TUBE	60% of area 1/8m^2	1,800
MEL qui	*Melaleuca quinquenervia*	Broad Leaved Paperbark	TUBE	10% of area 1/8m^2	300
				TOTAL	3000

SHRUBS / SMALL TREES

ACA con	*Acacia concurrens*	Black Wattle	TUBE	
ACA dis	*Acacia disparrima*	Southern Salwood	TUBE	
ACA lei	*Acacia leiocalyx*	Early Flowering Black Wattle	TUBE	
ACA mel	*Acacia melanoxylon*	Australian Blackwood	TUBE	
BAN int	*Banksia integrifolia*	Coastal Banksia	TUBE	
BRE obl	*Breynia oblongifolia*	Coffee Bush	TUBE	
BUR spi	Bursaria spinosa	Black Thorn	TUBE	
DOD tri	Dodonaea triquestra	Common Hop Bush	TUBE	
HOV acu	Hovea acutifolia	Pointed Leaf Hovea	TUBE	
JAC sco	Jacksonia scoparia	Dogwood	TUBE	
LEP pol	Leptospermum polygalifolium	Yellow Tea Tree	TUBE	
PUL vil	Pultenaea villosa	Hairy Bush-Pea	TUBE	
TRE tom	Trema tomentosa	Native Peach	TUBE	

GROUNDCOVERS / GRASSES / VINES

ALL sem	*Alloteropsis semialata*	Cockatoo Grass	TUBE	
CAP spi	*Capillipedium spicigerum*	Scented-Top Grass	TUBE	
CYM ref	*Cymbopogon refractus*	Barbed Wire Grass	TUBE	
DIA bre	*Dianella brevipedunculata*	Blue Flax Lily	TUBE	
EUS lat	*Eustrephus latifolia*	Wombat Berry	TUBE	
GOO rot	*Goodenia rotundifolia*	Star Goodenia	TUBE	
HIB ves	*Hibbertia vestita*	Hairy Guinea-Flower	TUBE	
IMP cyl	*Imperata cylindrica*	Blady Grass	TUBE	
LOM lon	*Lomandra longifolia*	Spiny-Head Mat-Rush	TUBE	
OTT gra	*Ottochloa gracillima*	Pademelon Grass	TUBE	
SMI aus	*Smilax australis*	Barbed-wire Vine	TUBE	
THE tri	*Themeda triandra*	Kangaroo Grass	TUBE	

Edge Planting

CAP spi	*Capillipedium spicigerum*	Scented-Top Grass	TUBE	
CYM ref	*Cymbopogon refractus*	Barbed Wire Grass	TUBE	
IMP cyl	*Imperata cylindrica*	Blady Grass	TUBE	
LOM hys	*Lomandra hystrix*	Mat-Rush	TUBE	
THE tri	*Themeda triandra*	Kangaroo Grass	TUBE	

LEGEND

- PLANTING ZONE: OFFSET PLANTING IN GRASSED / PARTIALLY-VEGETATED AREAS. ASSISTED NATURAL REGENERATION INCLUDING WEED MANAGEMENT, INFILL PLANTING & DENSE EDGE PLANTING
- EXTENT OF WORKS
- MBRC CADASTRAL BOUNDARIES
- 11.75 EXISTING CONTOURS
- W EXISTING WATER LINE
- SWD EXISTING STORMWATER LINE
- S EXISTING SEWER LINE
- EDGE PLANTING (1M WIDE)

VEGETATION AREA

DESCRIPTION OF AREA

THE EXTENT OF THE SITE AT THE SOUTHERN END IS DEFINED BY WETLAND. THE NORTHERN BOUNDARY OF THE SITE IS DEFINED BY ELIZABETH ROAD. THE WESTERN BOUNDARIE OF THE SITE ARE DEFINED BY THE GRIFFIN SPORTS COMPLEX AND SPORTING FIELDS.

THE RESTORATION AIMS TO:

- IMPROVE AND INCREASE FAUNA HABITAT PRIMARILY KOALAS WITHIN THE PRECINCT.
- IMPROVE THE STABILITY OF THE SITE BY INCREASING THE HEALTH, STRUCTURE AND DIVERSITY OF NATIVE VEGETATION;
- IMPROVE THE RESILIENCE AND AESTHETICS OF THE AREA BY CONTROLLING WEEDS AND ASSISTING THE RECOVERY OF NATIVE VEGETATION; AND
- REMOVING WEED TREES.

RESTORATION APPROACH

THE SITE IS TO BE RESTORED BY EMPLOYING THE ASSISTED REGENERATION METHODOLOGY INVOLVING MAINLY WEED CONTROL WITH SOME PLANTING. THE SITE AS SHOWN ON THE PLAN HAS BEEN IDENTIFIED FOR PLANTING TO ACCELERATE THE RECOVERY PROCESS AND ASSIST IN STABILISING ERODING AREAS.

WEED REMOVAL: PRIMARY WORKS ARE TO START WITH THE REMOVAL OF WOODY VINES AND WEEDS < 5m BEFORE CARRYING OUT INITIAL SPRAY WORK TO CONTROL HERBACEOUS WEEDS.

PLANTING: PLANTING ZONES HAVE BEEN IDENTIFIED TO ASSIST THE ACCELERATION OF RECOVERY, HEALTH AND STABILITY OF THE AREA.

Moreton Bay Regional Council

AUTHORISATION

Delivery Manager — Date

RPEQ — Date

Project Owner / Manager — Date

Program Responsible Officer — Date

PROJECT INFORMATION

Project Number: 101166

JS — Coordinator	JC — Team Leader
KM — Designer	VM — Checked
Surveyor	Survey Date / Ref. No.

Survey Datum

MGA (GDA 94) Zone 56 SF 0.9996 — Horizontal	AHD — Vertical

Scales

ISSUE

Revisions

Original Issue — Date: 11/2022

PROJECT DESCRIPTION

GRIFFIN SPORTS COMPLEX, ELIZABETH ROAD, GRIFFIN

SPORTING COMPLEX DEVELOPMENT STAGE 2

RESTORATION PLANTING PLAN

DRAWING NUMBER

002

Drawing Number — Rev.

Drawing 2 of 2 — Original Plan Size A1