

Port of Bundaberg

Description of Environmental Values



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List of Abbreviations and Acronyms

Abbreviation / Acronym	Description
ACA	Aquatic Conservation Assessments
ALA	Atlas of Living Australia
AMA	Australasian Marine Associates
BMRG	Burnett Mary Regional Group
BRC	Bundaberg Regional Council
CBOB	Conservation and Biodiversity Operations Branch of the Queensland Department of Environment and Science
CHAMP	Coastal Habitat Archive and Monitoring Program
DAF	Queensland Department of Agriculture and Fisheries
DAWE	Commonwealth Department of Agriculture, Water and the Environment
DEHP	Former Queensland Department of Environment and Heritage Protection
DERM	Former Queensland Department of Environment and Resource Management
DES	Queensland Department of Environment and Science
DIN	Dissolved Inorganic Nitrogen
DNRME	Queensland Department of Natural Resources, Mines and Energy
DoEE	Former Commonwealth Department of the Environment and Energy
DSDMIP	Queensland Department of State Development, Manufacturing, Infrastructure and Planning
DSEWPaC	Former Commonwealth Department of Sustainability, Environment, Water, Population and Communities
DTMR	Queensland Department of Transport and Main Roads
DTMR	Queensland Department of Transport and Main Roads
EP Act	Queensland <i>Environmental Protection Act 1994</i>
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPP (Water and Wetland Biodiversity)	Queensland <i>Environmental Protection (Water and Wetland Biodiversity) Policy 2019</i>
EV	Environmental Value
FHA	Fish Habitat Area
FRC	FRC Environmental
FRP	Filterable Reactive Phosphorus
FS	Fine Sediment
GBR	Great Barrier Reef
GBRMP	Great Barrier Reef Marine Park
GBRWHA	Great Barrier Reef World Heritage Area
GPC	Gladstone Ports Corporation
GSMP	Great Sandy Marine Park
HB1	Hervey Bay 1 (HEV area)

Abbreviation / Acronym	Description
HES	High Ecological Significance
HEV	High Ecological Value
LGA	Local Government Area
LMDMP	Long Term Maintenance Dredging Management Plan
LTMMP	Long Term Management and Monitoring Plan
MDS	Maintenance Dredging Strategy
MLES	Matter of Local Environmental Significance
MNES	Matter of National Environmental Significance
MRA	Material Reclamation Area
MSES	Matter of State Environmental Significance
NCA	Queensland <i>Nature Conservation Act 1992</i>
NMS	Nearshore Marine Science
NTU	Nephelometric Turbidity Units
OEH	New South Wales Office of Environment and Heritage
Planning Scheme	Bundaberg Regional Council Planning Scheme 2015
PMAV	Property Map of Assessable Vegetation
PMST	Protected Matters Search Tool
PN	Particulate Nitrogen
PoB	Port of Bundaberg
PP	Particulate Phosphorus
QPWS	Queensland Parks and Wildlife Service
RE	Regional Ecosystem
SDA	State Development Area
SPP	<i>State Planning Policy (July 2017)</i>
SSM	Sustainable Sediment Management
STSA	Sea Turtle Sensitive Area
TEC	Threatened Ecological Community
TLPI	Temporary Local Planning Instrument
TropWATER	Centre for Tropical Water and Aquatic Ecosystem Research, James Cook University
VMA	Queensland <i>Vegetation Management Act 1999</i>
WQIP	Water Quality Improvement Plan
WQO	Water Quality Objective

Executive Summary

This report has been prepared for Gladstone Ports Corporation (GPC), who own and operate the Port of Bundaberg (PoB). The PoB is located at Burnett Heads, at the mouth of the Burnett River with some land to the south of the port and on the opposite side of the river also owned by GPC. The Port limits extend 7.25 nautical miles east from the PoB and 5.5 nautical miles north from the PoB, and include the dredged access channel and offshore dredged material placement area. The Port limits are excluded from, but surrounded on three sides, by the Great Sandy Marine Park (GSMP).

GPC undertakes maintenance dredging of the PoB channels, typically on an annual basis. GPC intend to transition its current 10-year Long Term Management and Monitoring Plan (LTMMP) to a Long Term Maintenance Dredging Management Plan (LMDMP) in alignment with the Maintenance Dredging Strategy (MDS) framework. The MDS creates a framework for best-practice maintenance dredging management, including investigating sediment management options. These options form part of the Sustainable Sediment Management (SSM) Project for the PoB, which seeks to ensure adaptive long-term environmental management, supporting sustainable development and minimising environmental harm to the PoB and surrounding areas. The SSM Project will form the basis of future permit applications for maintenance dredging and sea disposal at the PoB.

This report describes the terrestrial and marine environmental values in the vicinity of the dredged areas, dredge material placement area, onshore material reclamation area (MRA) and land owned by GPC, and will inform the SSM Project and development of the LMDMP, based on a desktop assessment (e.g. review of relevant mapping, database searches, local knowledge and ecological data, and review of relevant reports) and a brief site inspection completed in May 2020. The study area for the assessment included the waters at the mouth of the Burnett River and associated PoB wharf facilities at Burnett Heads, surrounding land owned by GPC and coastal waters within the Port limits. The environmental values identified were described and then categorised as 'key local attributes', consistent with the LMDMPs for GPC's other operations at the Port of Gladstone and Port of Rockhampton. The identified key local attributes are summarised in the table overleaf.

The site inspection in May 2020 found that the regional ecosystem (RE) mapping is incorrect in a number of locations. Where development is proposed on GPC-owned land, a detailed vegetation survey is recommended to verify the vegetation communities (REs) on the site and to apply for a property map of assessable vegetation (PMAV). Detailed surveys would also be required to confirm the extent of the subtropical and temperate coastal saltmarsh threatened ecological community (TEC).

It is recommended that a benthic habitat survey of the entire Port limits, including areas around the mouth of the Burnett River, be incorporated into the next assessment of the offshore dredged material disposal area, which is planned for the second half of 2020. This will provide more information on the benthic habitat of the Port limits, including seagrass distribution. Ideally, the survey should be completed in spring (October or November), when seagrass beds are likely to be at their greatest extent.

Ongoing monitoring of the shorebirds in the GPC-owned land will continue to provide valuable information on the habitat use of these species, including for the MRA. Where possible, confirm scientific names for observed species (suggested scientific names correlating to the common names in the database have been provided in Appendix A) and use these for future monitoring events.

It is also recommended that consultation with the Queensland Department of Agriculture and Fisheries (DAF) is undertaken to remove the onshore spoil ground from the *Waterways for Waterway Barrier Works* spatial mapping layer.

Key Local Attribute	Relevance to Port of Bundaberg
Tidal wetlands	<p>The Burnett River estuary supports ~ 540 ha of tidal wetlands comprised of mangroves, saltpan / saltmarsh and fringing coastal she oak and paperbark communities (Duke et al. 2019b), including in the tidal areas of GPC-owned land. Tidal wetland floristic diversity in the Burnett River estuary is the lowest in the Burnett-Mary region, due to extensive modification and degradation of river water quality (Mackenzie & Duke 2011). However, tidal wetlands on GPC-owned land support a relatively high diversity of mangroves and saltmarsh species (Mackenzie & Duke 2011; FRC 2008; May 2020 site inspection). Many of the tidal wetlands in the study area are mapped as essential habitat (DES 2020h), due to the presence of threatened and migratory shorebirds.</p>
Seagrass and macroalgae	<p>Seagrass appears to be absent in the estuary, while ephemeral and sparse meadows of <i>Halophila ovalis</i> and <i>H. spinulosa</i> with some macroalgae have been previously recorded within the offshore dredged material placement area (Worley Parsons 2009b; AMA 2015). It is considered likely that seagrass (a sparse coverage of <i>Halophila</i> spp.) occurs within the wider Port limits when conditions are suitable. These species provide foraging habitat for listed threatened, migratory and marine species including the green turtle, dugong and seahorses; and also provide important habitat for species of fisheries significance.</p>
Benthic fauna	<p>Ongoing benthic monitoring demonstrates highly variable composition of benthic infauna composition within the offshore dredged material placement area, consistent with a high variability in sediment type (AMA 2015). Benthic infauna are important for a range of services including nutrient cycling, bioturbation and as a component of food webs, particularly as a food source for species of fisheries and conservation significance, including loggerhead turtles (DES 2018b). Coarser sediment types supported taxa such as crabs, whereas fine sediment was dominated by polychaete worms (AMA 2015).</p>
Reef communities	<p>Inshore coral reef habitat occurs along the Woongarra Coast, from Burnett Heads (just within the Port limits) to the Elliot River (DES 2018d). Reef communities in the area are a mix of tropical, subtropical and temperate species of hard and soft corals, with at least 46 species of hard coral known to occur in the GSMP (DES 2018a). Flooding from the Burnett and Mary rivers in 2011 and 2013 negatively impacted the surrounding coral reefs, reducing coral abundance by up to 60% on the Woongarra Coast, with an increase in the coverage of the stress tolerant coral <i>Turbinaria</i> and a decrease in <i>Acropora</i> coral communities (Butler et al. 2013; Coppo et al. 2014).</p>
Fish and fisheries	<p>The Port and surrounding areas provide a range of fish habitat (e.g. mangroves, mudflats, anthropogenic structures, bare soft sediment and potentially sparse seagrass). Commercial and recreational fishing occurs in the area, targeting small and large bodied fish (i.e. whiting, yellow-fin bream, flathead), prawns and mud crabs, which are valuable to the fisheries in the local area (DAF 2020; Lupton & Heidenreich 1999).</p>
Marine mammals	<p>There are relatively few published records of marine mammals in the area. Coastal dolphin species, including the Australian snubfin dolphin and the Australian humpback dolphin have been sighted or are considered likely to occur within the Burnett River estuary and coastal environments (DES 2020b). Migratory whales, including the humpback whale, are likely to traverse further offshore through the broader Port limits during their seasonal migration (winter and spring). Dugong are likely to occur during seasonal peaks of seagrass growth, but are more likely to be seen south of the PoB in Hervey Bay (Sobtzick et al. 2017).</p>

Key Local Attribute	Relevance to Port of Bundaberg
Marine turtles	Several marine turtle species have been recorded in the area. The Mon Repos Conservation Park is located approximately 4 km south of Burnett Heads. It is the most significant loggerhead turtle rookery in the southern hemisphere, with small numbers of flatback and green turtles also nesting here (DES 2018b; Limpus 2008). During the nesting season (November to January), marine turtles will occur in the coastal waters off Burnett Heads within the Port limits, and are known to use the dredged channel as inter-nesting habitat (DES 2020m). It is possible that green turtles may occur in the study area year-round, foraging on seagrass, macroalgae, mangrove propagules and other food sources (Sobtzick et al. 2017).
Shorebirds	Barubbra Island Conservation Park, the tidal wetlands on Port-owned land associated with Wallace Creek (PoB wetland area) and the PoB MRA are important foraging and roosting habitat areas for resident and migratory shorebirds (Worley Parsons 2012). Several threatened migratory birds are known to frequent the area.
Terrestrial flora and fauna	<p>Several conservation significant flora and fauna species are known or highly likely to occur within the PoB and surrounds. The key species of conservation significance that potentially occur in the Port and surrounds (apart from shorebirds, which are described above) are the grey-headed flying fox, listed as vulnerable under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) (DEHP 2016b); and the water mouse, listed as vulnerable under the EPBC Act and Queensland <i>Nature Conservation Act 1992</i> (NCA) (DAWE 2020).</p> <p>Two TECs listed under the EPBC Act occur within the study area (DAWE 2020). The subtropical/temperate coastal saltmarsh TEC, listed as vulnerable, occurs within the study area, including at the PoB wetlands, along the Burnett River frontage of the PoB south property and on the PoB west property. A small patch of coastal swamp oak forest TEC (endangered) is likely to occur inland of the river near Barubbra Island within the study area (but not on GPC-owned land).</p>
Marine water quality	The water quality of the Burnett River estuary has been affected by altered hydrological flow, bank erosion and industrialisation (BMRG 2015). Coastal waters are likely to have good water quality at times, sufficient to support coral and seagrass growth (DES 2018d; AMA 2015, DERM 2010). There are high ecological value (HEV) waters along the Woongarra Coast, immediately south of Burnett Heads (DERM 2010). Water Quality Objectives (WQOs) under the Reef 2050 Water Quality Improvement Plan (WQIP) apply to the waters within the Port limits (State of Queensland 2018).
Cultural and heritage values	<p>There are several local heritage places within the study area, listed under the Bundaberg Regional Council planning scheme (BRC 2020a).</p> <p>The surrounding wetlands are of cultural significance to Indigenous Australians and are monitored by the Gidjarjil Development Corporation rangers. Two Aboriginal cultural sites are located on GPC-owned land (GPC 2017).</p>
Social values	The Port is the gateway to the southern Great Barrier Reef, with many tourism operators operating from the marina, international visitors entering Australia through the Ports customs facilities and the social and leisure environment attracting locals and tourists to the marina. The Port's coastal environment is frequently used by recreational fishers, and turtle nesting and hatching season at Mon Repos attracts tourists to the region (DES 2018d).

1 Introduction

This report has been prepared for Gladstone Ports Corporation (GPC), who operate the Port of Bundaberg (PoB), located at Burnett Heads in Queensland (Figure 1.1). GPC undertakes maintenance dredging of the PoB channels, swing basins and berths, typically on an annual basis. The majority of dredged material is placed at sea in an offshore dredged material placement area within the Port limits (Figure 1.2). There is also an onshore Material Reclamation Area (MRA) on GPC-owned land at Burnett Heads that is primarily used for the management of dredged material from the PoB marina and boat harbour areas, but that is available for use during maintenance dredging of the channels and swing basin should at-sea disposal not be suitable due to contaminated sediments or operational reasons (Worley Parsons 2012). The dredging and disposal activities occur outside of the Great Barrier Reef World Heritage Area (GBRWHA) and Great Barrier Reef Marine Park (GBRMP). The Port limits are excluded from, but surrounded on three sides, by the Great Sandy Marine Park (GSMP).

GPC intend to transition its current 10-year Long Term Management and Monitoring Plan for Maintenance Dredging and Disposal (LTMMP; Worley Parsons 2012) to a Long Term Maintenance Dredging Management Plan (LMDMP) in alignment with the Maintenance Dredging Strategy (MDS) framework (TMR 2016). The MDS creates a framework for best-practice maintenance dredging management, including investigating sediment management options. These options form part of the Sustainable Sediment Management (SSM) Project for the PoB, which seeks to ensure adaptive long-term environmental management, supporting sustainable development and minimising environmental harm to the PoB and surrounding areas. The SSM Project will form the basis of future permit applications for maintenance dredging and sea disposal at the PoB.

1.1 Report Objectives

This report describes the environmental values of the PoB in the vicinity of the dredged areas and dredge material placement area, to inform the SSM Project and LMDMP. Specifically, it identifies environmental constraints that need to be considered when assessing potential impacts from various maintenance dredging options, and assessing areas that could be improved by maintenance dredging. This report focusses on the terrestrial and marine environmental values of the PoB, although it includes a brief description of cultural and social values, where relevant.

1.2 Description of Study Area

The study area for the assessment includes the waters at the mouth of the Burnett River and associated PoB wharf facilities at Burnett Heads, and surrounding land owned by GPC (Figure 1.1). It also includes the coastal waters that are within the Port limits, which extend 7.25 nautical miles east from the PoB and 5.5 nautical miles north from the PoB, and include the dredged access channel and dredged material placement area (GPC 2010, Figure 1.2).

While the Port limits also extend upstream in the Burnett River for a distance of 25.9 km from the mouth (to the Branyan Barrage) (GPC 2010), these reaches of the river were excluded from the assessment as they are not dredged. The upstream extent of the study area was located in the vicinity of the Bundaberg Sailing Club which is immediately adjacent to the PoB south property, approximately 6.5 km upstream of the river mouth (Figure 1.1).

The PoB lies within the Bundaberg Regional Council (BRC) local government area (LGA) and is within the Southeast Queensland bioregion. It is also within the Bundaberg State Development Area (SDA) (Figure 1.1).

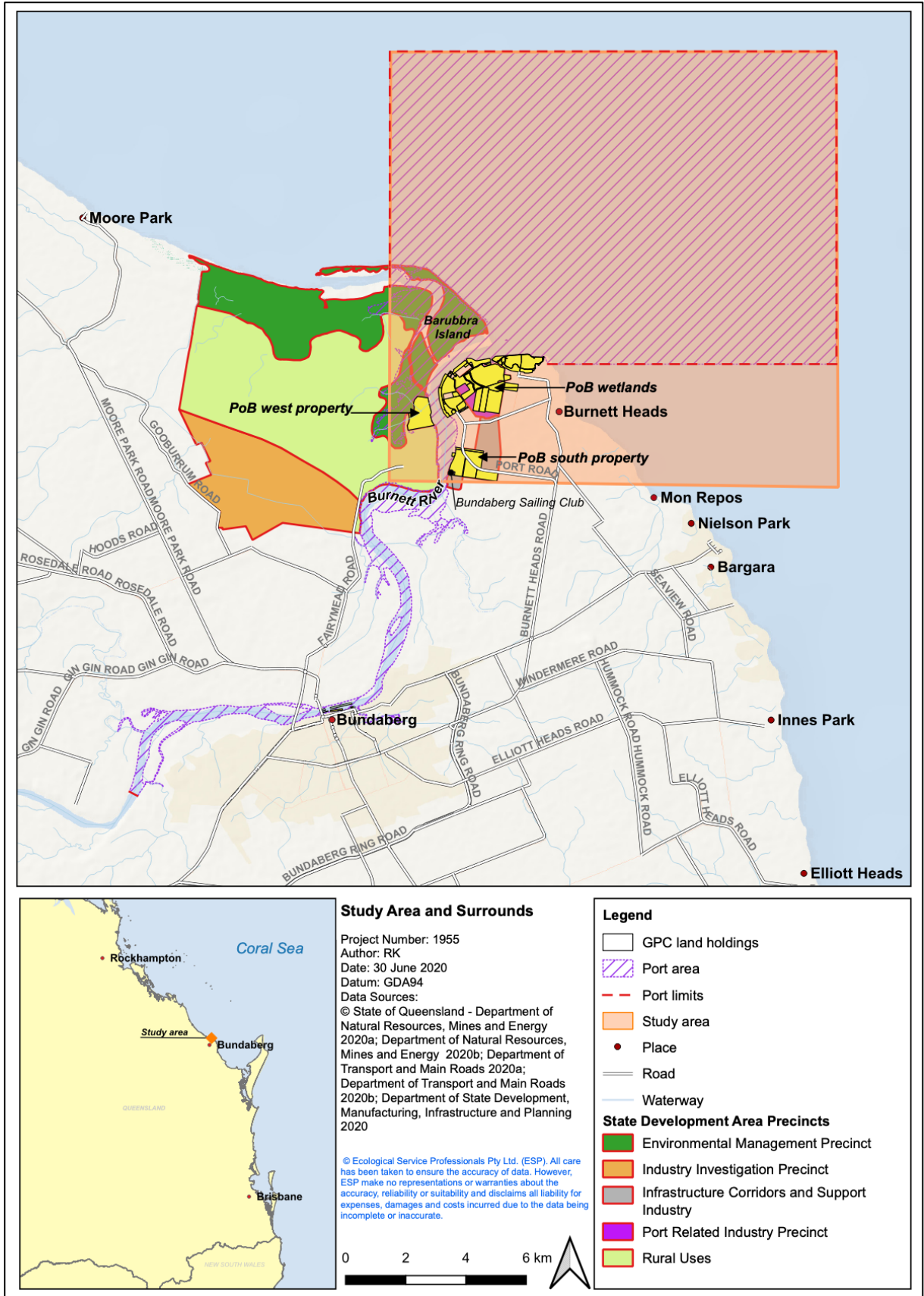


Figure 1.1 Study area for this assessment, showing the location of the Port limits, land owned by the PoB and the SDA precincts

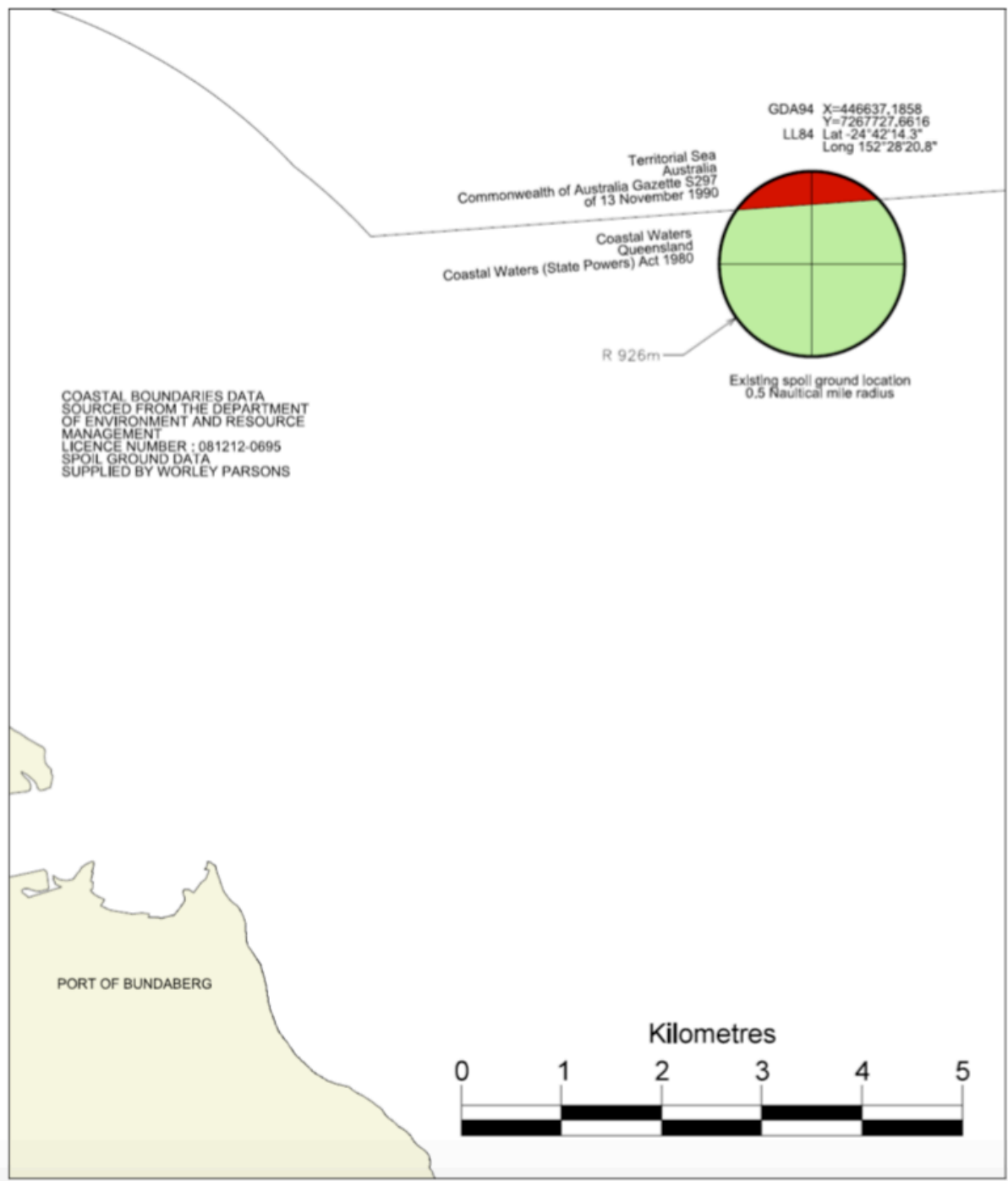


Figure 1.2 Location of offshore dredged material placement area (spoil ground) (from Worley Parsons 2012)

2 Approach and Methodology

2.1 Environmental Values

Environmental values (EVs) have been defined in accordance with the Queensland *Environmental Protection Act 1994* (EP Act) definition, i.e.:

- a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety; or
- another quality of the environment identified and declared to be an environmental value under an environmental protection policy or regulation.

The description of environmental values focusses on the ecological values of the study area, specifically:

- Matters of National Environmental Significance (MNES) protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- Matters of State Environmental Significance (MSES) as defined under the State Planning Policy (SPP)
- Matters of Local Environmental Significance (MLES) identified under the Bundaberg Regional Council Planning Scheme 2015 (the Planning Scheme)
- any relevant prescribed environmental values under the Queensland *Environmental Protection Policy (Water and Wetland Biodiversity) 2019* [EPP (Water and Wetland Biodiversity)], and
- any other general ecological values not included in the above.

Brief descriptions of social, heritage (including Indigenous cultural heritage), recreational and scenic values have also been provided, where relevant.

The environmental values identified were described and then categorised as 'key local attributes', consistent with the LMDMPs for GPC's other operations at the Port of Gladstone and Port of Rockhampton. The categories used were generally consistent with these documents, and included:

- tidal wetlands (mangroves and saltmarsh)
- seagrass and macroalgae
- benthic fauna
- reef communities
- fish and fisheries
- marine mammals
- marine turtles
- shorebirds
- terrestrial flora and fauna
- marine water quality
- cultural and heritage values, and
- social values.

2.2 Information Sources

The description of environmental values is based on information from the following sources:

- database searches including the:
 - Commonwealth Department of Agriculture, Water and Environment (DAWE) EPBC Act Protected Matters Search Tool (PMST) report for the study area plus a 5 km buffer (DAWE 2020; report is provided in Appendix C)
 - Queensland Department of Environment and Science (DES) Wildlife Online database search for the study area (DES 2020a; report is provided in Appendix C), as well as available location records for listed threatened species (DES 2020b)
 - Queensland DES Environmental Reports Online database search (DES 2020c; reports are provided Appendix C)
 - Atlas of Living Australia (ALA) location records for listed threatened species in the study area (ALA 2020)
 - Birddata online database (Birdlife Australia 2020)
- the latest Queensland Government Spatial Datasets, including:
 - Vegetation management and Regional Ecosystem (RE) map – Version 11.0 (Department of Natural Resources, Mines and Energy (DNRME 2020c)
 - Aquatic Conservation Assessments (ACA) (DES) (DERM 2010)
 - Queensland wetlands program mapping (DES 2020k)
 - Intertidal and subtidal habitat mapping for Central Queensland (DES 2020k)
 - Waterways for Waterway Barrier Works and Fish Habitat Areas (Department of Agriculture and Fisheries (DAF) (DES 2020f)
- the BRC planning scheme interactive mapping (BRC 2020b)
- the most recent available report from the Queensland Turtle Conservation Project regarding marine turtle breeding on the Woongarra Coast (Limpus et al. 2019)
- the LTMMMP for the Port of Bundaberg 2012–2022 (Worley Parsons 2012)
- previous ecological assessments completed in the study area, including:
 - shorebird monitoring within the MRA and surrounds (data collected by the Burnett Mary Regional Group (BMRG) and Birdlife Bundaberg, collated and provided by GPC); the collated data set is provided in Appendix A
 - ecological constraints study and essential habitat assessment (GHD 2008 and 2009)
 - baseline mangrove and saltmarsh survey (FRC 2008)
 - sediment sampling and analysis results (pre-maintenance dredging) (Worley Parsons 2009a, NMS 2014)
 - spoil ground seagrass and infauna monitoring (Worley Parsons 2007, 2009b 2011; AMA 2015), and
 - Southern GBR Coastal Habitat Archive and Monitoring Program (CHAMP) (Duke et al. 2019a, b).

The description of cultural and heritage values (including Indigenous cultural heritage) and social values is based on discussions with GPC, records held by GPC and available desktop information only. For this exercise, no community consultation has been undertaken.

2.3 Presence of Threatened Flora and Fauna Species

No field surveys targeting threatened flora and fauna species have been completed as part of the current assessment. The PMST (report provided in Appendix C) is a predictive tool, and is not indicative of recorded species occurrences. As such, an assessment of the likelihood of occurrence of each species listed in the report was completed, in accordance with the criteria outlined in Table 2.1. Records were sourced from the Wildlife Online search (Appendix C), the ALA (ALA 2020) and the shorebird data collected by BMRG and Birdlife Bundaberg and provided by GPC (Appendix A).

The results of the likelihood of occurrence assessment are provided in Appendix B.

Table 2.1 Likelihood of occurrence assessment criteria

Likelihood of Occurrence	Assessment Criteria
Unlikely	No previous records of the species within the Bundaberg region and one or more of the following criteria is met: <ul style="list-style-type: none"> beyond the current known geographic range; are only found in areas with specific habitat types or resources that do not occur in the PoB limits; and/or are considered extinct in the wild.
Possible	Species previously recorded within the Bundaberg region, but not within or in close proximity to the study area, and one or more of the following criteria is met: <ul style="list-style-type: none"> within the known distribution of the species; and/or potential habitat resources are present in the PoB limits.
Likely	Species previously recorded within the Bundaberg region and one or more of the following criteria is met: <ul style="list-style-type: none"> dependent on habitats or habitat resources that are available in the study area; and/or suitable habitats are available in the study area that can support a resident population or individuals of the species.
Known	Species previously recorded within the study area.

2.4 Site Inspection

A site inspection was completed by Principal Ecologists Lauren Thorburn and Dr Justin Watson (Gondwana Ecology Group) from 6 – 9 May 2020. The weather was fine for the duration of the survey. The aim of the site inspection was to verify the accuracy of the available desktop information. The site inspection focussed on the GPC landholdings with mapped environmental values, i.e. the MRA (Lots 5&6 RP7193 and Lot 6 SP166192), PoB wetlands (Lot 501 SP279707, Lot 6 SP166192, Lot 10 RP7196), PoB south property (Lot 5 SP274161 and Lot 272 CP869477) and PoB west property (Lot 23 SP171448) (Figure 1.1). General observations were made of surrounding areas.

Within each of the focus areas, observations were made at a series of GPS points (± 4 m accuracy) to verify the mapped environmental values of the site. Descriptions and photographs of vegetation communities and any incidental fauna sightings were taken at each of these points.

Where the ground-truthed vegetation communities did not match the mapped vegetation (RE) communities, the indicative extent of ground-truthed vegetation communities was mapped based on the GPS points and associated field descriptions, and interpretation of recent high-quality aerial photography (viewed on Queensland Globe, Queensland Government 2020). The boundaries of each vegetation community have not been extensively ground-truthed, and additional surveys would be required to confirm these in the future, if needed (e.g. to support future approvals).

3 Description of Environmental Values

3.1 Burnett River Estuary

The Burnett River estuary has the largest catchment area of all the estuaries within the Burnett-Mary region, discharging into the Coral Sea at Burnett Heads. The upper catchment is primarily used for cattle grazing, with the City of Bundaberg and surrounding rural residential land use comprising the majority of the lower catchment (Mackenzie & Duke 2011). There are 28 dams and weirs along the river, with water extracted for agricultural and urban uses. This has significantly altered the hydrology of the river, negatively affecting aquatic flora and fauna (Mackenzie & Duke 2011 and references cited therein).

The Burnett River estuary has been extensively modified by urban, agricultural and industrial development, which has altered hydrological flow and sedimentation. Large scale modification of the river has occurred due to the development of the PoB located at the mouth of the river, and construction of the Ben Anderson Barrage upstream. Modification of the river mouth includes a training wall, separating Barrubra Island from the main channel; and ongoing dredging activities (Moss et al. 2009; Duke et al. 2019b).

The Burnett River estuary is river-dominated, with a tide-dominated delta. The upper estuary is predominately mud substrate due to a strong riverine influence and the lower estuary is dominated by sand due to oceanic influence (Mackenzie & Duke 2011). Although the estuary is highly modified, ~ 540 ha of tidal wetlands remain (Duke et al. 2019b). Despite the extensive modifications that have occurred in the estuary, some areas are considered to be of notable environmental value. This includes Barrubra Island at the mouth of the river, which maintains healthy tidal wetlands despite significant hydrological alterations as a result of the training wall (Duke et al. 2019b).

3.2 Terrestrial Vegetation

3.2.1 Terrestrial Vegetation within the Study Area

The vegetation within the study area is typical of tidal and coastal environments. Under the Queensland RE mapping system, the dominant remnant REs in the area are 12.1.2 (estuarine salt flats and saltmarshes) and 12.1.3 (estuarine mangroves and related tree types) (Figure 3.1). These communities are discussed in Section 3.2 below. Landward remnant REs are typically 12.2.11 (*Corymbia tessellaris* +/- *Eucalyptus tereticornis*, *C. intermedia* and *Livistona decora* woodland on beach ridges, that contains palustrine wetlands in swales). The surrounding land is non-remnant agricultural (sugar cane) or industrial land (Figure 3.1).

The majority of the mapped remnant vegetation in the study area is classified as least concern; however, two of concern RE types are present in the study area (Figure 3.1):

- A small patch of RE 12.3.17 (simple notophyll fringing forest usually dominated by *Waterhousea floribunda*), approximately 0.5 ha in size, is mapped on the western side of the river in Fairymead on GPC-owned land (PoB west property, refer Figure 1.1), approximately 1 km from the PoB and 500 m from the river bank. This RE is listed as of concern under the Queensland *Vegetation Management Act 1999* (VMA).
- RE 12.1.1 (*Casuarina glauca* woodlands), is mapped west of Barubbra Island and is listed as of concern under the VMA. It is surrounded by REs 12.2.7 (*Melaleuca quinquenervia* forest) and 12.1.3 (mangroves). This patch is not within GPC-owned land.

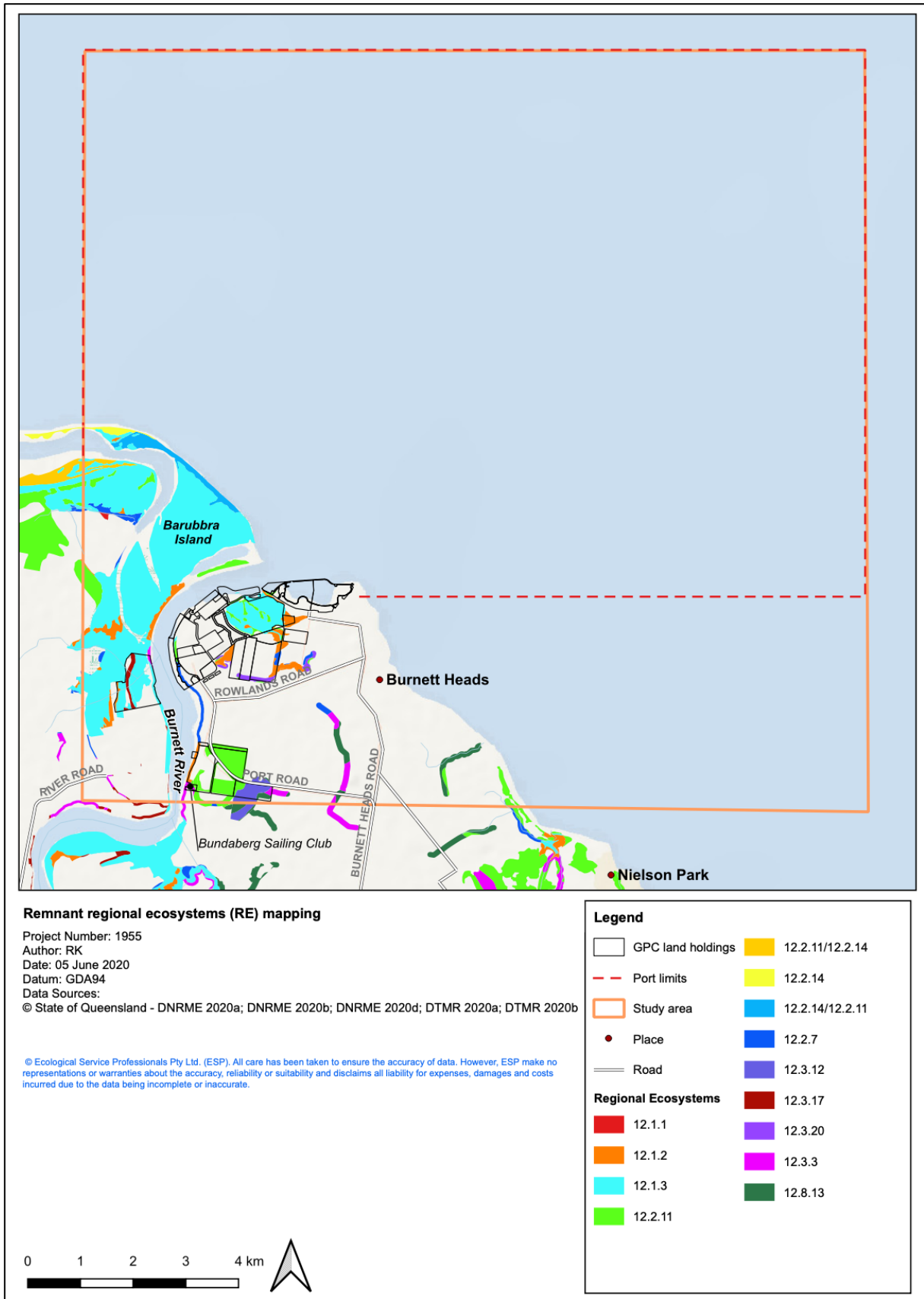


Figure 3.1 Queensland Government mapping of REs in the vicinity of the study area

3.2.1.1 PoB Wetlands

The PoB wetlands are dominated by tidal wetlands i.e. REs 12.1.2 (saltmarsh) and 12.1.3 (mangroves) (Figure 3.1), as discussed in Section 3.3.2 below. However, several elevated sand ridges extend through the wetland, supporting RE 12.2.11. This was confirmed during the site inspection, which confirmed that these areas had a canopy dominated by *C. tessellaris* and *E. tereticornis*, with wattles (*Acacia* sp.), some vine thicket elements and weeds (Figure 3.2). Detailed surveys of these sand ridges in 2008 also found swamp oak (*C. glauca*), creeping boobialla (*Myoporum parvifolium*), tuckeroo (*Cupaniopsis anacardioides*) and weeds including broad-leafed pepper tree (*Schinus terebinthifolius*) (FRC 2008).

a)



b)



Figure 3.2 Photos from the May 2020 site visit showing a) an example of RE 12.2.11 on the sand ridge; b) interface between terrestrial vegetation (left) and mangroves (right)

3.2.1.2 MRA

The MRA is used for placement of dredged material, and there is a surrounding constructed tidal channel that receives discharges from the MRA. At the time of the May 2020 site inspection, the MRA was drained of water and consisted of bare sediment with some areas of saltmarsh, presumably due to the high salinity of the sediment (though these are not connected to the surrounding tidal channel, and therefore do not provide fish habitat).

Part of the constructed channel to the south of the MRA has been mapped as high value regrowth of RE 12.3.20 (*M. quinquenervia*, *C. glauca* +/- *E. tereticornis*, *E. siderophloia* open forest on low coastal alluvial plains) (Figure 3.1). However, based on the May 2020 site inspection, this area consists of mangroves re-colonising the channel. There was a narrow band of *C. glauca* noted just beyond the southern boundary of the GPC-owned land, which is mapped as RE 12.2.11 (*C. tessellaris* +/- *E. tereticornis*, *C. intermedia* and *L. decora* woodland on beach ridges), though it is likely this community is better described as RE 12.3.20 or 12.1.1 (*C. glauca* woodland on margins of marine clay plains).

There is also a patch of least concern regrowth of RE12.2.7 (*M. quinquenervia* or rarely *Melaleuca dealbata* open forest on sand plains) mapped in the constructed channel to the east of the MRA. However, based on the May 2020 site inspection, this area consists of mangroves re-colonising the channel.

There are some patches of high value regrowth of RE 12.3.20 mapped to the west of the MRA (outside of GPC-owned land). While the mapping over-represents these areas (which are mostly saltmarsh), there is one small patch dominated by *C. glauca* that may represent this RE.

The mangrove and saltmarsh communities surrounding the MRA are described in further detail in Section 3.3.

3.2.1.3 PoB South Property

The PoB south property (Figure 1.1) was assessed, including a field survey, in 2007 (GHD 2008). The survey found that this property supports a large remnant patch of bushland that is in good to very good condition, meaning that it is an important feature in a local ecological context given the clearing and associated rural and residential land uses that have occurred on adjacent properties (GHD 2008). However, some parts of the PoB south property have been disturbed due to planting of an exotic pine plantation, and the southern parts of the property have been used for cattle grazing (GHD 2008). The results from the May 2020 site inspection were consistent with these findings, and are described in further detail below.

The majority of PoB south property is mapped as RE 12.2.11 (Figure 3.1) (*C. tessellaris* +/- *E. tereticornis*, *C. intermedia* and *L. decora* woodland on beach ridges). Other characteristic species of this RE include *M. dealbata*, *Callitris columellaris*, *Petalostigma pubescens*, *E. exserta*, *Planchonia careya*, *Leptospermum neglectum* and *Acacia julifera*. *Melaleuca* spp. and *E. tereticornis* dominate in swales. Vine forest species are sometimes present as sub-canopy or understorey. The site inspection in May 2020 confirmed that the mapping of this RE was correct. *C. tessellaris*, *E. tereticornis* and *C. intermedia* dominated the canopy in most places, with *Melaleuca* spp. in swales and occasional black bean (*Castanospermum australe*) trees. The understorey was generally grass with weeds (including lantana, *Lantana camara*), though there were vine-thicket elements in places (Figure 3.3a).

RE 12.3.12 (*M. viridiflora* var. *viridiflora*, *E. latisinensis* or *E. exserta* +/- *M. quinquenervia*, *C. intermedia*, *E. tereticornis* woodland) also occurs in the PoB south property (Figure 3.1). The presence of this RE was confirmed during the site inspection, with *E. tereticornis* and *M. quinquenervia* dominating the canopy, and sedges, reeds and grasses (including the exotic para grass, *Urochloa mutica*) in the wet understorey (Figure 3.3b). This area provided wetland habitat at the time of the site inspection, though had recently been dry during drought conditions (Pascoe, J. [GPC], pers. comm. May 2020).

High-value regrowth vegetation comprised of REs 12.3.3 (*E. tereticornis* woodland on quaternary alluvium) and 12.8.13 (Araucarian complex microphyll vine forest) is mapped in the western portion of the property, adjacent to Rubyanna Road (Figure 3.1). While regrowth was noted in this area during the site inspection, Araucarians (pines) were not noted; rather the regrowth was dominated by wattles (*Acacia* sp.) and weeds, with bulrush (*Typha* sp.) and para grass in wet areas (Figure 3.3c).

West of Strathdees Road, there are some areas of RE 12.2.11 mapped (Figure 3.1), which was confirmed during the May 2020 site inspection. However, there are some areas immediately adjacent to Strathdees Road, north of the former pine plantation, that appeared to be potentially remnant based on the size and nature of the canopy trees (Figure 3.4).

A narrow band of RE 12.1.2 (saltmarsh) is mapped along the Burnett River frontage (Figure 3.1). Based on the site inspection, there is a narrow band of mangroves along the river bank, with an extensive saltmarsh and saltpan behind (landward of) the mangroves. The RE mapping substantially under-represents the extent of saltmarsh and saltpan on the site (Figure 3.3d & Figure 3.4; refer to Section 3.3.6.3 below for a description of the saltmarsh).

a)



b)



c)



d)



Figure 3.3 Photos from the May 2020 site visit showing a) an example of RE 12.2.11; b) view north east towards the RE 12.3.12 wetland; c) weeds and little regrowth in the area mapped as high-value regrowth; d) view of extensive saltmarsh looking north from the Bundaberg Sailing Club

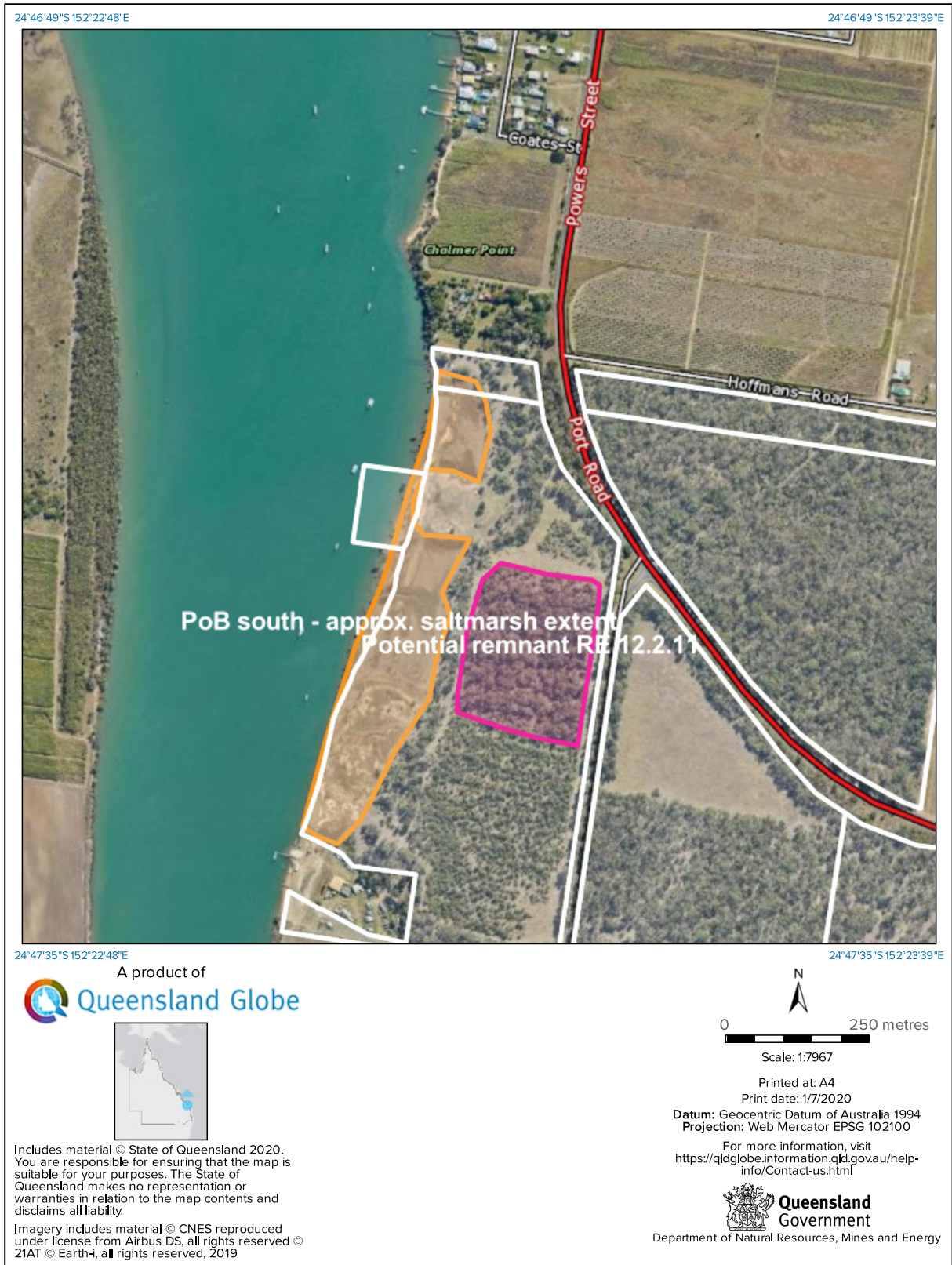


Figure 3.4 Indicative extent of potential remnant RE 12.2.11 and saltmarsh on the PoB south property

3.2.1.4 PoB West Property

The PoB west property (Figure 1.1) is dominated by tidal wetlands i.e. REs 12.1.2 (saltmarsh) and 12.1.3 (mangroves), as discussed in Section 3.3 below. There are also elevated areas adjacent to the Burnett River that are mapped as non-remnant; these areas have been previously used for the placement of dredged spoil (Pascoe, J. [GPC], pers. comm. May 2020). The May 2020 site inspection confirmed that these areas did not contain remnant or regrowth vegetation; rather they were dominated by weeds (Figure 3.5a, b).

There is an area of regrowth and a small patch of remnant of concern RE 12.3.17 (simple notophyll fringing forest usually dominated by *W. floribunda*) mapped on the PoB west property (Figure 3.1). However, this community was not found during the May 2020 site inspection. Both of the mapped areas of RE 12.3.17 were cleared and dominated by weeds (Figure 3.5c). While some regrowth and remnant large trees were noted within the mapped regrowth area, these were dominated by *C. tessellaris*, *C. intermedia*, *Acacia* sp., *Clerodendrum* sp., with abundant weeds in the understorey (Figure 3.5d).



Figure 3.5 Photos from the May 2020 site visit showing a) rock wall along the bank of the Burnett River with elevated historical dredged material placement area on the right; b) weeds growing atop the historically placed dredged material; c) view through the mangroves towards the mapped remnant patch of RE 12.3.17 which was cleared paddock; d) trees and weeds within the mapped regrowth patch of RE 12.3.17

3.3 Tidal Wetlands

Tidal wetlands, located within the coastal environment where rivers meet the sea, are influenced and regulated by natural tidal patterns. Tidal mangrove swamps/forests and saltmarshes are common habitat types within a tidal wetland and hold important ecological and biodiversity value. Tidal wetlands also provide important summer roosting habitat for threatened migratory shorebirds.

Mangrove forests are highly productive and are of vital ecological and commercial importance, providing food, shelter, nursery grounds and breeding habitat for invertebrates, birds, green turtles (*Chelonia mydas*) and fish (including many commercial fishery species, such as prawns and finfish) (Nagelkerken et al. 2008). They are also important for the stabilisation of estuarine channel beds and banks, acting as a buffer during storms and cyclones by dissipating wind and wave energy before it reaches the shoreline (Carlton 1974; Spalding et al. 2014, DoEE 2016).

Saltmarsh communities are often located high in the intertidal zone on the landward border of mangrove forests, and are rarely inundated, resulting in high concentrations of salts and low levels of oxygenation in sediments (Johns 2006). Saltmarshes are vital habitats that provide an interface between terrestrial and marine environments, contribute to the production of detritus and nutrient cycling in coastal areas, and provide food resources and shelter for juvenile fish and invertebrates (GBRMPA 2014; Johns 2006; Connolly 1999). Saltmarsh communities are often made up of a variety of floral species, including succulents, grasses, low shrubs and bare salt pans.

3.3.1 Mangroves within the Study Area

Tidal mangrove and saltmarshes are common throughout the Bundaberg region and within the study area (Figure 3.6). However, the mangrove community of the Burnett River estuary is the most species-poor in the region, attributed to altered hydrology and limited freshwater input (Duke et al. 2019b). On the western side of the Burnett River (opposite the PoB), mangrove forests extend from the mouth of the river to the upstream extent of the study area. While this is an extensive wetland and mangroves appear healthy, the overall species richness, biomass and habitat complexity of mangroves in this area is low (Mackenzie & Duke 2011). Mangrove forests in the Burnett River estuary upstream of the study area are limited to fringing grey mangroves (*Avicennia marina*).

The largest mangrove forest in the study area is in the Barubbra Island Conservation Park and is hydrologically separated from the Burnett River estuary due to a seawall (Duke et al. 2019b). Dominant mangrove species include *A. marina* and river mangrove (*Aegiceras corniculatum*), with their dominance favoured by increased sedimentation and nutrients in the estuary. There is an area of coastal tree swamp (dominated by *Melaleuca* and *Eucalypt* species) within the Barubbra Island Conservation Park, located between the seawall and mangrove forest (Section 5.3).

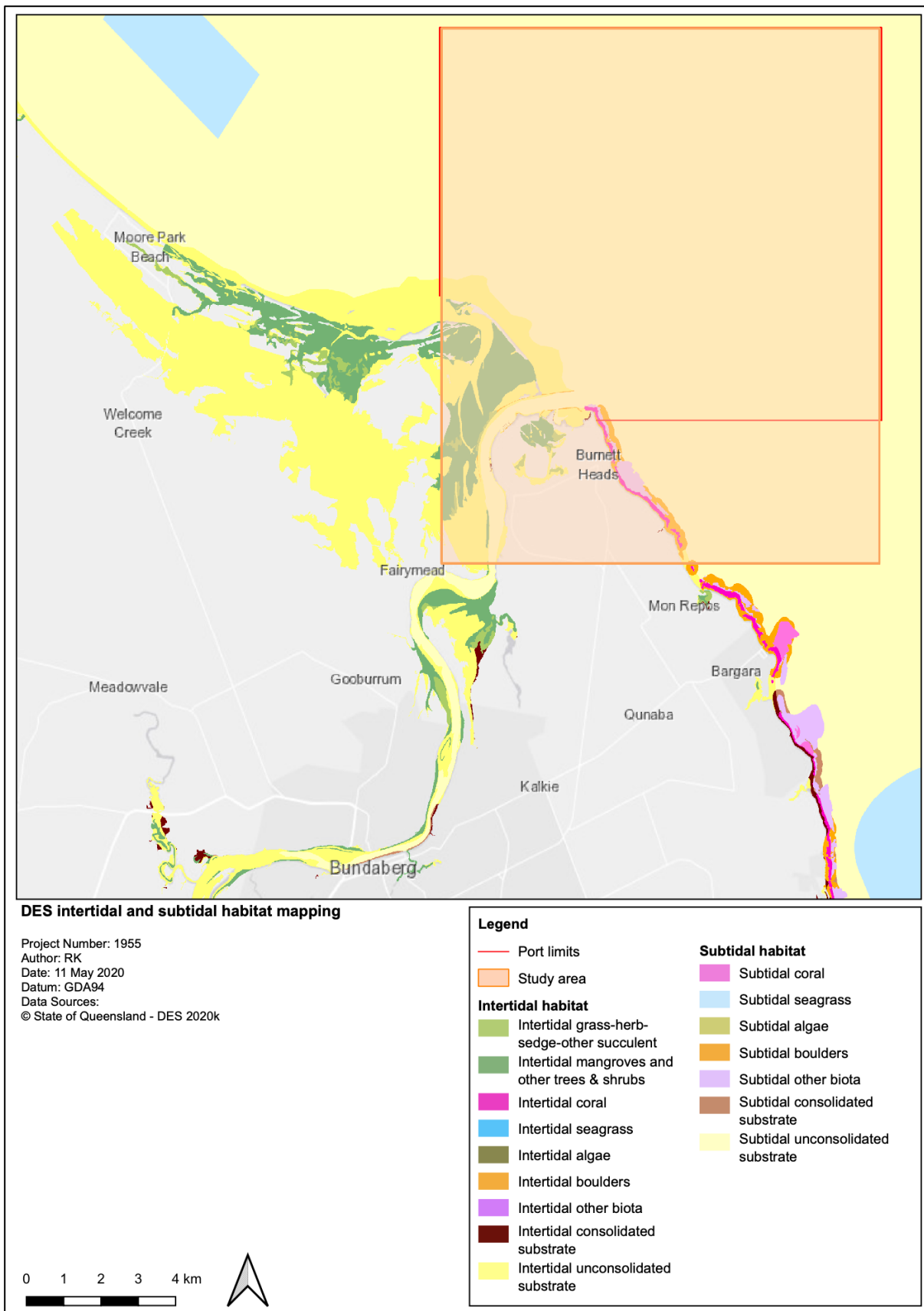


Figure 3.6 Subtidal and intertidal habitat mapping completed by DES in the vicinity of the study area

3.3.2 PoB Wetland

There are tidal wetlands on GPC-owned land at Burnett Heads, associated with Wallace Creek (referred to as the PoB wetland throughout this report). This area has been modified historically. Modifications identified by FRC (2008) include:

- construction of a bund wall around the tidal wetland associated with Wallace Creek in 2002, which now forms the southern, western and north western boundary of the PoB wetland
- construction of a rock wall along the eastern boundary of the PoB wetland to limit tidal inundation of the adjacent paddock, and
- construction of a large drain to the south of Wallace Creek, that extends south and then west around the edge of the MRA.

The mangrove forest of the PoB wetland is the last remaining stand of mangroves in the PoB area that is hydrologically connected to the mouth of the Burnett River (Figure 3.6), and it has the highest tidal wetland species diversity of any wetland in the estuary, being comprised of salt pans, saltmarsh and mangrove forests – including the only stand of club mangrove (*Aegialitis annulata*) in the estuary, and coastal *Melaleuca* / *Eucalypt* tree swamp (Mackenzie & Duke 2011).

A survey of this area in 2008 found that west of Wallace Creek, the mangrove community was dominated by yellow mangrove (*Ceriops australis*), with some areas dominated by *A. marina*, red mangrove (*Rhizophora stylosa*) and black mangrove (*Lumnizera racemosa*). Mixed mangrove communities were common east of the creek (FRC 2008; Table 3.1). The observations during the May 2020 site inspection were consistent with the mapping and description of communities by FRC in 2008 (Figure 3.7).

Mangrove communities in the 2008 survey were assessed as being in fair to good health, with small areas of poor health, and one small area of dieback, which was attributed to altered hydrology and ponded water (FRC 2008). Later assessments found that mangrove retreat was evident in the PoB mangrove area due to drought stress (Mackenzie & Duke 2011). This was due to an ecotone shift associated with long-term climatic conditions. Mangrove retreat is known to occur at the landward margins of the forest during times of drought, as a result of increasing salinity, which prevents water uptake and increases nutrient demand in mangrove trees, resulting in mangrove trees at the landward edge of the forest, at the upper end of the species salt tolerance, dying (Mackenzie & Duke 2011). Often, this results in an increase in saltmarsh species (which have a higher salt tolerance) expanding into the area of dead mangrove trees. Detailed surveys of mangrove health were not completed during the site inspection in May 2020; however, mangroves appeared to be in good health. No areas of dieback were noted.

Table 3.1 Tidal wetland plant species known in the Burnett River estuary, and recorded in the PoB wetland

Species Name	Common Name (FRC 2008; Duke et al. 2019b)	Recorded in PoB Wetland (FRC 2008)
Mangroves		
<i>Aegialitis annulata</i>	club mangrove	yes
<i>Aegiceras corniculatum</i>	river mangrove	yes
<i>Avicennia marina</i>	grey mangrove	yes
<i>Ceriops australis</i>	yellow mangrove	yes*

Species Name	Common Name (FRC 2008; Duke et al. 2019b)	Recorded in PoB Wetland (FRC 2008)
<i>Excoecaria agallocha</i>	milky mangrove / blind-your-eye mangrove	yes
<i>Lumnitzera racemosa</i>	black mangrove	yes
<i>Osbornia octodonta</i>	myrtle mangrove	
<i>Rhizophora stylosa</i>	red mangrove	yes
Saltmarsh		
<i>Enchylaena tomentosa</i>	ruby saltbush	yes
<i>Fimbristylis polytrichoides</i>	rusty sedge	
<i>Limonium australe</i>	native sea lavender	yes
<i>Salsola kali</i>	prickly saltwort	
<i>Sarcocornia quinqueflora</i>	samphire	yes
<i>Sesuvium portulacastrum</i>	sea purslane	yes
<i>Sporobolus virginicus</i>	saltcouch	yes
<i>Suaeda australis</i>	seablite	yes
<i>Suaeda arbusculoides</i>	jelly bean plant	
<i>Tecticornia indica</i>	glasswort	

* recorded as *Ceriops tagal* by FRC in 2008, but since demonstrated to be a distinct species

a)



b)



Figure 3.7 Mangroves in the PoB wetland a) *C. australis*-dominated community with *A. marina* and b) low mangrove shrub looking towards a sand ridge with terrestrial vegetation

3.3.3 MRA

Mangroves are recolonising the constructed channel around the MRA. In 2008, there were some areas of *A. annulata* shrubs and seedlings colonising parts of the channel (FRC 2008). In the 12 years since that survey, substantial mangrove communities have developed within the drain, dominated by *A. marina* with *A. annulata* (Figure 3.8).

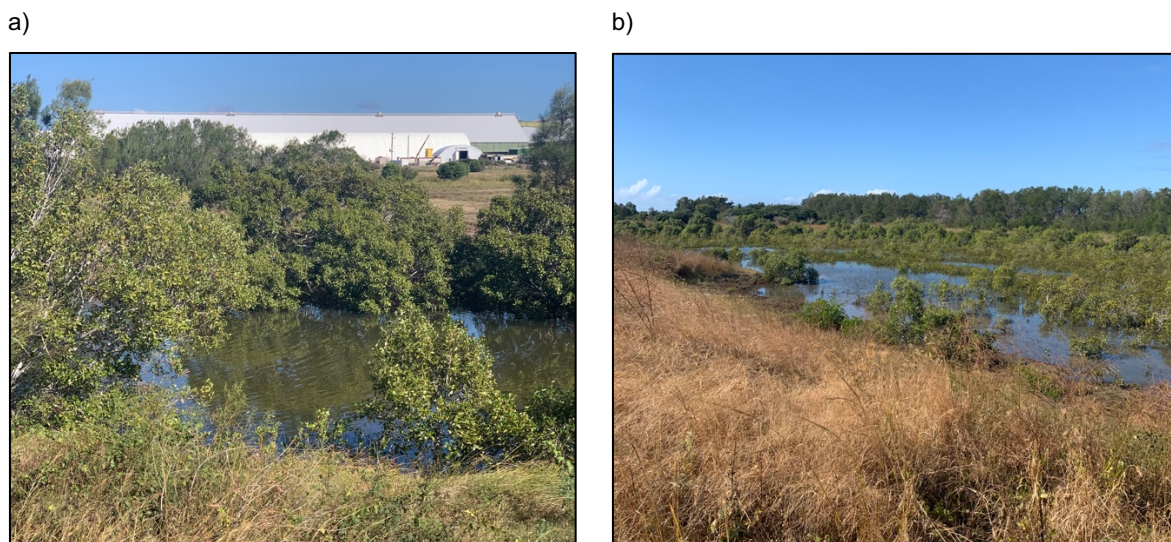


Figure 3.8 Mangroves lining the constructed channel around the MRA a) to the west of the MRA b) to the south of the MRA

3.3.4 PoB South Property

There was a narrow band of mangroves, dominated by *A. marina*, growing along the bank of the Burnett River at the PoB south property. Some mangrove shrubs were in poor condition and had been affected by erosion of the shoreline from wave action (Figure 3.9).

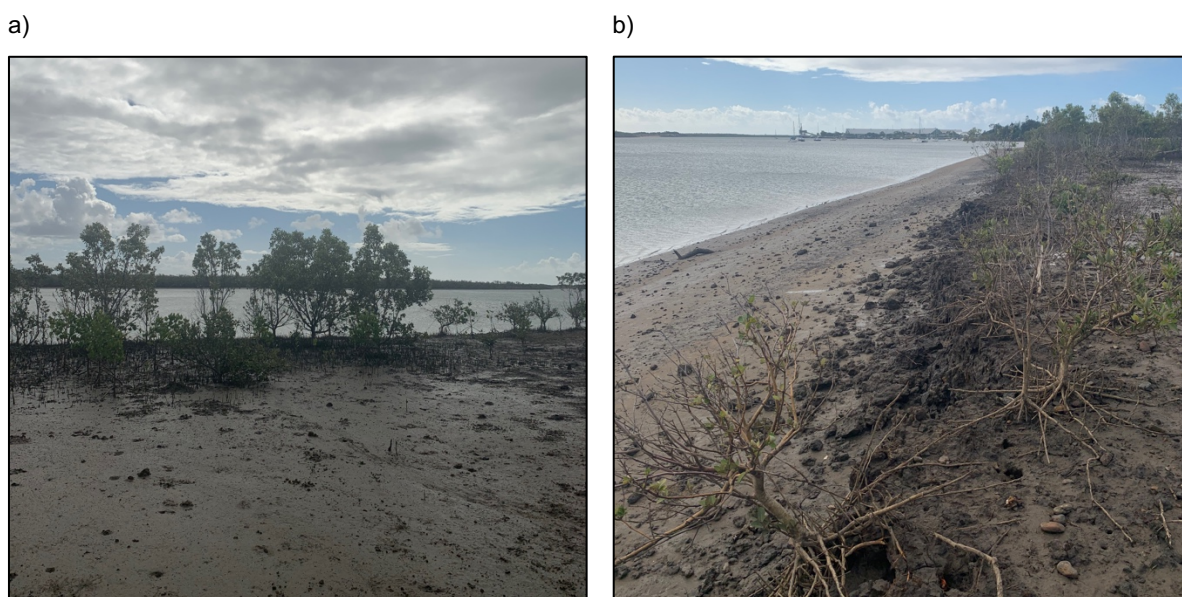


Figure 3.9 Mangroves along the Burnett River on the PoB south property a) stand of *A. marina* and b) shoreline erosion

3.3.5 PoB West Property

There are extensive areas of mangrove on the PoB west property, with the distribution being as shown in the RE mapping (Figure 3.1). Mangrove species observed during the May 2020 site inspection included *A. marina*, *R. stylosa*, *C. australis* and orange mangrove (*Bruguiera gymnorhiza*) (Figure 3.10). This relatively high diversity is unusual in the context of most mangrove areas associated within the Burnett River estuary, and the presence of *B. gymnorhiza* has not previously been reported within the mangrove forests associated with the Burnett River (Mackenzie & Duke 2011). However, it is noted that the mangroves on the PoB west area are associated with Fairymead Creek and are not directly connected with the river – this area was not mapped by Mackenzie & Duke (2011).

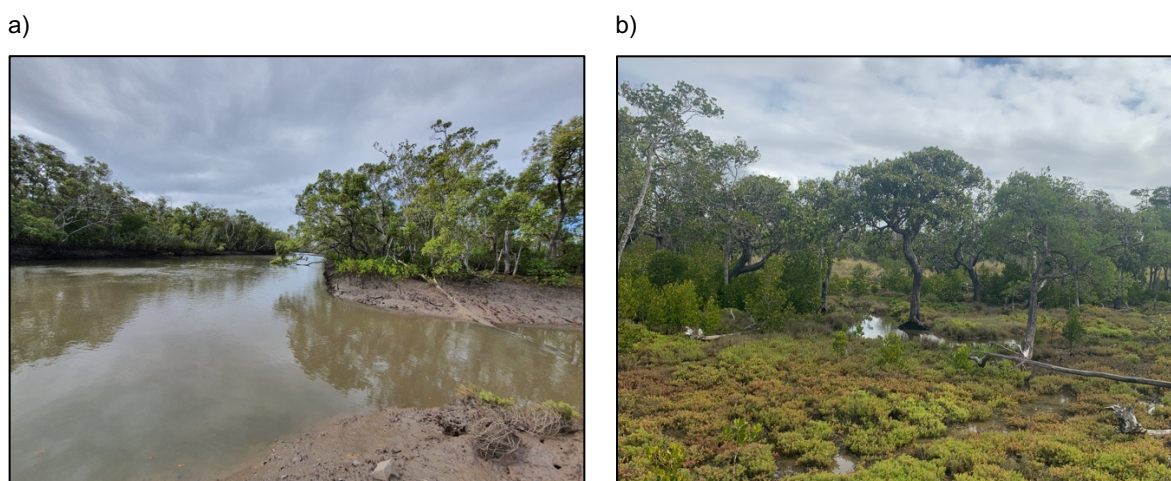


Figure 3.10 Mangroves on the PoB west property a) at Fairymead Creek at the north west corner of the property and b) mixed mangrove community including *B. gymnorhiza*

3.3.6 Saltmarsh within the Study Area

The ratio of mangrove to saltmarsh area in the estuary is relatively high (~72.5%), with saltmarsh plant diversity (eight species) (Table 3.1) and percent coverage typically low. Two functional saltmarsh / saltpan areas remain, located at Rubyanna Creek (upstream of the study area) and Burnett Heads (within the study area) (Duke et al. 2019b). These areas are likely to meet the criteria for the 'vulnerable' sub-tropical / temperate saltmarsh TEC under the EPBC Act (discussed further in Section 4.3). The remaining saltmarshes are predominately saltcouch (*Sporobolus virginicus*) saline grasslands, infrequently inundated by high tides (Duke et al. 2019b). Some of these areas may also meet the criteria for the saltmarsh TEC.

3.3.6.1 PoB Wetland

A survey of the PoB wetland in 2008 found that there are a number of saltmarsh communities associated with the mangrove communities around Wallace Creek, including on the sand ridges and in larger areas to the east and south of the mangroves (the area in the east also includes a large saltpan) (FRC 2008). There was also saltmarsh recorded in a paddock east to the PoB wetland, which had tidally inundated low-lying areas via a drain. Saltmarsh plants in the area include *S. virginicus*, sea purslane (*Sesuvium portulacastrum*), samphire (*Sarcocornia quinqueflora*), native sea lavender (*Limonium australe*) and seablite (*Suaeda australis*) (FRC 2008; Table 3.1).

In general, the saltmarsh areas within the PoB wetland were assessed as being in poor health, particularly the saltmarsh and saltpan areas to the east of Wallace Creek, due to disturbances from human activity (large amounts of rubbish and vehicles being driven over the areas), and in the case of the tidally inundated paddock, impacts from trampling and

grazing by domesticated horses (FRC 2008). In general, the condition of saltmarsh within the PoB wetlands during the May 2020 survey had improved since the 2008 survey; while there was still some evidence of vehicles driving over saltmarsh, the coverage and condition of saltmarsh was higher than that reported by FRC (2008) (Figure 3.11a).

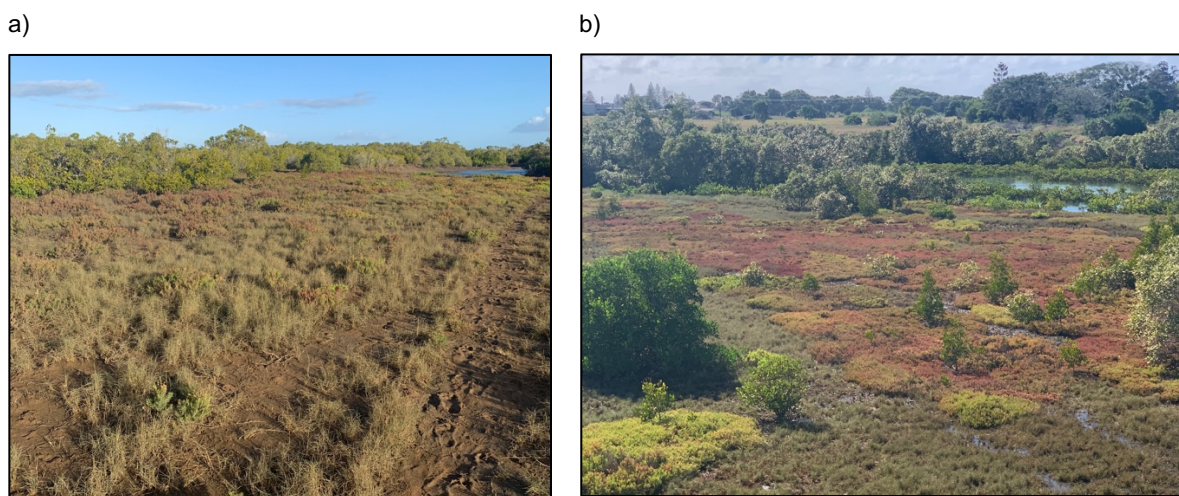


Figure 3.11 Saltmarsh associated with Wallace Creek a) adjacent to the lower reaches of Wallace Creek at Burnett Heads and b) at the north west corner of the MRA

3.3.6.2 MRA

Saltmarsh was present in association with the constructed channel around the MRA during a 2008 survey, with two tributaries of the constructed channel (to the east, outside of GPC-owned land) supporting saltmarsh with a high coverage of *S. virginicus*, *S. portulacastrum* and *S. australis*, in good condition (FRC 2008). These results were consistent with the May 2020 site inspection, with numerous saltmarsh areas noted adjacent to the MRA, including an extensive area of *S. virginicus*-dominated saltmarsh to the west of the MRA (outside of GPC-owned land) and several patches of saltmarsh to the north east (Figure 3.11b) and east of the MRA.

3.3.6.3 PoB South Property

As outlined in Section 3.2.1.3 above, the area of saltmarsh on the PoB south property along the Burnett River frontage is under-represented in the RE mapping. This saltmarsh is extensive (approx. 6.9 ha) and dominated by *S. virginicus*, with *S. australis* and *S. portulacastrum* with occasional *M. dealbata* and *C. glauca* trees in elevated areas and near the landward edge (Figure 3.12). The saltmarsh appeared to be regularly inundated by the tide and productive, with numerous crab burrows and molluscs observed.

3.3.6.4 PoB West Property

Saltmarsh areas on the PoB west property are also under-represented in the RE mapping (Figure 3.1). There is a large, extensive saltmarsh (approx. 4.5 ha), dominated by dense *S. virginicus*, adjacent to the Burnett River that is not shown on the RE map (Figure 3.13a & Figure 3.14). There are also mixed saltmarsh areas at the landward edge of the mangroves towards the west of the property (Figure 3.10b).

Tidal wetlands located on the PoB west property are proposed to be rehabilitated (Duke et al. 2019a). Works would aim to stabilise previously flood-eroded and retreating shorelines (Figure 3.13b), and the project is estimated to create and protect 7.4 ha of tidal wetland fish habitat and further benefit surrounding fish habitat, including saltmarsh communities.

a)



b)



Figure 3.12 Saltmarsh on the PoB south property a) saltpan and mixed saltmarsh looking north and b) *M. dealbata* with a *S. virginicus* understory

a)



b)



Figure 3.13 Saltmarsh on the PoB west property a) dense and extensive *S. virginicus*-dominated saltmarsh and b) steep and eroded bank of the Burnett River, looking south



Figure 3.14 Approximate location of extensive saltmarsh on the PoB west property that is not shown on the RE mapping

3.4 Seagrass and Macroalgae

Seagrass is one of the most important marine ecosystems in the broader Burnett-Mary region, providing food for threatened species, and food and habitat for fisheries of recreational and commercial importance. Seagrass meadows are also important for stabilising bottom sediments and as a carbon storage (GBRMPA 2014).

There are 15 species of seagrass common in Queensland, eight of which are known to occur within the Burnett-Mary region (Duke et al. 2019b). *Halodule uninervis*, *Zostera muelleri*, *Halophila ovalis*, *H. spinulosa* and *H. decipiens* are the most common species in the region, with *Z. muelleri* and *H. uninervis* dominating intertidal and coastal meadows (Coppo et al. 2014).

Seagrass meadows, as primary producers through photosynthesis, are generally found in intertidal and shallow subtidal environments, as turbidity and other restrictions to light availability limit seagrass growth in coastal environments (such as the study area) (Carruthers et al. 2002).

Consequently, water quality affects the ability for light to reach seagrass meadows and can negatively impact the health and productivity of seagrass meadows. Changes to water quality may occur naturally during extreme weather events (i.e. cyclones), seasonal fluctuations along with rainfall events, or by anthropogenic activity such as coastal development (including dredging), boat traffic, spills and dredged material deposition. Increased turbidity and sediment loads associated with these events can decrease light availability and water quality, and smother seagrass meadows over acute and chronic time frames – the degree of impact varying across species (Collier et al. 2016).

3.4.1 Seagrass Within the Study Area

Baseline data for seagrass in the Burnett River estuary is minimal (Moss et al. 2009). Further surveys are required to confirm the current presence, distribution, species composition and condition of seagrass in the estuary.

No intertidal and subtidal seagrass has been mapped within the waters of the Port limits (including the estuary mouth, nearshore coastal area and offshore waters) in DES' recent central Queensland intertidal and subtidal habitat mapping (Figure 3.6). The nearest mapped seagrass is located south, within the coastal waters of Hervey Bay (approximately 75 km south east). However, the central Queensland intertidal and subtidal habitat mapping was based on collating existing spatial data (DES 2019) i.e. it did not involve ground-truthing. It is therefore likely that the lack of seagrass mapped within the Port limits is due to a lack of previous seagrass surveys in this area.

No intertidal seagrass was noted at Burnett Heads during the site inspection in May 2020. However, seagrass has been recorded within the Port limits in historical surveys completed at the offshore dredged material placement area (referred to as the spoil ground in these historical surveys) (AMA 2015; Worley Parsons 2009b), as described below. Species that are often associated with seagrass habitat have been sighted in the coastal waters offshore of Bundaberg, including green turtles and dugong (*Dugong dugon*) (ALA 2020), although they are more commonly sighted further south in the waters of Hervey Bay (Sobtzick et al. 2017).

The PoB offshore dredged material placement area is located 4.32 nautical miles offshore from the mouth of the river in waters 10–13 m deep, and has undergone monitoring in accordance with the LTMMP. The most recent survey in early November 2015 showed seagrass was absent at all but one spoil ground survey site, where there was a sparse coverage of *H. spinulosa*. In contrast, a moderate to dense coverage of *H. ovalis* and *H. spinulosa* was present at sites adjacent to the spoil ground (AMA 2015). Seagrass was not recorded at the spoil ground sites or adjacent areas in March 2011 (Worley Parsons 2011). There was a sparse cover of *H. ovalis* and *H. spinulosa* at most spoil ground sites, and a

sparse to moderate cover of these species at sites adjacent to the spoil ground, in November 2008 (Worley Parsons 2009b).

The differences in the presence of seagrass at the spoil ground sites and surrounds is likely primarily related to environmental conditions driven by seasonal and inter-annual changes, as well as the deposition of dredge spoil at the dredged material placement area. The 2011 survey was completed in March, after significant rainfall and flooding had occurred during the summer. The 2011 flood event resulted in turbid plumes from the Burnett River affecting the dredged material placement area, and also meant that substantial maintenance dredging of silt deposited during the floods was required (Worley Parsons 2011). This increased the volume of spoil (over 800,000 m³) deposited at the spoil ground in that year (Worley Parsons 2011).

In contrast, the surveys in 2008 and 2015 were completed in spring, and did not occur after a major flood event (and therefore there was no increase in dredging associated with a flood event during these years). Differences in the coverage of seagrass among the different surveys could reflect the natural seasonal variability in seagrass coverage, and demonstrates the ability for pioneer species (such as *Halophila* spp.), which survive well in unstable or depositional environments (Carruthers et al. 2002), to recolonise the spoil ground after major events that can cause seagrass to decline.

No quantitative assessment of macroalgae has been recorded during the spoil ground surveys, but presence was recorded. The following species of macroalgae were observed at the spoil ground and surrounding survey sites in 2015: *Caulerpa taxifolia*, *C. cupressoides* var., *Udotea flatbellum*, *U. argentea*, *Codium* sp. and *Lobophora variegata* (AMA 2015). This was the first time that *C. cupressoides* var. was recorded in the spoil ground surveys (AMA 2015). although it is known from the region and has previously been recorded at Elliot Heads (DES 2020b).

3.5 Benthic Fauna

Benthic fauna are the organisms living within or on the benthic (substrate) surface of water bodies (i.e. streams, oceans, lakes). They are highly reliant on the surrounding environment and influenced by sediment type, water quality and hydrological factors. Consequently, they serve as good biological indicators of disturbance and monitoring of dominant species can reflect the overall aquatic health condition. Benthic fauna are important components of the ecosystem as they regulate sedimentation and nutrient dynamics (suspension feeders filtering suspended particles and bio-deposition), and are important constituents of fish and other marine fauna diets, among other services.

3.5.1 Port of Bundaberg Spoil Ground

The survey of benthic infauna in the PoB dredged material placement area in 2015 (referred to as the spoil ground in this survey) typically showed relatively low species richness and abundance compared to surrounding survey sites (AMA 2015). Surveys have consistently demonstrated that spoil deposition influences local infauna composition. In 2008, sites within the spoil ground that did not receive dredged material that season remained similar to non-spoil site infauna composition (Worley Parsons 2009b).

In 2015, taxa in the spoil ground were dominated by polychaetes from the families Eunicidae, Dorveliidae, Syllidae and Sabellidae; whereas dominant taxa of non-spoil ground sites were Eunicidae, Onuphidae and Maldanidae (AMA 2015). The general trend in functional group composition shows suspension and deposit feeders were dominant in the dredge material placement area, and predatory taxa were intermittently found across sites. However, the dominant taxa within each group varies across survey years (AMA 2015).

The study area is comprised of predominately coarse sand and mud sediment. The sediment of the spoil ground is influenced not only by deposition of dredged material, but also flood events flushing fine sediments offshore from the Burnett River estuary. Additionally, an increase in coarse sediment in the spoil ground may be attributed to flood events in 2011 and 2013, flushing coarse sediment from upstream to the estuary mouth and then being deposited at the spoil ground as part of maintenance dredging (AMA 2015).

In 2015, there was a positive correlation between fine sediment, infauna abundance and distance from spoil ground (AMA 2015). The relationship between sediment size and taxonomic composition is reflective of infauna habitat preference. Coarse sediment is thought to have a similar stabilising effect as seagrass and burrows, offering refuge for species such as crabs; whereas finer sediment is preferred by polychaetes and is typical for spoil ground composition sites (AMA 2015 and references cited therein).

3.6 Reef Communities

Reefs are one of the most biologically diverse ecosystems on the planet, providing food and shelter for a variety of species as well as providing other ecosystem services such as shoreline protection (GBRMPA 2014). Reefs are of value to recreational and commercial fisheries in the region that target: mackerel (*Scomberomorus* spp.); yellowfin bream (*Acanthopagrus australis*); snapper (*Pagrus auratus*); tarwhine (*Rhabdosargus sarba*) and yellowtail kingfish (*Seriola lalandi*) (Kirkwood & Hooper 2004). Reef communities in the area are a mix of tropical, subtropical and temperate species of hard and soft corals, with at least 46 species of hard coral known in the GSMP (DES 2018a).

Some of the southernmost reef communities in eastern Australia extend along the Woongarra Coast region of the GSMP which extends from the mouth of the Burnett River (just within the Port limits) south to Elliott Heads (DES 2018d), covering 2,500 ha and growing on rocky basalt outcrops (Figure 3.6, DES 2018a).

Inshore reef communities of the Burnett-Mary region are considered to be healthy but are threatened by sediment influx from surrounding catchments. Flooding from the Burnett and Mary rivers in 2011 and 2013 negatively impacted the surrounding coral reefs, reducing coral abundance by up to 60% from Woongarra Coast to the Great Sandy Strait (Butler et al. 2013; Coppo et al. 2014). Additionally, community composition and the location of coral reefs are somewhat driven by the fluctuation of sediment loads associated with different weather events (such as sediment-laden runoff associated with high rainfall or resuspension of sediment associated with high wave action), favouring dominant species and restricting reefs to coastal flats with less turbid waters. Typical coral composition in inshore reefs has seen an increase in the stress tolerant coral *Turbinaria*, a change from *Acropora* coral communities (Coppo et al. 2014).

3.7 Fish and Fisheries

Marine and estuarine environments in the Burnett-Mary region provide a range of habitat for a diverse array of fish species, with over 1,500 species being recorded (Kirkwood & Hooper 2004). There are no recent surveys of fish, crab or prawn species within the Burnett River estuary, other than incomplete data from recreational and commercial fishing efforts. However, the Burnett River estuary and inshore mudflats are considered to be of value to commercial fisheries, and are of high economic value to the region. An assessment of the fisheries resources in the Burnett River by Lupton & Heidenreich (1999) sampled a total of 101 estuarine fish species and 15 crustacean species. Half of the species found in the lower estuary are of economic importance, including:

- fan-tailed mullet, *Paramugil georgii*

- jewfish, *Argyrosomus hololepidotus*
- banana prawn, *Penaeus merguensis*
- bay prawn, *Metapenaeus bennettiae*
- king prawn, *P. plebijus*
- mackerel, *Scomberomorus* spp.
- bluefin tuna, *Thunnus tonggol*
- mangrove jack, *Butorides striata*
- barramundi, *Lates calcarifer*
- yellow-fin bream, *Acanthopagrus australis*
- flathead, *Platycephalus fuscus* and *P. indicus*
- whiting, *Sillago ciliata*, *S. maculata* and *S. analis*, and
- mud crabs, *Scylla serrata*.

The main species targeted by commercial fisheries within the Burnett River estuary is the banana prawn (*P. merguensis*) by beam trawling and otter trawling (DAF 2020).

Recreational fishing is common in the Wide Bay-Burnett region by local residents and tourists, particularly in the Burnett River estuary. Recreational fishing spots include the Bundaberg Port and Marina, the Burnett River estuary and inshore reefs, where spearfishing as well as line fishing is undertaken.

Sygnathids (family Sygnathidae containing pipefish and seahorses) are 'Listed Marine Species' under the EPBC Act due to their vulnerability to habitat destruction, trade and bycatch. They inhabit shallow coastal waters, mostly in seagrass meadows or floristic benthic communities including rocky reefs. Sygnathids are listed 'marine' species under the EPBC Act and are listed as potentially occurring in the PMST report (Appendix C). They are known to the Burnett-Mary Region and an incidental catch of an unknown seahorse species was reported in June 2019 by a recreational fisherman in the Burnett River¹.

3.8 Threatened and Migratory Species

3.8.1 Marine Mammals

Six threatened and migratory species are known or considered likely to occur in the study area (Table 3.2 and Appendix B) and are susceptible to impacts from anthropogenic activities (i.e. commercial tourism, boating and declining coastal water quality) (Coppo et al. 2014). These species are discussed in further detail below.

3.8.1.1 Whales

The humpback whale (*Megaptera novaeangliae*) migrates north from Antarctic waters, along the eastern coastline of Australia towards the Great Barrier Reef. It is the most commonly sighted cetacean in the Burnett-Mary region and is of high value to commercial tourism, with whale watching vessels operating out of the PoB and Hervey Bay. Humpback whales migrate within 20 km of the coastline, and stop to rest in Hervey Bay (approximately 65 km south east of Burnett Heads) on their southward migration. Consequently, during their migration (June to November) they are likely to be seen in the coastal waters off Burnett

¹ <https://www.bundabergnow.com/2019/06/19/seahorse-catches-fisherman/>

Heads and may traverse through the waters within the Port limits, including in the vicinity of the offshore dredged material placement area.

The southern right whale (*Eubalaena australis*) and the dwarf minke whale (*Balaenoptera acutorostrata*) (listed as a cetacean under the EPBC Act, Appendix C) are less well-known to the area, but have been recorded migrating through Hervey Bay (Coppo et al. 2014).

3.8.1.2 Dolphins

The Australian snubfin dolphin (*Orcaella heinsohni*) and the Australian humpback dolphin (*Sousa sahalensis*) are both coastal, estuarine and riverine species that are found in shallow coastline areas of Queensland. Little is understood about their population in the Bundaberg region, but both are known to the Great Sandy Straits (approx. 77 km to the south east). The snubfin dolphin has been sighted in the Burnett River estuary, upstream of the study area near the city of Bundaberg. There have been no sightings of the Australian humpback dolphin within the vicinity of the study area (DES 2020b). Other dolphin species, protected as cetaceans under the EPBC Act, also occur in the waters offshore of Bundaberg or further south in Hervey Bay or the Great Sandy Straits, including the Indo-Pacific (inshore) bottlenose dolphin (*Tursiops aduncus*), offshore bottlenose dolphin (*T. truncatus*), short-beaked common dolphin (*Delphinus delphis*) and Risso's dolphin (*Grampus griseus*) (DES 2020b).

3.8.1.3 Dugong

Dugong have been previously recorded offshore of Burnett Heads (Kirkwood & Hooper 2004) and a deceased female dugong (caused by propeller strike) was recorded in the Burnett River in 2013 (DEHP 2016a). The distribution and abundance of dugong is strongly related to the abundance of seagrass meadows. Within Queensland, the most important dugong habitat is the Hervey Bay Dugong Protection Area (DPA) (Coppo et al. 2014). It is approximately 1,700 km² in size and located approximately 75 km south east of the study area. Spatially-explicit modelling of dugong density, based on a time-series of aerial survey results, predicts that dugong are likely to occur in low to medium densities in the coastal waters offshore of Bundaberg, with high or very high densities predicted in the Hervey Bay DPA south of the PoB (Sobtzick et al. 2017).

3.8.2 Marine Turtles

Six of the world's seven marine turtle species have been recorded in the Burnett-Mary region. The coastal foreshore of the Bundaberg region is an important nesting area, with nesting occurring from November to January, and hatchlings generally emerging from January to March. The Mon Repos Conservation Park is located along the Woongarra Coast, approximately 4 km south of the Burnett River mouth. Mon Repos beach is approximately 1.5 km long and supports nesting of 20 or more marine turtles each night (mostly loggerheads) in the peak nesting season (December); it is the most significant rookery for nesting loggerhead turtles in the southern hemisphere (CBOB 2018; Limpus 2008). Three species of marine turtle have been recorded nesting along the Woongarra Coast: green turtle, flatback turtle (*Natator depressus*) and loggerhead turtle (*Caretta caretta*) (DES 2018b, QPWS 2020). The leatherback turtle (*Dermochelys coriacea*), hawksbill turtle (*Eretmochelys imbricata*) and olive ridley turtle (*Lepidochelys olivacea*) occur in the waters offshore of the PoB at times, but do not nest in the region.

The general life cycle of marine turtles is relatively similar between species (DES 2018). Marine turtles undertake large migrations during some stages of their life cycle (e.g. hatchling dispersal and breeding) yet have small geographic ranges (within 10 to 15 km of the coastline) during other parts of their life cycle e.g. foraging (Commonwealth of Australia 2017).

Hatchlings from Queensland beaches disperse throughout the major oceanic current systems of the Pacific Ocean (gyres) and can reach the east coast waters of South America.

During this drifting phase, post-hatchlings feed on planktonic species floating on the water's surface (DES 2018b).

Adult turtles show site fidelity to both their foraging and breeding areas. Resident sub-adult and adult turtles are known from Hervey Bay region, including the waters of the PoB (northern end of the region) (Sobtzick et al. 2017; Kirkwood & Hooper 2004). Spatially-explicit modelling of large marine turtle density, based on a time-series of aerial survey results, predicts that marine turtles are likely to occur in low to medium densities in the coastal waters offshore of Bundaberg (Sobtzick et al. 2017). Breeding adult turtles migrate to their nesting beaches from their distant foraging areas, up to 2,500 km away (DES 2018b).

3.8.2.1 Loggerhead Turtle

The loggerhead turtle occurs in coral and rocky reefs, seagrass meadows and muddy bays throughout the Australia coast. They are known to forage for benthic invertebrates including bivalves, gastropods, molluscs and crabs, and jellyfish, in shallow nearshore coastal waters (DES 2018b).

Queensland beaches have been identified as one of the major global nesting aggregations for loggerhead turtles, with the majority of nesting on the east coast of Australia occurring in southern Queensland. Major important nesting areas (rookeries) occur on the Woongarra Coast, Wreck Island, Tryon Island and Erskine Island (DES 2018b, Limpus 2008). Other significant rookeries include Heron, Masthead and Lady Musgrave islands and the Swains Reef cays (DES 2018b). More than 80% of the nesting beaches for loggerhead turtles in Queensland are within protected estates such as national parks and conservation parks (DES 2018b).

Female turtles do not nest every year, with the number of years between recorded breeding seasons thought to be between 1–8 years for loggerhead turtles (Limpus 2008). Females typically lay several clutches of eggs in a nesting season (DES 2018b). The inter-nesting interval is around 14 days, during which time the female turtle will remain relatively close to the nesting beaches. Subsequent nests are typically at the same beach / region as the first, although in some cases females have laid eggs on more than one beach, with a few hundred kilometres between beaches (DES 2018b).

The most significant rookery for nesting loggerhead turtles in the southern hemisphere is located at Mon Repos (Limpus 2008). The Woongarra Coast supports 50% of the annual loggerhead breeding in eastern Australia, with 383 nesting females recorded in the 2019–2020 nesting season (QPWS 2020) and 382 nesting females recorded in the 2018–2019 nesting season (Limpus et al. 2019). In the 2018–2019 season, an average of 3.8 clutches were laid per female loggerhead turtle, with a total of 1439 clutches recorded (Limpus et al. 2019). Active intervention occurs along the Woongarra Coast including the relocation of egg clutches to predator exclusion zones and shaded rookeries. Approximately 29% of clutches had greatly reduced hatchling production due to canine predation, erosion, heatwaves, nest disturbance by other nesting turtles and flooding events. There was a low nesting success for the 2019 season with many turtles returning to the sea without laying eggs (Limpus et al. 2019).

Inter-nesting habitat within the study area includes the coastal waters of the GSMP. Zoning of the marine park provides for a seasonal closure to trawling during the turtle nesting season (Limpus 2008). The dredged navigation channel of the PoB has been demonstrated to be inter-nesting habitat for female loggerhead turtles nesting at Mon Repos (Figure 3.15; DES 2020m). Dredging does not generally occur in the turtle nesting season.

Beaches in the important nesting areas such as Mon Repos, including a 20 km wide inter-nesting buffer extending offshore of the beaches, are considered under the *Recovery Plan for Marine Turtles in Australia* to be 'critical habitat' for the south-west Pacific population of loggerhead turtles from October to March each year (Commonwealth of Australia 2017).

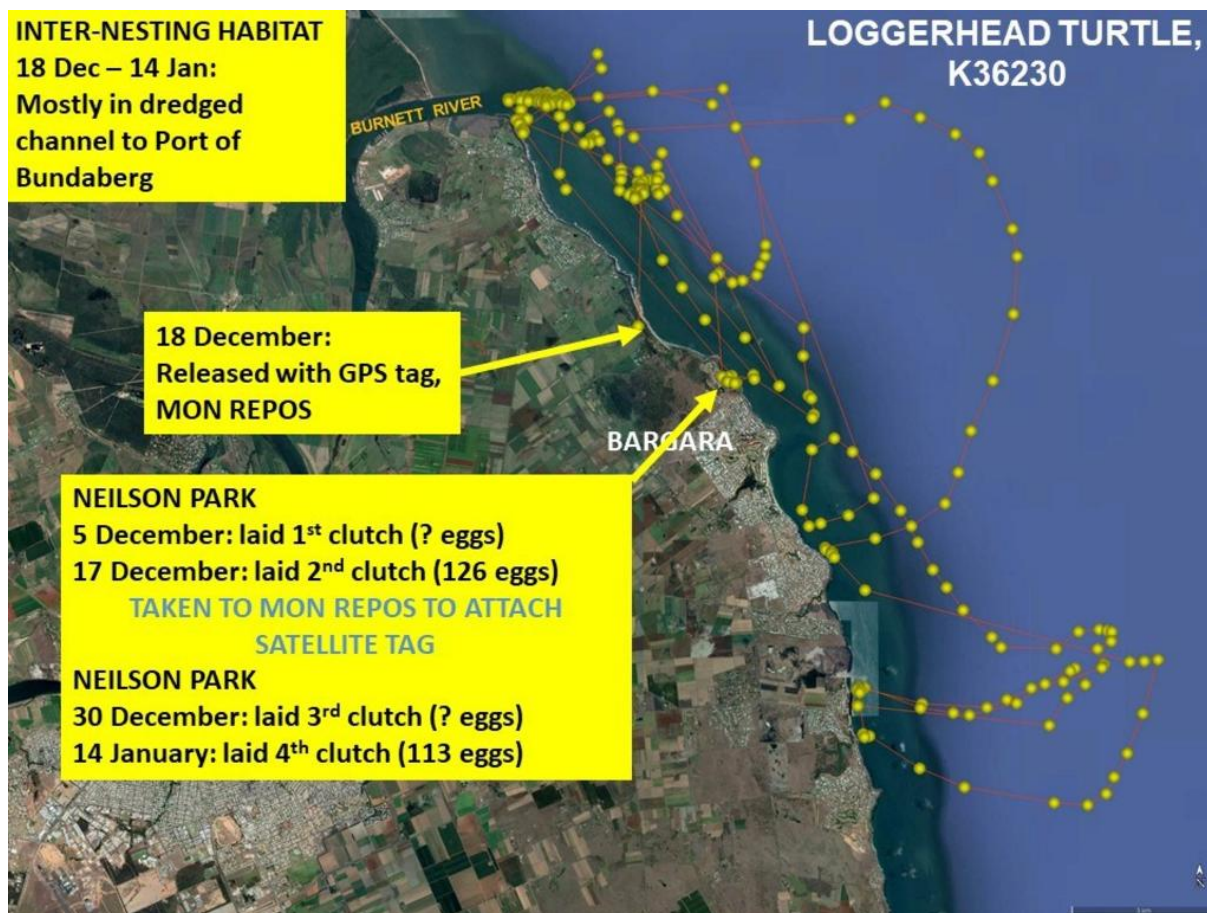


Figure 3.15 Satellite tracking data from loggerhead turtle K36230 during the 2019–2020 nesting season (DES 2020m)

3.8.2.2 Green Turtle

The green turtle mainly occurs in tropical and subtropical waters throughout northern Australia. Green turtles are almost entirely herbivorous, feeding on seagrass, algae and mangrove fruits; although they occasionally feed on microplankton (Limpus 2009). Green turtles prefer shallow benthic foraging habitats, including coral reefs and inshore seagrass meadows. In the past, there have been incidents of green turtle strike during dredging of the navigation channel at the PoB (Pascoe, J. [GPC], pers. comm. May 2020), which occurs outside of the turtle breeding season. This suggests that green turtles may be resident and forage in the study area. This is consistent with the outcomes of aerial surveys and spatially-explicit modelling, which predicted that a 'medium' density of adult marine turtles is likely to occur in the waters offshore of Bundaberg, though the modelling was not specific to the species of turtle present (Sobtzick et al. 2017). Higher densities of adult turtles are predicted in Hervey Bay and the Great Sandy Strait, south of the PoB (Sobtzick et al. 2017).

Major rookeries for the southern GBR stock of green turtles occur on the islands of the Capricorn Bunker Group, including at Lady Musgrave Island, approx. 95 km north of the PoB. Minor breeding aggregations occur on mainland beaches, including the coastline from Bustard Head to Bundaberg (Limpus 2008). Only one nesting green turtle was recorded at Mon Repos in each of the 2018–2019 and 2019–2020 breeding seasons (QPWS 2020; Limpus et al. 2019). The green turtle recorded in the 2018–2019 season laid 5 clutches (Limpus et al. 2019).

3.8.2.3 Flatback Turtle

The flatback turtle typically occurs in tropical waters of northern Australia, feeding on soft-bodied invertebrates such as soft corals, sea pens, holothurians and jellyfish (Limpus 2007).

They typically forage in the soft-bottomed habitat of coastal waters, and nest in inshore islands and coastal beaches (Limpus 2007).

A small number of flatback turtles nest along the Woongarra Coast, with Mon Repos considered a minor rookery (Limpus 2007). There were 10 nesting flatback turtles recorded at Mon Repos in the 2019–2020 season (QPWS 2020) and 5 nesting flatback turtles recorded in the 2018–2019 season (Limpus et al. 2019). A total of 17 clutches were recorded in the 2018–2019 season (Limpus et al. 2019).

3.8.3 Estuarine Crocodile

The estuarine crocodile (*Crocodylus porosus*) is known to inhabit coastal waters, estuaries and inland swamps and marshes and may occur in the study area.

The Bundaberg region is listed as Zone F (Atypical Habitat Zone) under the Queensland Crocodile Management Plan (DEHP 2017). This zone identifies the risk of human-crocodile interaction as low as Bundaberg is beyond their typical range, and there is a management response for targeting removal of all individuals in the area.

Although infrequent, there have been reported sightings of estuarine crocodiles in the Burnett River and within the broader Burnett-Mary region (e.g. they are known from the Mary River, approximately 90 km south of the Burnett River). The most recent reported sighting was in the Sandy Hook area of the Burnett River in January 2020, although the sighting has not been confirmed by DES (DES 2020I).

3.8.4 Shorebirds and Migratory Birds

The east coast of Australia and its intertidal wetland habitat is important feeding and roosting habitat for migratory shorebirds travelling along the East Asian – Australasian Flyway. These migratory shorebirds, in addition to resident shorebirds, frequent tidal wetlands in the region and are protected under international agreements such as the Japan (JAMBA), China (CAMBA) and Republic of Korea – Australia Migratory Bird Agreements (ROKAMBA), and the Ramsar Convention on Wetlands (Queensland Government 2015).

Known groups from the Burnett-Mary region include members of the Charadriidae family (plovers), the Scolopacidae family (sandpipers and curlews) and the Laridae family (noddies, gulls and terns), and include nationally listed threatened and migratory species under the EPBC Act (Table 3.2).

Within the study area there are three important wetland areas for shorebird species; Barubbra Island at the mouth of the Burnett River, the Burnett Heads coastline and the PoB wetland and MRA (Worley Parsons 2012).

The MRA at the PoB is an area of interest to local bird watching groups. The Birdlife Bundaberg group and BMRG completed 15 surveys between April 2017 and September 2019 (data provided by GPC, with collated data presented in Appendix A). They have recorded 42 shorebirds (waders and terns) in the PoB area, including 22 species listed as either threatened or migratory under the EPBC Act (Appendix A). The most abundant species across all surveys were the bar-tailed godwit (*Limosa lapponica*), curlew sandpiper (*Calidris ferruginea*), black-winged stilt (*Himantopus himantopus*), eastern curlew (*Numenius madagascariensis*), red-capped plover (*Charadrius ruficapillus*), sharp-tailed sandpiper and terns (particularly the whiskered tern, *Chlidonias hybrida*) (Appendix A). Of these, the curlew sandpiper and eastern curlew are listed as critically endangered under the EPBC Act, and endangered under the NCA. The red knot (*Calidris canutus*), listed as endangered under the EPBC Act and NCA, has also been recorded at the MRA (Appendix A). An additional six species listed as threatened or migratory under the EPBC Act, or as threatened under the NCA, are also considered known or likely to occur in the study area based on the Wildlife

Online (DES 2020a), Atlas of Living Australia (ALA 2020) and Birddata (Birdlife Australia 2020) searches (Table 3.2; Appendices B & C).

Other threatened or migratory birds have also been previously recorded within the study area (ALA 2020), including frigatebirds (*Fregata* sp.), white-throated needletail (*Hirundapus caudacutus*), fork-tailed swift (*Apus pacificus*) and the wandering albatross (*Diomedea exulans*) (Table 3.2). However, the occurrence of these species is likely to be as rare flyovers, and they are unlikely to be reliant on habitats within the study area.

3.8.5 Terrestrial Species

The grey-headed flying fox (*Pteropus poliocephalus*) is Australia's only endemic flying fox species and is listed as vulnerable under the EPBC Act. While it is not listed as threatened in Queensland, it is listed as critical under the 'Back on Track' species prioritisation framework and is considered by the State to be of conservation significance. The species is relatively nomadic across its distribution, selectively foraging where native trees are fruiting. Flowering eucalypts (genera *Eucalyptus*, *Corymbia* and *Angophora*), melaleucas and banksias make up the primary food source for the species.

Tall mangrove forests can attract displaced flying-fox colonies. However, roosting behaviour causes physical damage to mangrove trees and is a natural driver of change in mangrove ecosystems (Mackenzie & Duke 2011). In the Burnett-Mary region, the flying fox is the most common wildlife utilising mangroves as roosting sites. There is a grey-headed flying fox camp (roosting colony) located within the mangrove forests on Flying Fox Island in the Burnett River, upstream of the study area, and camps are also known from Bargara to the south of the PoB and Moore Park to the north (DES 2020b; DEHP 2016b).

The water mouse (*Xeromys myoides*), listed as vulnerable under the EPBC Act and the NCA, has the potential to occur in the study area. The species inhabits mangroves (i.e. *A. marina*, *R. stylosa*) and their associated saltmarsh, sedgeland, heathlands and freshwater wetlands in estuarine environments. They nest within the tidal zone, constructing mounds at the base of mangrove trees, holes in supralittoral banks or nesting inside natural or man-made hollows. Although there are no published records of the water mouse occurring within the study area, potential habitat is abundant, including on PoB land. While no evidence of water mouse was noted during the May 2020 site inspection, potential habitat (i.e. saltmarsh adjacent to mangroves) occurs at the PoB wetlands and PoB west property. The MRA and PoB south property are unlikely to support water mouse based on the habitat available (i.e. lack of substantial mangrove forests).

Table 3.2 Listed threatened and migratory species known or considered likely to occur in the study area (from Appendix B)

Species	Common Name	Status under EPBC Act ¹	Status Under NCA ²
Mammals			
<i>Dugong dugon</i>	dugong	M, O	V
<i>Eubalaena australis</i>	southern right whale	E, C	LC
<i>Megaptera novaeangliae</i>	humpback whale	V, M, C	V
<i>Orcaella heinsohni</i>	Australian snubfin dolphin	M, O, C	V
<i>Sousa sahalensis</i>	Australian humpback dolphin	M, O, C	V
<i>Pteropus poliocephalus</i>	grey-headed flying fox	V	LC

Species	Common Name	Status under EPBC Act ¹	Status Under NCA ²
<i>Xeromys myoides</i>	water mouse	V	V
Reptiles			
<i>Chelonia mydas</i>	green turtle	V, M, O	V
<i>Caretta caretta</i>	loggerhead turtle	E, M, O	E
<i>Dermochelys coriacea</i>	leatherback turtle	E, M, O	E
<i>Lepidochelys olivacea</i>	olive ridley turtle	E, M, O	E
<i>Natator depressus</i>	flatback turtle	V, M, O	V
<i>Crocodylus porosus</i>	estuarine crocodile	M, O	V
Shorebirds and Sea Birds			
<i>Anous stolidus</i>	common noddy	M	SL
<i>Arenaria interpres</i>	ruddy turnstone	M, O	SL
<i>Esacus magnirostris</i>	beach stone-curlew	O	V
<i>Charadrius bicinctus</i>	double-banded plover	M, O	SL
<i>Caharadrius leschenaultii</i>	greater sand plover	V, M, O	V
<i>Charadrius mongolus</i>	lesser sand plover	E	E
<i>Charadrius veredus</i>	red-kneed dotterel	M, O	SL
<i>Calidris acuminata</i>	sharp-tailed sandpiper	M, O	SL
<i>Calidris canutus</i>	red knot	E, M, O	E
<i>Calidris ferruginea</i>	curlew sandpiper	CE, M, O	E
<i>Calidris tenuiristris</i>	great knot	CE, M, O	E
<i>Calidris falcinellus</i>	broad-billed sandpiper	M, O	SL
<i>Calidris ruficollis</i>	red-necked stint	M, O	SL
<i>Chlidonias leucopterus</i>	white-winged black tern	M, O	SL
<i>Gallinago hardwickii</i>	Latham's snipe	M, O	SL
<i>Gelochelidon nilotica</i>	gull-billed tern	M, O	SL
<i>Hydroprogne caspia</i>	Caspian tern	M, O	SL
<i>Limosa lapponica baueri</i>	western Alaskan bar-tailed godwit	V	V
<i>Limosa lapponica menzbieri</i>	bar-tailed godwit (menzbieri)	CE	E
<i>Limosa limosa</i>	black-tailed godwit	M, O	SL

Species	Common Name	Status under EPBC Act ¹	Status Under NCA ²
<i>Numenius madagascariensis</i>	eastern curlew	CE, M, O	E
<i>Numenius phaeopus</i>	whimbrel	M, O	SL
<i>Pluvialis fulva</i>	Pacific golden plover	M, O	SL
<i>Pluvialis squatarola</i>	grey plover	M, O	SL
<i>Rostratula australis</i>	Australian painted snipe	E, O	E
<i>Sternula albifrons</i>	little tern	M, O	SL
<i>Thalasseus bergii</i>	crested tern	M, O	SL
<i>Tringa nebularia</i>	common greenshank	M, O	SL
<i>Tringa stagnatilis</i>	marsh sandpiper	M, O	SL
<i>Apus pacificus</i>	fork-tailed swift	M, O	SL
<i>Hirundapus caudacutus</i>	white-throated needletail	V, M, O	V
<i>Fregata ariel</i>	lesser frigatebird	M, O	SL
<i>Fregata minor</i>	great frigatebird	M, O	SL
<i>Diomedea exulans</i>	wandering albatross	V, M, O	V

¹ Status under the EPBC Act: E: endangered; V: vulnerable; M: migratory; C: cetacean; O: marine.

² Status under the NCA: E: endangered; V: vulnerable; SL: special least concern.

3.9 Marine Water Quality

3.9.1 Coastal Waters

No EVs or WQOs have been scheduled under the EPP (Water and Wetland Biodiversity) for the Burnett Basin or the coastal waters offshore.

EVs and WQOs for the coastal waters of Hervey Bay are scheduled under the EPP Water and Wetland Biodiversity. These waters are located outside the Port limits but within the study area. The study area includes designated HEV waters extending south of Burnett Heads to Elliot Heads (area Hervey Bay 1 (HB1); refer to Figure 5.2 in Section 5), with moderately disturbed waters further seaward (DERM 2010).

EVs selected for protection in Hervey Bay open coastal waters include:

- aquatic ecosystems
- seagrass
- aquaculture
- human consumer
- primary recreation

- secondary recreation
- visual recreation, and
- cultural and spiritual values.

WQOs scheduled under the EPP (Water and Wetland Biodiversity) are outlined in Table 3.3.

Table 3.3. WQOs set to protect environmental values in coastal waters of Hervey Bay, area WQ1372 (DERM 2010)

Water Quality Parameter	Water Quality Objective	
	Hervey Bay HEV area HB1 ¹	Other Hervey Bay open coastal waters
turbidity (NTU)	0 – 1 – 2	<2
total suspended solids (mg/L)	2 – 4 – 11	<11
chlorophyll a (µg/L)	0.5 - 0.6 - 0.8	<0.8
total nitrogen (µg/L)	110 – 113 – 150	<150
oxidised N (µg/L)	2 – 2 – 2	<2
ammonia N (µg/L)	2 – 6 – 9	<9
organic N (µg/L)	98 – 100 – 140	<140
total phosphorus (µg/L)	6 – 10 – 14	<14
filterable reactive phosphorus (FRP) (µg/L)	2 – 2 – 3	<3
dissolved oxygen (% saturation)	90 – 95 – 105	90 – 105
pH	8.1 – 8.2 – 8.4	8.1 – 8.4

¹ HEV area Hervey Bay 1; WQO set to maintain water quality within existing range – 20th, 50th, 80th percentiles are presented.

3.9.2 Burnett River Estuary

EVs and WQOs have not been scheduled for the Burnett Mary Region under the EPP (Water and Wetland Biodiversity). However, the WQIP for the Burnett-Mary region lists the following EVs for the Burnett River estuary (BMRG 2015):

- aquatic ecosystems
- human consumer
- primary recreation
- secondary recreation
- visual recreation
- industrial use, and
- cultural and spiritual values.

The WQIP also outlines draft interim WQOs for the Burnett River estuary and enclosed coastal waters (Table 3.4) and waters offshore of the Burnett River, which are taken from the WQOs for Area HEV HB1 as shown in Table 3.3.

Table 3.4. Draft interim WQOs for the estuary and enclosed coastal waters of the Burnett River (BMRG 2015)

Water Quality Parameter	Water Quality Objective		
	Upper estuary	Mid estuary	Lower estuary and enclosed coastal waters
turbidity (NTU)	<25	<8	<6
total suspended solids (mg/L)	<25	<20	<15
chlorophyll a (µg/L)	<10	<4	<2
total nitrogen (µg/L)	<450	<300	<200
oxidised nitrogen (µg/L)	<15	<10	<3
ammonia nitrogen (µg/L)	<30	<10	<8
organic nitrogen (µg/L)	<400	<260	<180
total phosphorus (µg/L)	<40	<25	<20
filterable reactive phosphorus (FRP) (µg/L)	<10	<8	<6
dissolved oxygen (% saturation)	70 – 105	85 – 105	90 – 105
pH	7.0 – 8.4	7.0 – 8.4	8.0 – 8.4

The Burnett River estuary has been extensively modified by urban, agricultural and industrial development. Development of the Ben Anderson barrage in 1976 and further alterations to the river mouth have changed the hydrology of the river and increased sediments loads. Additionally, bank erosion is the largest contributor of sediment in the river (BMRG 2015). The estuary is defined as having low sediment trapping efficiency, naturally high turbidity and is well circulated.

After the Mary River (the largest contributor of anthropogenic loads in the Burnett-Mary region), the Burnett River contributes the second highest load of dissolved inorganic nitrogen, particulate phosphorus, dissolved inorganic phosphorus and particulate nitrogen to the coastal waters of the region (BMRG 2015).

The catchments of the Burnett-Mary region are part of the Great Barrier Reef catchments. As such, they are included in the Reef 2050 Water Quality Improvement Plan (WQIP) for 2017–2022 (State of Queensland 2018). The Reef 2050 WQIP sets whole-of-reef targets for reducing sediment and nutrient loads being export to the reef. These targets have been further divided between regions, and catchment targets have been set. There are specific end-of-catchment anthropogenic water quality targets for the Burnett River catchment (Table 3.5). The reduction of fine sediment, particulate phosphorus and particulate nitrogen loads exported from the Burnett River catchment are considered to be a medium management priority (Table 3.5).

Table 3.5 WQOs for anthropogenic load reductions to be achieved by 2025 from 2013 baseline relating to the Burnett River catchment (State of Queensland 2018)

Water Quality Parameter	Relative Priority	End-of-catchment WQO (tonnes)
dissolved inorganic nitrogen (DIN)	low	150 (70%)
fine sediment (FS)	moderate	85,000 (20%)

Water Quality Parameter	Relative Priority	End-of-catchment WQO (tonnes)
particulate phosphorus (PP)	moderate	29 (20%)
particulate nitrogen (PN)	moderate	68 (20%)

3.10 Cultural and Heritage Values

3.10.1 Local Heritage

There are several local heritage places identified within the study area under the Planning Scheme (BRC 2020), including the:

- St John the Divine Anglican Church, 1 Paul Mittelheuser Street, Burnett Heads – architectural and spiritual significance
- Old Burnett Heads Lighthouse, 19 Zunker Street, Burnett Heads – architectural, historical and cultural significance, and
- New Burnett Heads Lighthouse, off Lighthouse Street, Burnett Heads – aesthetic and historical significance.

3.10.2 Aboriginal Heritage

Tidal wetlands are culturally important for Traditional Owners of sea country in the Burnett-Mary Region. Many middens occur adjacent to tidal wetlands in the area. These areas were focal meeting places, gathering to hunt fish, crabs and shellfish. Mangroves provided a resource as they were commonly used to make canoes and medicine; and the sap from the milky mangrove (*E. agallocha*) was used to poison fish (Mackenzie & Duke 2011).

Based on a database held by GPC (GPC 2017), there are two Aboriginal heritage items listed within PoB-owned land:

- a resource area with shell middens and weir/fish trap, and
- a burial site, which is located within the conservation land use zone and the resource area within leasehold land.

The Traditional Owner rangers (Gidjarjil Development Corporation) and local citizens of the Port Curtis Coral Coast (PCCC) Traditional Use of Marine Resources Agreement (TUMRA) area are actively involved in the monitoring and restoration of estuarine resources along the coast from Port Alma south to Burrum Heads, including the study area (Duke et al. 2019a). GPC are working with the Gidjarjil Development Corporation to develop a walk through the PoB wetlands, utilising one of the elevated sand ridge areas and by constructing boardwalks across the mangroves (Figure 3.16).

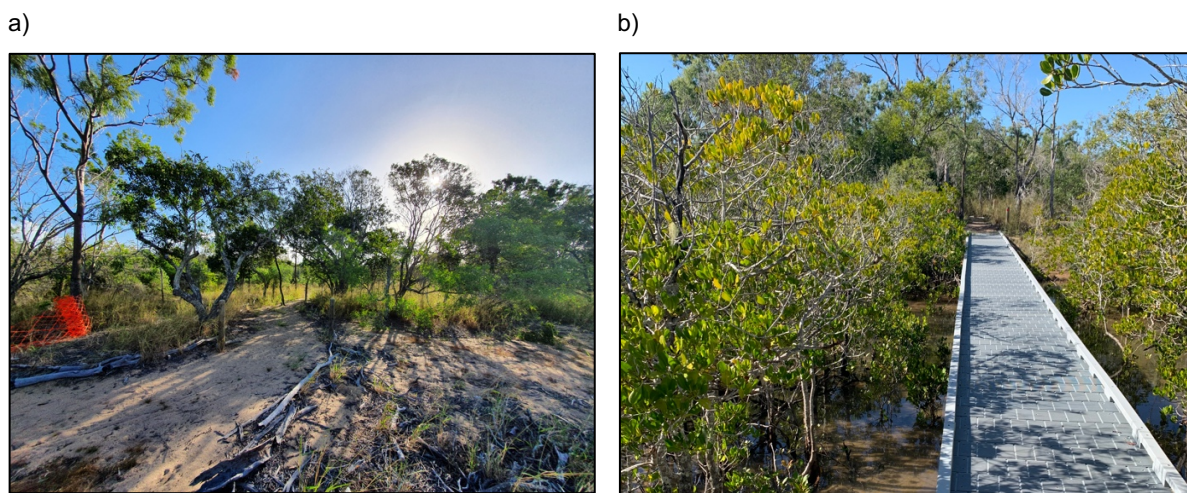


Figure 3.16 Trail through the sand ridges and mangroves at the PoB wetlands a) path along elevated sand dune b) boardwalk crossing of mangroves

3.11 Social Values

The Burnett River has value in its recreational use, commercial use and industrial use. BRC have reported that its natural assets are estimated to generate \$201 million per year.

As one of Queensland’s strategic ports, the PoB provides shipping facilities for imports and exports of the Wide Bay Burnett Region. It is largely associated with the shipping of bulk raw sugar and similar sugar-related products from the Bundaberg sugar industry.

The Bundaberg Port Marina is of high value as a ‘Southern Gateway to the Great Barrier Reef’ and surrounds. In particular, vessel transfers to Lady Musgrave Island depart from the PoB. Many tourism operators run from the port and as one of the most popular ports of entry to Australia (customs clearance service present), the marina attracts many national and international boaters (yachts, cruise boats, etc.).

Recreationally, the Port of Bundaberg is valued by boaters, fishermen, locals and tourists. The Bundaberg Sailing Club is located 6 km upstream of the river mouth on PoB land, with sailing races occurring in both the river and ocean. The Bundaberg Port Marina is a popular recreational fishing spot and also provides access to the river and ocean for boaters. The marina also offers retail, food and beverage services. Residential areas are nearby and include the port township and Burnett Heads.

More generally within the study area, Mon Repos is a significant tourist drawcard, with large numbers of tourists visiting during the turtle nesting and hatching season. Visitors and local residents are also attracted to the many sandy beach areas along the coastal fringe of the study area, where recreational activities such as walking, swimming, surfing, paddle boarding, kite surfing and kayaking are popular (DES 2018d).

4 Matters of National Environmental Significance (MNES)

4.1 Protected Areas

The GBRWHA, GBRMP and Great Barrier Reef National Heritage Place are MNES. The Port limits are outside of these protected areas. The Port limits are approximately 18 km south of the boundary of these areas (Figure 4.1).

The Port limits are approximately 60 km east of Fraser Island, which is a World Heritage Area and National Heritage Place (Figure 4.1).

4.2 Wetlands of International Importance (Ramsar Wetlands)

There are no wetlands of international importance in the vicinity of the PoB. The closest is the Great Sandy Strait Ramsar wetland, approximately 76 km south east of the mouth of the Burnett River (Figure 4.1).

4.3 Listed Threatened Ecological Communities (TECs)

Two TECs listed under the EPBC Act are likely to occur in the vicinity of the PoB:

- Coastal swamp oak (*C. glauca*) forest of New South Wales and South East Queensland (endangered), and
- Subtropical and temperate coastal saltmarsh (vulnerable).

The lowland rainforest of subtropical Australia (critically endangered TEC) is also within the PMST report (Appendix C); however, this TEC does not occur within the study area; the nearest primary location is in Maryborough approximately 100 km south.

4.3.1 Coastal Swamp Oak Forest

In Queensland, the coastal swamp oak forest (*C. glauca*) TEC equates to two REs; 12.1.1 (of concern) and 12.3.20, where the canopy is dominated by *C. glauca* (endangered). A patch of RE 12.1.1 (*C. glauca* woodland on margins of marine clay plains), is located within the study area but outside of GPC-owned land, to the west of Barubbra Island (Figure 4.2). This community has value as estuarine wetland habitat (DoEE 2018, DoEE 2020).

Patches of *C. glauca* must meet the relevant key diagnostics and condition thresholds outlined in the conservation advice in order to be considered a TEC (DoEE 2018). Small, isolated patches (<0.5 ha), or medium patches (2–5 ha) that are subject to high disturbance and that have a non-native ground layer may not meet the condition thresholds for national protection (but could be prioritised for management and recovery projects) (DoEE 2018).

The patch to the east of Barubbra Island is approximately 1.4 ha in size, and may meet the criteria for the coastal swamp oak forest TEC if it has a predominantly native understorey. This patch is not within PoB-owned land and was not assessed during the site inspection.

Small patches of *C. glauca* were noted during the site inspection in each of the areas inspected (PoB wetlands, adjacent to the MRA, PoB south property and PoB west property). However in all cases, patches are <0.5 ha in size and therefore do not meet the criteria for the coastal swamp oak forest TEC.

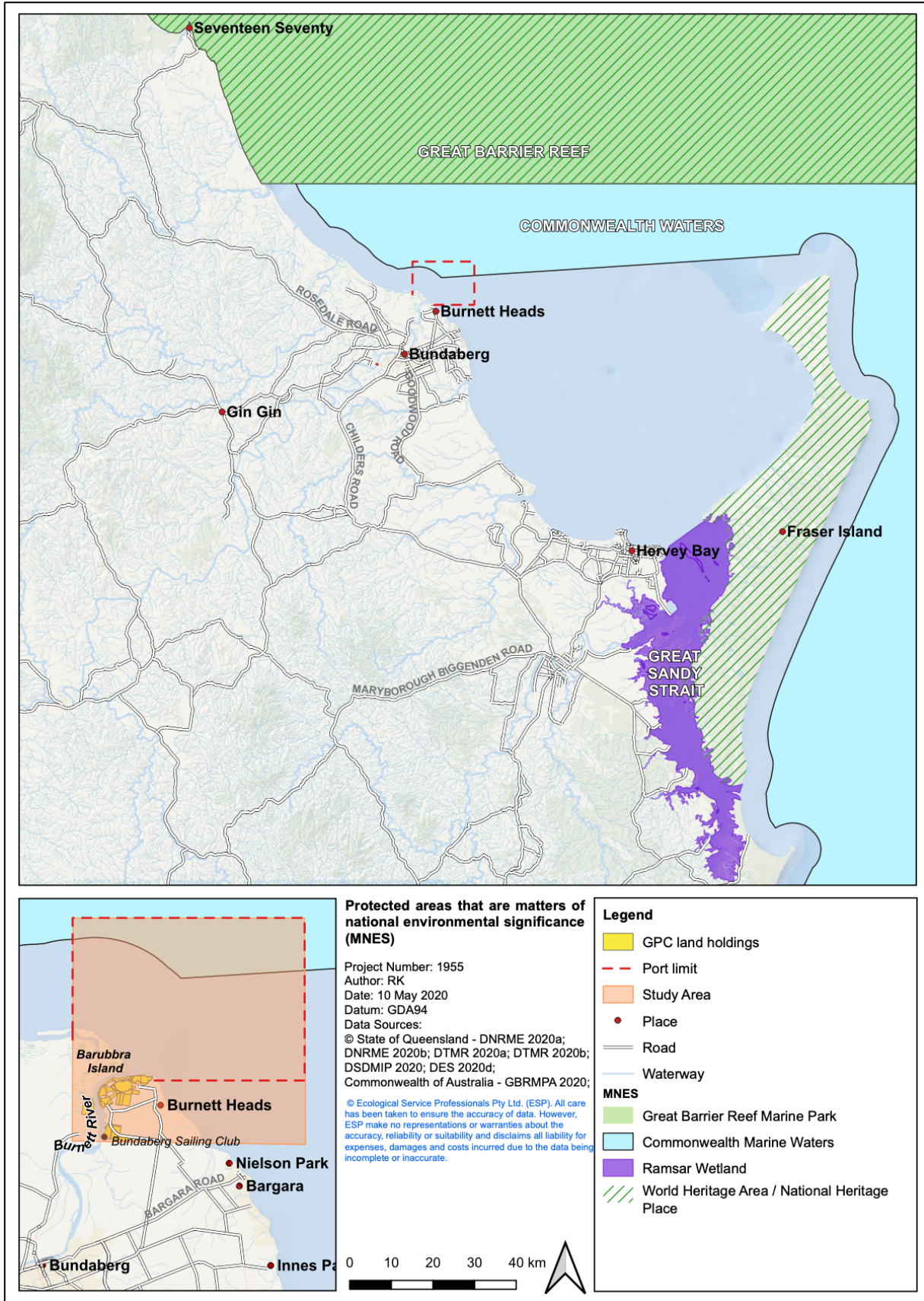


Figure 4.1 MNES protected areas in the vicinity of the study area

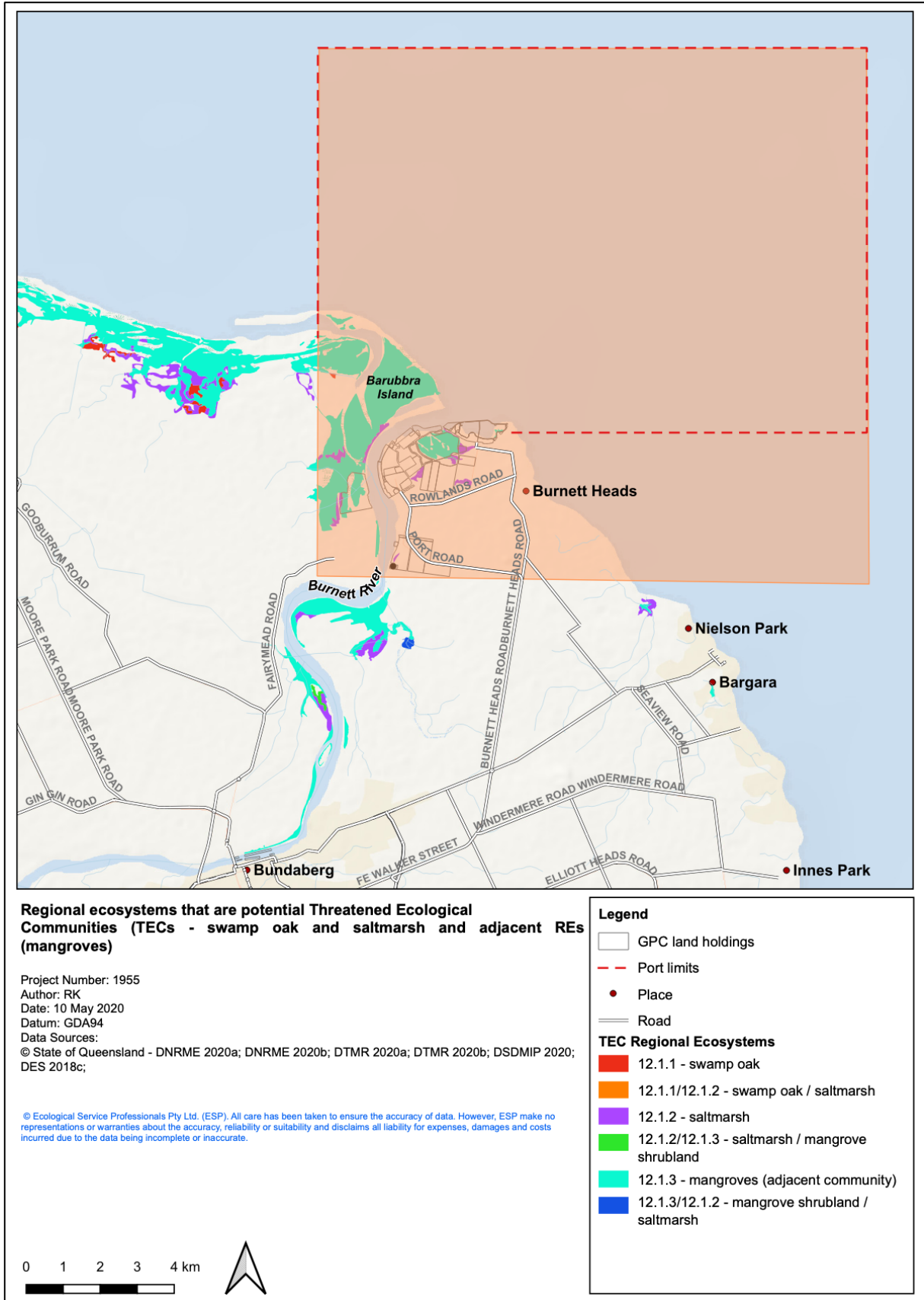


Figure 4.2 Queensland Government mapping of REs for potential TECs and adjacent / intergrading communities

4.3.2 Coastal Saltmarsh

In south east Queensland, the saltmarsh TEC equates to the RE 12.1.2, saltpan vegetation including grassland and hermland on marine clay pans. This RE is confined to land zone 1 (tidal flats and beaches) and has a status of 'least concern' under the VMA.

Subtropical/temperate saltmarsh communities have value as they provide habitat for threatened fauna species including migratory shorebirds and the water mouse (*X. myoides*, Section 3.8) particularly in areas immediately adjacent to mangroves, RE 12.1.3 (DSEWPaC 2013; DoEE 2020). This RE is mapped within the Port limits, located along the Burnett River (northern side) and within the PoB wetland area (Figure 4.2). Additional saltmarsh areas, not included in the RE mapping, were found on the PoB south property and PoB west property during the site inspection (Sections 3.2 & 3.3). Saltmarsh must meet the following conditions to be considered a TEC (DSEWPaC 2013):

- where the community intergrades with an adjacent community such as mangrove, paperbark, swamp oak or freshwater marshes, it must have 50% or more of the ground cover comprised of coastal saltmarsh species
- must have tidal connection, and
- minimum patch size >0.1 ha (but small areas can be connected by bare saltpan to form a patch).

Based on the RE mapping and the outcomes of the site inspection, a number of areas of saltmarsh and saltpan in the study area meet the criteria for this TEC, including the following areas on GPC-owned land (Section 3.3.6; Figure 4.2; Figure 3.4 & Figure 3.14):

- most saltmarsh patches associated with the PoB wetlands and adjacent to the MRA
- the large area of saltmarsh identified during the site inspection on the Burnett River frontage PoB south property, and
- the large saltmarsh area identified during the site inspection on the Burnett River frontage of the PoB west property, along with other saltmarsh areas associated with the mangroves of Fairymead Creek towards the west of the property.

4.4 Listed Threatened Species

The results of the likelihood of occurrence assessment for threatened species identified as potentially occurring in the PMST are provided in Appendix B and summarised in Table 3.2. In summary, 20 listed threatened species under the EPBC Act are known or considered likely to occur within the study area, including:

- Critically Endangered
 - curlew sandpiper, *C. ferruginea*
 - great knot, *C. tenuirostris*
 - bar-tailed godwit (menzbieri), *L. lapponica menzbieri*
 - eastern curlew, *N. madagascariensis*
- Endangered
 - southern right whale, *E. australis*
 - loggerhead turtle, *C. caretta*
 - leatherback turtle, *D. coriacea*
 - olive ridley turtle, *L. olivacea*

- lesser sand plover, *C. mongolus*
- red knot, *C. canutus*
- Australian painted snipe, *R. australis*
- Vulnerable
 - humpback whale, *M. novaeangliae*
 - grey-headed flying fox, *P. poliocephalus*
 - water mouse, *X. myoides*
 - green turtle, *C. mydas*
 - flatback turtle, *N. depressus*
 - greater sand plover, *C. leschenaultii*
 - bar-tailed godwit, *L. lapponica baueri*
 - white-throated needletail, *H. caudacutus*, and
 - wandering albatross, *D. exulans*.

These species are discussed in Section 3.8 above.

4.5 Listed Migratory Species

The results of the likelihood of occurrence assessment for migratory species identified as potentially occurring in the PMST are provided in Appendix B and summarised in Table 3.2. In summary, 39 listed migratory species under the EPBC Act, mostly migratory birds, are known or considered likely to occur within the study area, including:

- dugong, *D. dugon*
- humpback whale (as listed above)
- Australian humpback dolphin, *S. sahalensis*
- Australian snubfin dolphin, *O. heinsohni*
- loggerhead, leatherback, olive ridley, green and flatback turtles (as listed above)
- estuarine crocodile (*C. porosus*)
- greater sand plover, red knot, curlew sandpiper, great knot, eastern curlew, white-throated needletail and the wandering albatross (as listed above)
- common noddy, *A. stolidus*
- ruddy turnstone, *A. interpres*
- double-banded plover, *C. bicinctus*
- red-kneed dotterel, *C. veredus*
- sharp-tailed sandpiper, *C. acuminata*
- broad-billed sandpiper, *C. falcinellus*
- red-necked stint, *C. ruficollis*
- white-winged black tern, *C. leucopterus*
- Latham's snipe, *G. hardwickii*
- gull-billed tern, *G. nilotica*

- Caspian tern, *H. caspia*
- black-tailed godwit, *L. limosa*
- whimbrel, *N. phaeopus*
- Pacific golden plover, *P. fulva*
- grey plover, *P. squatarola*
- little tern, *S. albifrons*
- crested tern, *T. bergii*
- common greenshank, *T. nebularia*
- marsh sandpiper, *T. stagnatilis*
- fork-tailed swift, *A. pacificus*
- lesser frigatebird, *F. ariel*, and
- great frigatebird, *F. minor*.

These species are discussed in Section 3.8 above and in Appendix B.

4.6 Commonwealth Marine Area

The outer (seaward) portion of the Port limits are within the Commonwealth Marine Area (Figure 4.1). This includes a portion of the offshore dredged material placement area (Figure 1.2).

5 Matters of State Environmental Significance (MSES)

5.1 Protected Areas

The Barubbra Island Conservation Park is located at the mouth of the Burnett River on the northern bank, although it is separated from the main channel of the river by a seawall (Duke et al. 2019b) (Figure 5.1). This conservation park is characterised by estuarine wetlands (mangroves and saltmarsh).

The Mon Repos Conservation Park is located on the coast approximately 4 km south of the mouth of the Burnett River. The beach in this conservation park supports the largest concentration of nesting marine turtles on the eastern Australian mainland, and the most significant loggerhead turtle rookery in the South Pacific region.

The GSMP surrounds the PoB and extends seaward to the Commonwealth Marine Waters. However, the Port limits are excluded from the marine park. The waters adjacent to the Port limits are a General Use Zone of the marine park, with a Habitat Protection Zone along the Woongarra Coast, commencing at the edge of the Port limits at the Burnett River mouth (including the inshore waters at Mon Repos) (Figure 5.1).

There are no Fish Habitat Areas (FHAs) within the Port limits. The closest FHA is the Elliot River FHA, approximately 20 km south of the Burnett River mouth (Figure 5.1).

5.2 Threatened and Iconic Species and their Habitat

Many marine and terrestrial threatened or iconic species are known or considered likely to occur within the study area. However, shorebirds (Section 3.8.4) are arguably the most iconic and threatened species within the study area, relying on the extensive tidal wetlands surrounding the PoB. The habitat required by these species, both resident and migratory, is protected under the NCA (wildlife habitat) and regulated by the VMA (essential habitat). This habitat is also used by listed threatened species in Queensland such as the water mouse (Section 3.8).

Wildlife habitat is a MSES (DILGP 2017) and includes habitat of threatened and special least concern animals (i.e. platypus, echidna and migratory birds) under the NCA. Essential habitat is regulated vegetation under the VMA and includes regional ecosystems in which a threatened or special least concern species under the NCA has been known to, or is predicted to, occur. There are three areas of essential habitat mapped within the study area (Figure 5.2):

- PoB wetland area, which provides known habitat for shorebirds, and potentially the water mouse
- tidal wetlands on the western side of the river, from Barrubbra Island south to the PoB west property, which also provides habitat for shorebirds and potentially the water mouse, and
- vegetation on the PoB south property, which is modelled to provide habitat for endangered, vulnerable and special least concern wildlife and to provide core habitat for the wallum froglet (*Crinia tinnula*). However, the wallum froglet has not been recorded from the study area (as discussed below; also refer Appendix C).

No core koala bushland habitat or dugong protected areas are mapped within the study area or Port limits.

An essential habitat assessment of the PoB south property, including a field survey, was completed in 2009 to verify the suitability of this site as habitat for koala (*Phascolarctos*

cinereus) and wallum froglet (GHD 2009). The assessment concluded that the vegetation within the PoB south property has habitat characteristics suitable to support the wallum froglet and koala; however, these species were not detected on the site, the habitat was considered to be sub-optimal and these species are unlikely to occur (GHD 2009).

The coastal environment within Port limits provides some habitat for threatened marine species; however, the area is utilised in a more transient nature by migratory or mobile species. The coastal beaches along the Woongarra Coast are important nesting beaches for threatened marine turtles (Section 3.8.2), although the nesting beaches are south of the Port limits. The waters of the Port limits, particularly the deep navigation channel, are known to be used as inter-nesting habitat by loggerhead turtles (Section 3.8.2.1). Coastal dolphin species are known to inhabit the coastal waters and estuary within the study area, whereas migratory whales are more likely to frequent the offshore extent of the Port limits during winter and spring (Section 3.8.1).

5.3 Regulated Vegetation

Requirements of the VMA aim to regulate the clearing of vegetation for land use and development under the Queensland vegetation management framework. Regulated vegetation is a MSES (DILGP 2017). Regulated vegetation types present within the study area are discussed below (apart from regulated vegetation that is essential habitat, which is described in Section 5.2 above).

Remnant vegetation (Category B – of concern) is mapped within the study area, including the tidal wetlands of the western side of the river and the PoB wetland area (Figure 5.2). The majority of the mapped Category B areas are classified as least concern RE types; however, two endangered/of concern RE types are present (Figure 3.1):

- A small patch of RE 12.3.17, simple notophyll fringing forest, approximately 0.5 ha in size is mapped on the PoB west property. However, as discussed in Section 3.2.1.4, ground truthing during the May 2020 site inspection demonstrated that this patch does not exist; the area is cleared (non-remnant).
- RE 12.1.1, *C. glauca* woodlands, is mapped west of Barubbra Island and within a MSES high ecological significance (HES) wetland. This regional ecosystem is consistent with the coastal swamp oak forest TEC (Section 4.3). It is surrounded by RE types; 12.2.7 *M. quinquenervia* forest, and 12.1.3 (mangroves). This patch is not within GPC-owned land.

High-value regrowth vegetation (Category C) has been mapped on the PoB south property, bordering Rubyanna Road (Figure 5.2). As discussed in Section 3.2.1.3, the mapping of this regrowth vegetation does not appear to be accurate, based on the May 2020 site inspection.

Category R regulated vegetation – regrowth watercourse or drainage feature in a Great Barrier Reef (GBR) catchment, is mapped along the riparian edge of the Burnett River, the constructed channel surrounding the MRA and the area of mapped regrowth RE 12.3.17 on the PoB west property (Figure 5.2). As discussed in Section 3.2.1, the mapped REs in these areas are generally not accurate, based on the results of the May 2020 site inspection.

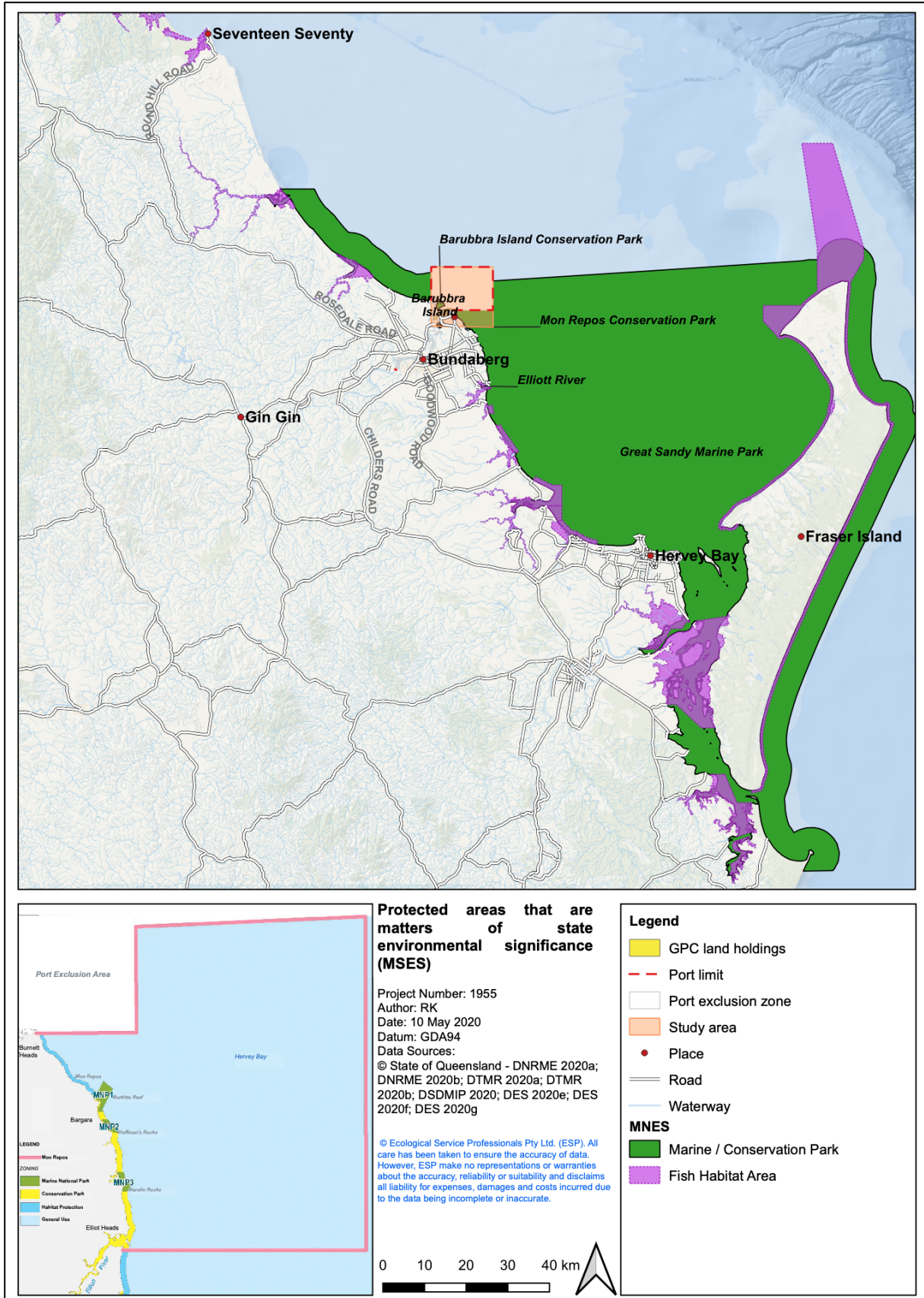


Figure 5.1 Protected areas that are MSES in the vicinity of the study area

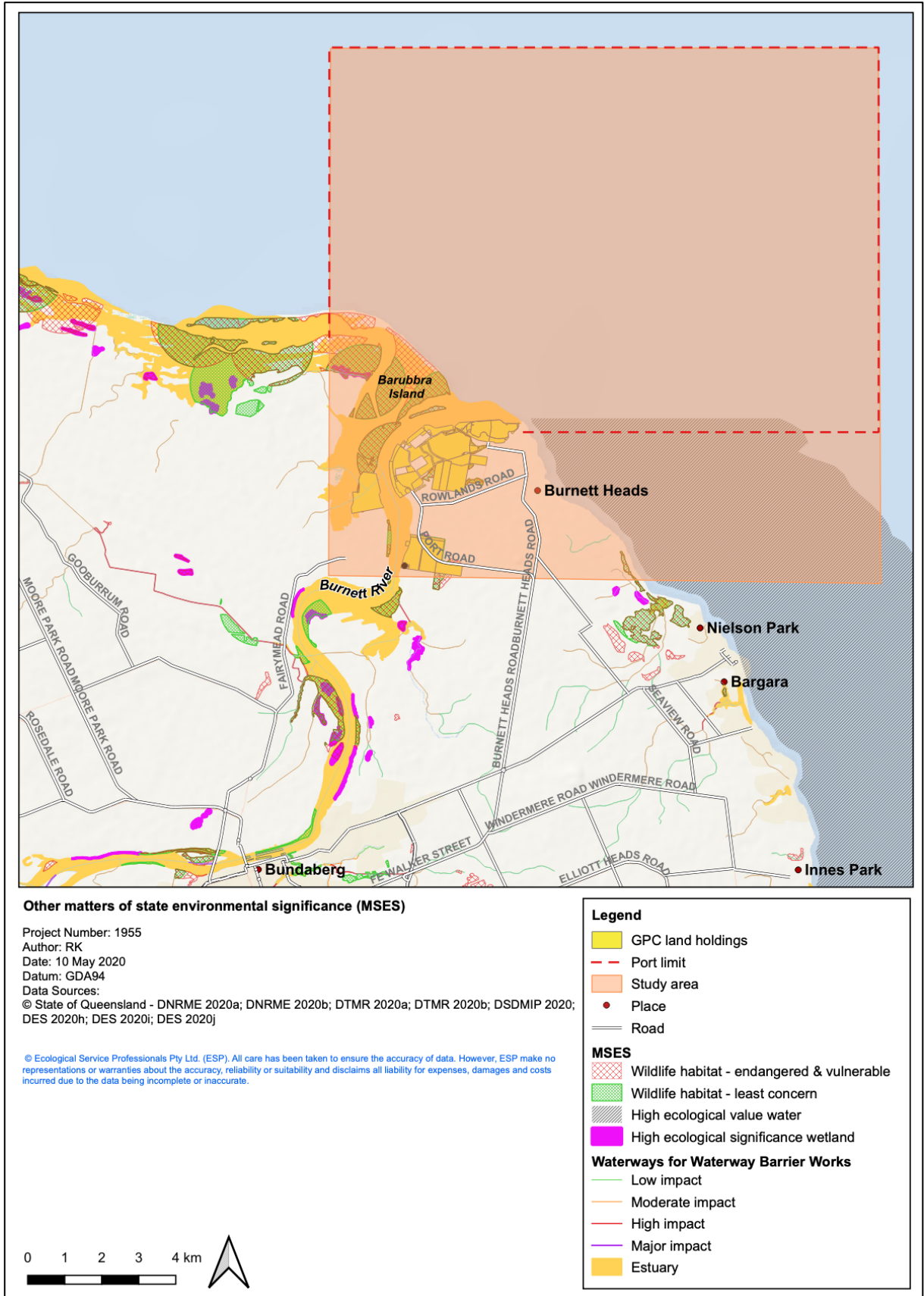


Figure 5.2 Wildlife habitat, HEV waters / wetlands and waterways providing for fish passage that are MSES in the vicinity of the study area

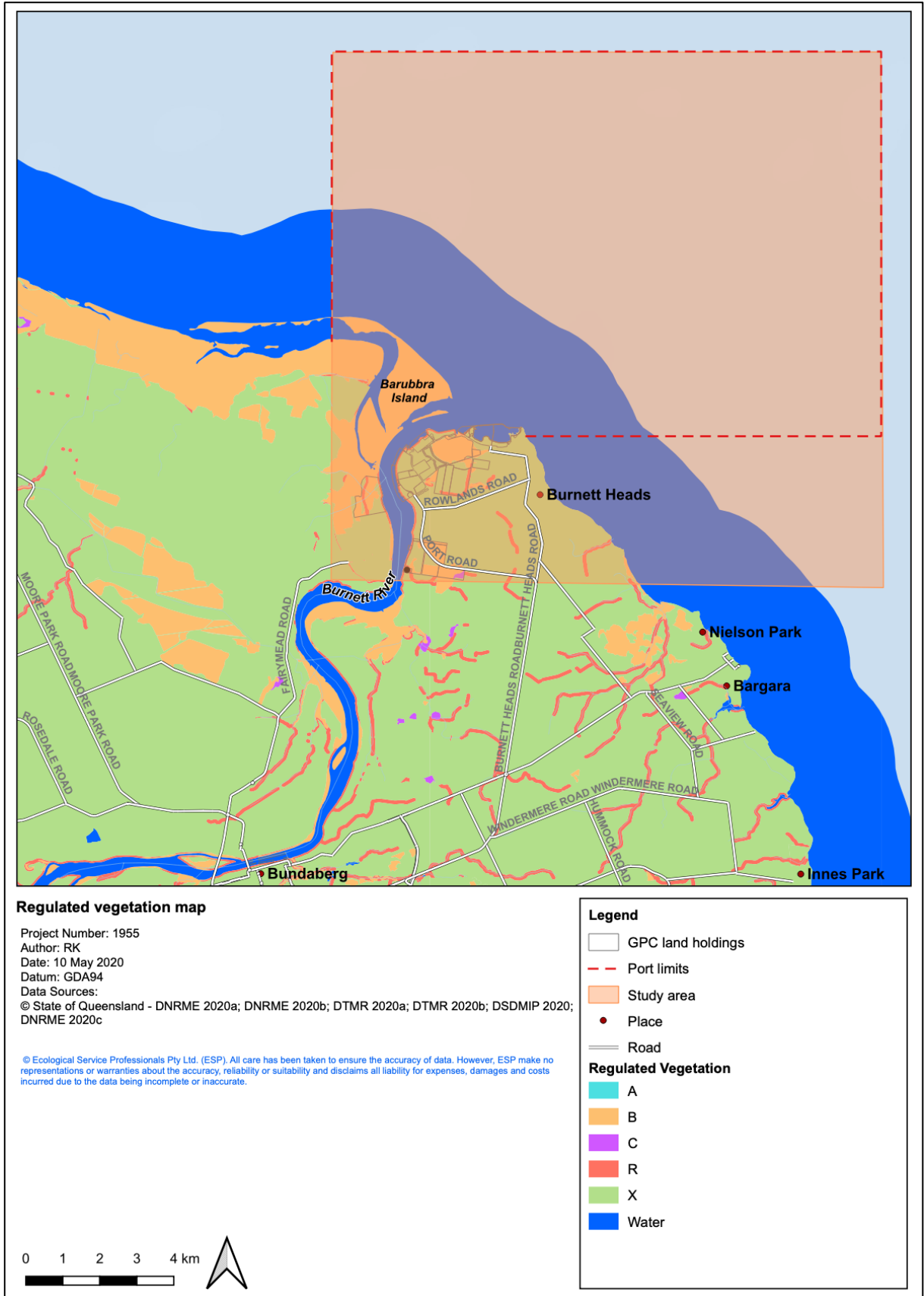


Figure 5.3 Regulated vegetation in the vicinity of the study area

5.4 High Ecological Value Wetlands and Waterways

The coastal waters extending south of the Burnett River mouth to Elliot Heads are identified as HEV waters under the EPP (Water and Wetland Biodiversity) (Area HB1, Hervey Bay) (Figure 5.2).

Two High Ecological Significance (HES) wetlands occur within the study area and are both listed as MSES wildlife habitat (Figure 5.2). One is located on the PoB south property, just north of the Bundaberg Sailing Club. This wetland consists of coastal/sub-coastal non-floodplain tree swamps (*Melaleuca* and *Eucalypt*), RE 12.2.11. Port Road intersects the mapped area.

The second is located on the west of Barubbra Island (Figure 5.2), which also contains MSES regulated vegetation (category B) and potentially a TEC under the EPBC Act (Section 4.3). This wetland is not hydrologically connected to the main river system due to a training wall (Duke et al. 2019b). This wetland is not within GPC-owned land.

5.5 Waterway Providing for Fish Passage

The Burnett River estuary and associated tidal wetlands are mapped as tidal waterways providing for fish passage under the *Waterways for Waterway Barrier Works* spatial layer (Figure 5.2). Waterways providing for fish passage are MSES where they are outside of an urban area (DILGP 2017). It is noted that the onshore MRA is included in the *Waterways for Waterway Barrier Works* spatial layer as a tidal waterway (Figure 5.2). However, this area does not provide fish habitat or provide for fish passage, as it is not tidally connected to Wallace Creek or the Burnett River, so is considered likely to be a mapping error.

5.6 Marine Plants

Marine plants grow on or adjacent to tidal land and include mangroves, seagrass, saltcouch, algae, samphire vegetation and adjacent plants, such as *Melaleuca* (paperbarks) and *Casuarina* (coastal she-oaks). Marine plants are MSES where they are outside of an urban area (DILGP 2017). Marine plants occur within the study area (Sections 3.3 & 3.4).

6 Matters of Local Environmental Significance (MLES)

6.1 Biodiversity

MLES under the planning scheme (BRC 2020a) generally reflect the identified MSES, including (Figure 6.1):

- Regulated vegetation, including regulated vegetation intersecting a watercourse (Section 5.3)
- MSES wildlife habitat (Section 5.2), and
- HES wetlands (Section 5.4).

Buffers to watercourses and wetlands are also mapped under the Planning Scheme.

6.2 Sea Turtle Sensitive Area

The Sea Turtle Sensitive Area (STSA) extends approximately 1.5–2 km inland from the coast, including throughout the study area (Figure 6.1). It was declared under Temporary Local Planning Instrument (TLPI) 1/2019 (BRC 2019) and applies to all assessable development within the STSA under the planning scheme. The purpose is to ensure development does not create harm to sea turtle nesting and activity by avoiding adverse impacts generated from artificial light.

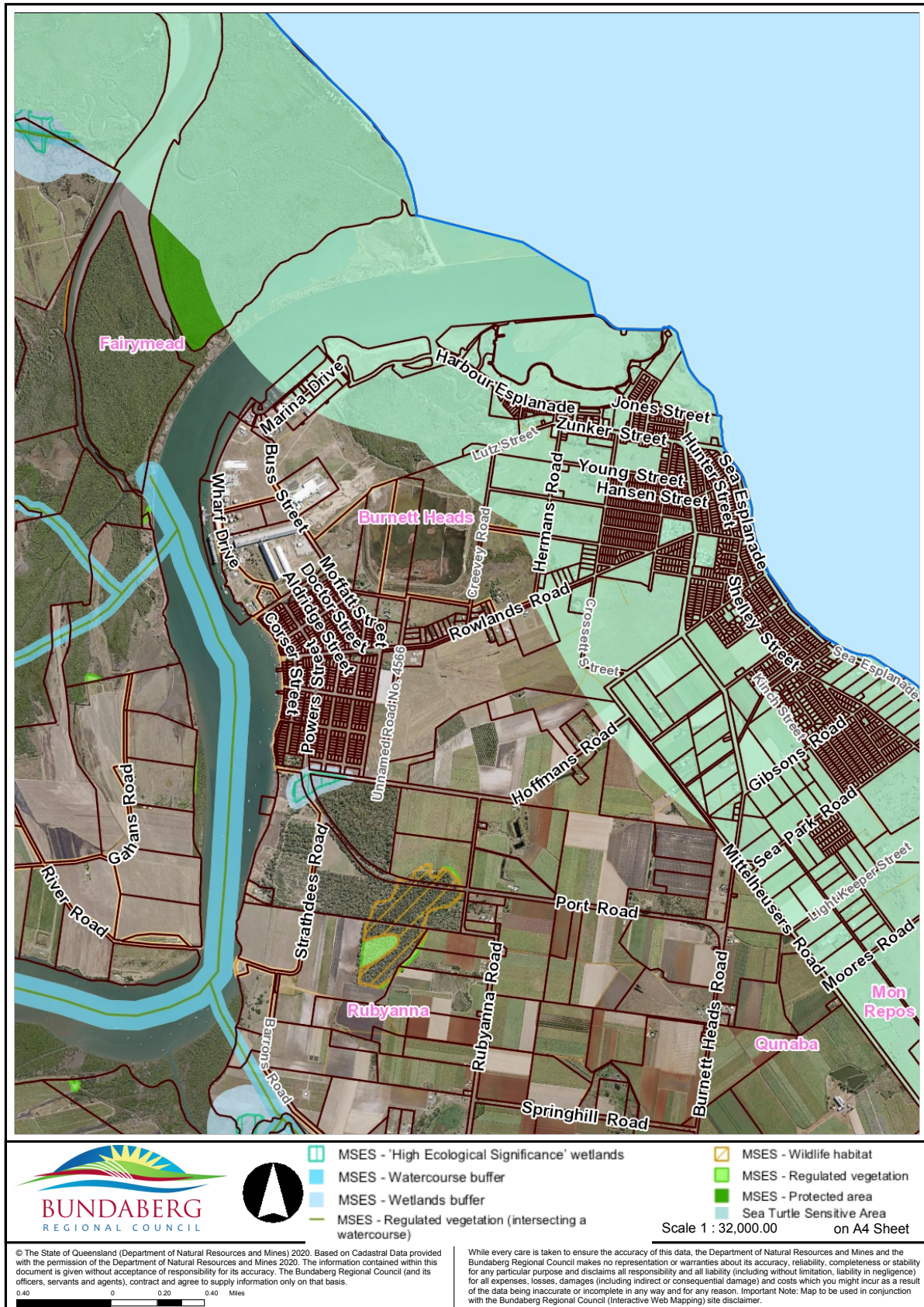


Figure 6.1 MLES within the study area (BRC 2020b)

7 Conclusions and Recommendations

7.1 Summary of Environmental Values

Table 7.1 Key local environmental attributes for the Port of Bundaberg

Key Local Attribute	Relevance to Port of Bundaberg
Tidal wetlands	The Burnett River estuary supports ~ 540 ha of tidal wetlands comprised of mangroves, saltpan / saltmarsh and fringing coastal she oak and paperbark communities (Duke et al. 2019b), including in the tidal areas of GPC-owned land. Tidal wetland floristic diversity in the Burnett River estuary is the lowest in the Burnett-Mary region, due to extensive modification and degradation of river water quality (Mackenzie & Duke 2011). However, tidal wetlands on GPC-owned land support a relatively high diversity of mangroves and saltmarsh species (Mackenzie & Duke 2011; FRC 2008; May 2020 site inspection). Many of the tidal wetlands in the study area are mapped as essential habitat (DES 2020h), due to the presence of threatened and migratory shorebirds.
Seagrass and macroalgae	Seagrass appears to be absent in the estuary, while ephemeral and sparse meadows of <i>Halophila ovalis</i> and <i>H. spinulosa</i> with some macroalgae have been previously recorded within the offshore dredged material placement area (Worley Parsons 2009b; AMA 2015). It is considered likely that seagrass (a sparse coverage of <i>Halophila</i> spp.) occurs within the wider Port limits when conditions are suitable. These species provide foraging habitat for listed threatened, migratory and marine species including the green turtle, dugong and seahorses; and also provide important habitat for species of fisheries significance.
Benthic fauna	Ongoing benthic monitoring demonstrates highly variable composition of benthic infauna composition within the offshore dredged material placement area, consistent with a high variability in sediment type (AMA 2015). Benthic infauna are important for a range of services including nutrient cycling, bioturbation and as a component of food webs, particularly as a food source for species of fisheries and conservation significance, including loggerhead turtles (DES 2018b). Coarser sediment types supported taxa such as crabs, whereas fine sediment was dominated by polychaete worms (AMA 2015).
Reef communities	Inshore coral reef habitat occurs along the Woongarra Coast, from Burnett Heads (just within the Port limits) to the Elliot River (DES 2018d). Reef communities in the area are a mix of tropical, subtropical and temperate species of hard and soft corals, with at least 46 species of hard coral known to occur in the GSMP (DES 2018a). Flooding from the Burnett and Mary rivers in 2011 and 2013 negatively impacted the surrounding coral reefs, reducing coral abundance by up to 60% on the Woongarra Coast, with an increase in the coverage of the stress tolerant coral <i>Turbinaria</i> and a decrease in <i>Acropora</i> coral communities (Butler et al. 2013; Coppo et al. 2014).
Fish and fisheries	The Port and surrounding areas provide a range of fish habitat (e.g. mangroves, mudflats, anthropogenic structures, bare soft sediment and potentially sparse seagrass). Commercial and recreational fishing occurs in the area, targeting small and large bodied fish (i.e. whiting, yellow-fin bream, flathead), prawns and mud crabs, which are valuable to the fisheries in the local area (DAF 2020; Lupton & Heidenreich 1999).
Marine mammals	There are relatively few published records of marine mammals in the area. Coastal dolphin species, including the Australian snubfin dolphin and the Australian humpback dolphin have been sighted or are considered likely to occur

Key Local Attribute	Relevance to Port of Bundaberg
	<p>within the Burnett River estuary and coastal environments (DES 2020b). Migratory whales, including the humpback whale, are likely to traverse further offshore through the broader Port limits during their seasonal migration (winter and spring). Dugong are likely to occur during seasonal peaks of seagrass growth, but are more likely to be seen south of the PoB in Hervey Bay (Sobtzick et al. 2017).</p>
Marine turtles	<p>Several marine turtle species have been recorded in the area. The Mon Repos Conservation Park is located approximately 4 km south of Burnett Heads. It is the most significant loggerhead turtle rookery in the southern hemisphere, with small numbers of flatback and green turtles also nesting here (DES 2018b; Limpus 2008). During the nesting season (November to January), marine turtles will occur in the coastal waters off Burnett Heads within the Port limits, and are known to use the dredged channel as inter-nesting habitat (DES 2020m). It is possible that green turtles may occur in the study area year-round, foraging on seagrass, macroalgae, mangrove propagules and other food sources (Sobtzick et al. 2017).</p>
Shorebirds	<p>Barubbra Island Conservation Park, the tidal wetlands on Port-owned land associated with Wallace Creek (PoB wetland area) and the PoB MRA are important foraging and roosting habitat areas for resident and migratory shorebirds (Worley Parsons 2012). Several threatened migratory birds are known to frequent the area.</p>
Terrestrial flora and fauna	<p>Several conservation significant flora and fauna species are known or highly likely to occur within the PoB and surrounds. The key species of conservation significance that potentially occur in the Port and surrounds (apart from shorebirds, which are described above) are the grey-headed flying fox, listed as vulnerable under the EPBC Act (DEHP 2016b); and the water mouse, listed as vulnerable under the EPBC Act and NCA (DAWE 2020).</p> <p>Two TECs listed under the EPBC Act occur within the study area (DAWE 2020). The subtropical/temperate coastal saltmarsh TEC, listed as vulnerable, occurs within the study area, including at the PoB wetlands, along the Burnett River frontage of the PoB south property and on the PoB west property. A small patch of coastal swamp oak forest TEC (endangered) is likely to occur inland of the river near Barubbra Island within the study area (but not on GPC-owned land).</p>
Marine water quality	<p>The water quality of the Burnett River estuary has been affected by altered hydrological flow, bank erosion and industrialisation (BMRG 2015). Coastal waters are likely to have good water quality at times, sufficient to support coral and seagrass growth (DES 2018d; AMA 2015, DERM 2010). There are HEV waters along the Woongarra Coast, immediately south of Burnett Heads (DERM 2010). WQOs under the Reef 2050 WQIP apply to the waters within the Port limits (State of Queensland 2018).</p>
Cultural and heritage values	<p>There are several local heritage places within the study area, listed under the planning scheme (BRC 2020a).</p> <p>The surrounding wetlands are of cultural significance to Indigenous Australians and are monitored by the Gidjarjil Development Corporation rangers. Two Aboriginal cultural sites are located on GPC-owned land (GPC 2017).</p>
Social values	<p>The Port is the gateway to the southern GBR, with many tourism operators operating from the marina, international visitors entering Australia through the Ports customs facilities and the social and leisure environment attracting locals and tourists to the marina. The Port's coastal environment is frequently used by recreational fishers, and turtle nesting and hatching season at Mon Repos attracts tourists to the region (DES 2018d).</p>

7.2 Recommendations

The site inspection in May 2020 found that the RE mapping is incorrect in a number of locations. Where development is proposed on GPC-owned land, a detailed vegetation survey is recommended to verify the vegetation communities (REs) on the site and to apply for a property map of assessable vegetation (PMAV). Detailed surveys would also be required to confirm the extent of the subtropical and temperate coastal saltmarsh TEC.

It is recommended that a benthic habitat survey of the entire Port limits, including areas around the mouth of the Burnett River, be incorporated into the next assessment of the offshore dredged material disposal area, which is planned for the second half of 2020. This will provide more information on the benthic habitat of the Port limits, including seagrass distribution. Ideally, the survey should be completed in spring (October or November), when seagrass beds are likely to be at their greatest extent.

Ongoing monitoring of the shorebirds in the GPC-owned land will continue to provide valuable information on the habitat use of these species, including for the MRA. Where possible, confirm scientific names for observed species (suggested scientific names correlating to the common names in the database have been provided in Appendix A) and use these for future monitoring events.

It is also recommended that consultation with the DAF is undertaken to remove the onshore spoil ground from the *Waterways for Waterway Barrier Works* spatial mapping layer.

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Appendix A Collated Shorebird Survey Results

Table 8.1 Collated shorebird count data for 15 monitoring events between April 2017 and September 2019 (Birdlife Bundaberg and BMRG data provided by GPC)

Common Name	Scientific Name*	EPBC Act Status	NCA Status	Location^			TOTAL ALL
				Main Pond	Estuarine Channel	Canadian Block	
Australian pied oystercatcher	<i>Haematopus longirostris</i>		LC	6	0	0	6
bar-tailed godwit	<i>Limosa lapponica baueri</i> **	V, M, O	V	298	0	0	298
black-fronted dotterel	<i>Elseyornis melanops</i>		LC	72	2	5	79
black-tailed godwit	<i>Limosa limosa</i>	M, O	SL	14	0	0	14
black-winged stilt	<i>Himantopus himantopus</i>	O	LC	1565	45	85	1695
broad-billed sandpiper	<i>Calidris falcinellus</i>	M, O	SL	7	0	0	7
bush stone curlew	<i>Burhunus grallarius</i>		LC	0	0	0	0
common greenshank	<i>Tringa nebularia</i>	M, O	SL	49	0	2	51
curlew sandpiper	<i>Calidris ferruginea</i>	CE, M, O	E	230	1	1	232
double-banded plover	<i>Charadrius bicinctus</i>	M, O	SL	5	0	0	5
eastern curlew	<i>Numenius madagascariensis</i>	CE, M, O	E	168	0	0	168
great knot	<i>Calidris tenuirostris</i>	CE, M, O	E	2	0	0	2
greater sand plover	<i>Charadrius leschenaultii</i>	V, M, O	V	0	0	0	0
grey plover	<i>Pluvialis squatarola</i>	M, O	SL	1	0	0	1
grey-tailed tattler	<i>Tringa brevipes</i>	M, O	SL	0	0	0	0
Latham's snipe	<i>Gallinago hardwickii</i>	M, O	SL	2	0	0	2
lesser sand plover	<i>Charadrius mongolus</i>	E, M, O	E	0	0	0	0
marsh sandpiper	<i>Tringa stagnatilis</i>	M, O	SL	39	2	2	43
masked lapwing	<i>Vanellus miles miles</i>		LC	64	7	13	84
Pacific golden plover	<i>Pluvialis fulva</i>	M, O	SL	23	0	1	24
red knot	<i>Calidris canutus</i>	E, M, O	E	1	0	0	1
red-capped plover	<i>Charadrius ruficapillus</i>	O	LC	289	2	0	291
red-kneed dotterel	<i>Charadrius veredus</i>	M, O	SL	79	0	1	80
red-necked avocet	<i>Recurvirostra novaehollandiae</i>	O	LC	26	0	0	26
red-necked stint	<i>Calidris ruficollis</i>	M, O	SL	432	5	0	437
ruddy turnstone	<i>Arenaria interpres</i>	M, O	SL	0	0	0	0
sharp-tailed sandpiper	<i>Calidris acuminata</i>	M, O	SL	1933	7	7	1947
sooty oystercatcher	<i>Haematopus fuliginosus</i>		LC	0	0	0	0
terek sandpiper	<i>Xenus cinereus</i>	M, O	SL	0	0	0	0

Common Name	Scientific Name*	EPBC Act Status	NCA Status	Location^			TOTAL ALL
				Main Pond	Estuarine Channel	Canadian Block	
whimbrel	<i>Numenius phaeopus</i>	M, O	SL	38	33	0	71
wood sandpiper	<i>Tringa glareola</i>	M, O	SL	0	0	0	0
common sandpiper	<i>Actitis hypoleucos</i>		SL	0	0	2	2
total waders				5343	104	119	5566
Caspian tern	<i>Hydroprogne caspia</i>	M, O	SL	156	0	0	156
common tern	<i>Sterna hirundo</i>	M, O	SL	0	0	0	0
crested tern	<i>Thalasseus bergii</i>	M, O	SL	28	1	0	29
gull-billed tern	<i>Gelochelidon nilotica</i>	M, O	SL	197	0	20	217
lesser crested tern	<i>Thalasseus bengalensis</i>	O	LC	0	0	0	0
little tern	<i>Sternula albifrons</i>	M, O	SL	76	0	0	76
whiskered tern	<i>Chlidonias hybrida</i>	O	C	891	0	0	891
white-winged black tern	<i>Chlidonias leucopterus</i>	M, O	SL	5	0	0	5
silver gull	<i>Chroicocephalus novaehollandiae</i>	O	LC	502	1	0	503
spotted tern	<i>Undetermined species***</i>			259	4	0	263
total terns				2114	6	20	2140
wader & tern totals				7457	110	139	7706
Australasian darter	<i>Anhinga novaehollandiae</i>		LC	5	0	2	7
Australasian gannet	<i>Morus serrator</i>		LC	1	0	0	1
Australasian grebe	<i>Tachybaptus novaehollandiae</i>		LC	16	0	0	16
Australasian shoveler	<i>Anas rhynchotis</i>		LC	0	0	0	0
Australian pelican	<i>Pelecanus conspicillatus</i>		LC	369	0	24	393
Australian white ibis	<i>Threskiornis moluccus</i>		LC	19	52	16	87
Australian wood duck	<i>Chenonetta jubata</i>		LC	10	28	4	42
black swan	<i>Cygnus atratus</i>		LC	169	0	0	169
black-necked stork	<i>Ephippiorhynchus asiaticus</i>		LC	2	1	1	4
black-shouldered kite	<i>Elanus axillaris</i>		LC	1	0	2	3
brahminy kite	<i>Haliastur indus</i>		LC	19	8	5	32
black kite	<i>Milvus migrans</i>		LC	12	2	3	17
brown falcon	<i>Falco berigora</i>		LC	0	1	0	1
buff-banded rail	<i>Gallirallus philippensis</i>		LC	1	0	0	1
cattle egret	<i>Bubulcus ibis</i>	O	LC	5	1	17	23
chestnut teal	<i>Anas castanea</i>		LC	2772	4	23	2799
collared sparrowhawk	<i>Accipiter cirrocephalus</i>		LC	1	0	0	1

Common Name	Scientific Name*	EPBC Act Status	NCA Status	Location^			TOTAL ALL
				Main Pond	Estuarine Channel	Canadian Block	
dusky moorhen	<i>Gallinula tenebrosa</i>		LC	0	0	2	2
eastern great egret	<i>Ardea alba modesta</i>		LC	14	7	8	29
eastern osprey	<i>Pandion haliaetus</i>	O	SL	2	4	0	6
Eurasian coot	<i>Fulica atra</i>		C	0	0	0	0
great cormorant	<i>Phalacrocorax carbo</i>		LC	2	0	0	2
grey teal	<i>Anas gracilis</i>		LC	1832	0	0	1832
hardhead	<i>Aythya australis</i>		LC	402	0	0	402
intermediate egret	<i>Ardea intermedia</i>		LC	15	1	9	25
little black cormorant	<i>Phalacrocorax sulcirostris</i>		LC	165	0	324	489
little egret	<i>Egretta garzetta</i>		LC	36	6	10	52
little pied cormorant	<i>Microcarbo melanoleucos</i>		LC	113	0	3	116
nankeen kestrel	<i>Falco cenchroides</i>		LC	5	2	11	18
nankeen night heron	<i>Nycticorax caledonicus</i>		C	0	0	0	0
Pacific black duck	<i>Anas superciliosa</i>		LC	203	0	47	250
peregrine falcon	<i>Falco peregrinus</i>		C	0	0	0	0
pied cormorant	<i>Phalacrocorax varius</i>		LC	5	0	7	12
pink-eared duck	<i>Malacorhynchus membranaceus</i>		LC	1	0	0	1
purple swamphen	<i>Porphyrio porphyrio</i>		LC	0	2	4	6
royal spoonbill	<i>Platalea regia</i>		LC	77	10	25	112
straw-necked ibis	<i>Threskiornis spinicollis</i>		LC	9	7	3	19
striated heron	<i>Butorides striata</i>		LC	1	1	1	3
swamp harrier	<i>Circus approximans</i>		LC	1	2	1	4
wandering whistling duck	<i>Dendrocygna arcuata</i>		LC	2	0	0	2
whistling kite	<i>Haliastur sphenurus</i>		LC	14	4	1	19
white-bellied sea-eagle	<i>Haliaeetus leucogaster</i>	O	LC	5	11	0	16
white-faced heron	<i>Egretta novaehollandiae</i>		LC	25	9	9	43
white-necked heron	<i>Ardea pacifica</i>		LC	0	5	2	7
brown goshawk	<i>Accipiter fasciatus</i>		LC	3	0	0	3
Australian hobby	<i>Falco longipennis</i>		LC	3	0	0	3
plumed whistling duck	<i>Dendrocygna eytoni</i>		LC	18	0	6	24
spotted harrier	<i>Circus assimilis</i>		LC	1	0	0	1
wedge-tailed eagle	<i>Aquila audax</i>		LC	1	0	0	1
Lewin's rail	<i>Lewinia pectoralis</i>		LC	0	0	0	0
Pacific baza	<i>Aviceda subcristata</i>		LC	0	0	0	0
black falcon	<i>Falco subniger</i>		LC	0	0	0	0

Common Name	Scientific Name*	EPBC Act Status	NCA Status	Location^			TOTAL ALL
				Main Pond	Estuarine Channel	Canadian Block	
glossy ibis	<i>Plegadis falcinellus</i>		SL	78	0	34	112
yellow-billed spoonbill	<i>Platalea flavipes</i>		LC	8	0	0	8
common myna	<i>Acridotheres tristis</i>		Y	8	1	1	10
magpie goose	<i>Anseranas semipalmata</i>		LC	51	0	0	51
spotless crane	<i>Porzana tabuensis</i>		LC	1	160	0	161
Australian hobby	<i>Falco longipennis</i>		LC	0	0	0	0
total – other				6503	329	605	7437
total – all				14,134	443	744	15,321

^ Locations as provided in the database. 'Port Plains' was also included in the database but there were no records from this location.

* Database included common names only, species names inserted by ESP

** Record is for common name only, we have assumed this sub-species

*** Uncertain of relevant species name

EPBC Act Status: CE: critically endangered; E: endangered; V: vulnerable; M: migratory; O: marine

NCA Status: E: endangered; V: vulnerable; LC: least concern, SL: special least concern, Y: introduced

Appendix B Likelihood of Occurrence of Threatened and Migratory Species

Table 8.2 Likelihood of occurrence in the study area for threatened and migratory species under the EPBC Act or threatened species under the NCA

Species	EPBC Act Status*	Qld NCA Status^	Habitat	Likelihood of occurrence within Study Area#
Birds				
<i>Botaurus poiciloptilus</i> Australasian bittern	E	E	Occurs in terrestrial freshwater wetlands where it favours tall, dense vegetation. It forages in shallow water, less than 30 cm deep at the edges of pools or waterways. Favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and/or reeds (DoEE 2020). Study area is within the likely distribution, but records in Australia are rare; no records from within the study area or nearby (Appendix C).	Unlikely
<i>Calidris canutus</i> red knot, knot	E, M, O	E	The red knot mainly inhabit 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. 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 (DoEE 2020). Known from the PoB (1 record from the onshore MRA since 2017; Appendix A and records from Burnett Heads, Appendix C).	Known
<i>Calidris ferruginea</i> curlew sandpiper	CE, M, O	E	Curlew sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. They forage on mudflats and nearby shallow water, at the edges of shallow pools and drains of intertidal mudflats and sandy shores. At high tide, they forage among low sparse emergent vegetation, such as saltmarsh, and sometimes forage in flooded paddocks or inundated saltflats. Occasionally they forage on wet mats of algae or waterweed, or on banks of beach-cast	Known

Species	EPBC Act Status*	Qld NCA Status^	Habitat	Likelihood of occurrence within Study Area#
			seagrass or seaweed (DoEE 2020). Known from the PoB (230 records from the onshore MRA since 2017) (Appendix A).	
<i>Calidris tenuirostris</i> great knot	CE, M, O	E	The species typically prefers sheltered coastal habitats, with large intertidal mudflats or sandflats. 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, saltlakes and non-tidal lagoons (DoEE 2020). Known from the PoB (two records from the onshore MRA since 2017; Appendix A and records from Burnett Heads, Appendix C).	Known
<i>Charadrius leschenaultii</i> greater sand plover, large sand plover	V, M, O	V	The species is almost entirely coastal, inhabiting littoral and estuarine habitats. They mainly occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine lagoons, and inshore reefs, rock platforms, small rocky islands or sand cays on coral reefs. They are occasionally recorded on near-coastal saltworks and saltlakes, including marginal saltmarsh, and on brackish swamps. They seldom occur at shallow freshwater wetlands (DoEE 2020). No records from the PoB onshore MRA (since 2017), but 15 records in the Wildlife Online database, ALA and Birdlife Database for the study area (Appendix C).	Known
<i>Charadrius mongolus</i> lesser sand plover, Mongolian plover	E, M, O	E	This species usually occurs in coastal littoral and estuarine environments. 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 salt pans, brackish swamps and sandy or silt islands in river beds. The species is seldom recorded away from the coast, at margins of lakes, soaks and swamps associated with artesian bores (DoEE 2020). No records from the PoB onshore MRA (since 2017), but 11 records in the Wildlife Online database and 59 records in the Birdlife database (Appendix C) for the study area.	Known
<i>Cyclopsitta diophthalma coxeni</i>	E	E	Coxen's fig-parrot remaining populations are now concentrated into fragmented remnants of dry rainforest and cool subtropical rainforest. Within these rainforest habitats, the fig-parrot is likely to favour alluvial areas that	Unlikely

Species	EPBC Act Status*	Qld NCA Status^	Habitat	Likelihood of occurrence within Study Area#
Coxen's fig parrot			support figs and other trees with fleshy fruits, in particular, habitats that have a high diversity of fig species, and that have a fruiting season that is staggered across moisture and altitudinal gradients. Most recent records of the fig-parrot have been 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. Coxen's fig-parrots have also been recorded at trees in gardens, cultivated farmlands, and along streets in country towns (DoEE 2020). Records from Moore Park to the north (ALA 2020), but not in the study area (Appendix C).	
<i>Erythrotriorchis radiatus</i> red goshawk	V	E	Occupies a range of habitats often at ecotones including coastal and sub-coastal tall open forest, tropical savannahs, woodlands and edge of rainforest and gallery forest along watercourses and wetlands that include melaleuca and casuarina species (DoEE 2020). No records from the study area or surrounds (Appendix C).	Unlikely
<i>Esacus magnirostris</i> beach stone curlew	O	V	Occupies coastlines from about Point Cloates in Western Australia, across northern and north-eastern Australia then south to northern New South Wales (OEH 2020). The beach stone curlew is a large, heavy-set wader that feeds on crabs and other marine invertebrates within the intertidal zone of beaches and estuaries (OEH 2020). No records from the PoB onshore MRA (since 2017), but one record in the Wildlife Online database and four records in the Birdlife database (Appendix C) for the study area.	Known
<i>Geophaps scripta scripta</i> squatter pigeon (southern)	V	V	The squatter pigeon (southern) occurs mainly in grassy woodlands and open forests that are dominated by eucalypts. It has also been recorded in sown grasslands with scattered remnant trees, disturbed habitats (i.e. around stockyards, along roads and railways, and around settlements), in scrub and wattle regrowth. The species is commonly observed in habitats that are located close to bodies of water (DoEE 2020). No records from the study area or surrounds (Appendix C).	Unlikely

Species	EPBC Act Status*	Qld NCA Status^	Habitat	Likelihood of occurrence within Study Area#
<i>Hirundapus caudacutus</i> white-throated needletail	V, M, O	V	White-throated needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. They occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, and also commonly occur over heathland. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks. In coastal areas, they are sometimes seen flying over sandy beaches or mudflats, and often around coastal cliffs and other areas with prominent updraughts, such as ridges and sand-dunes (DoEE 2020). Has been previously recorded in study area (ALA 2020, Birdlife 2020); however, it was likely to be a flyover only.	Known
<i>Limosa lapponica baueri</i> bar-tailed godwit (baueri or Western Alaskan)	V, M, O	V	This species are non-breeding visitors to the area and occupy the coastline of all Australian states. It is widespread in the Torres Strait and along the east and south east coast of Queensland. They forage near the edge of water or in shallow tidal estuaries, harbours, coastal lagoons, seagrass meadows and mudflats. They are mainly carnivorous feeding on worms, molluscs, crustaceans and insects (DoEE 2020). A total of 298 bar-tailed godwit have been recorded from the PoB onshore MRA since 2017 (Appendix A), however, the sub-species has not determined. This sub-species reported from the study area in the Wildlife Online database (Appendix C).	Known
<i>Limosa lapponica menzbieri</i> bar-tailed godwit (menzbieri)	CE, M, O	E	This sub-species is a non-breeding visitor to the area and forage on intertidal sandflats and mudflats and typically roost at high tide on sandy beaches, spits, islets and mudflats close to feeding grounds, usually in open areas (DoEE 2020). A total of 298 bar-tailed godwit have been recorded from the PoB onshore MRA since 2017 (Appendix A). However, the sub-species has not determined.	Likely
<i>Numenius madagascariensis</i> Eastern curlew	CE, M, O	E	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. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets (DoEE 2020). Known from the PoB (168 records from the onshore MRA since 2017) (Appendix A). There are 55 records from	Known

Species	EPBC Act Status*	Qld NCA Status^	Habitat	Likelihood of occurrence within Study Area#
			the study area in the Wildlife Online database and 276 in the birdata database (Appendix C).	
<i>Pachyptila turtur subantarctica</i> fairy prion (southern)	V, O	LC	The smallest species of prion, with the only known breeding habitat on Macquarie Island. The species has a circumpolar distribution, and probably frequents subtropical waters during the non-breeding season. The species burrows in hollows beneath cushions of <i>Colobanthus muscoides</i> (a perennial matting herb). No records from the study area (ALA 2020, Appendix C).	Unlikely
<i>Rostratula australis</i> Australian painted snipe	E, O	E	Inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum <i>Muehlenbeckia</i> or canegrass or sometimes tea-tree (<i>Melaleuca</i>). Snipe breeding habitat requirements may be quite specific, e.g. shallow wetlands with areas of bare wet mud and both upper and canopy cover nearby (DoEE 2020). Study area is within the likely habitat for this species. No records from the PoB onshore MRA (Appendix A), ALA (2020) or the Wildlife Online database (Appendix C), but one record for the study area in the birdata database (Appendix C).	Likely
<i>Turnix melanogaster</i> black-breasted button quail	V	V	The black-breasted button-quail prefers drier low closed forests, particularly semi-evergreen vine thicket, low microphyll vine forest, <i>Araucarian microphyll</i> vine forest and <i>Araucarian notophyll</i> vine forest. They may also be found in low, dense acacia thickets and, in littoral area, in vegetation behind sand dunes. A crucial foraging requirement of this species is deep leaf litter (DoEE 2020). Known records from Moore Park to the north of the study area, but study area is not likely to have appropriate habitat for this species.	Possible
<i>Apus pacificus</i> fork-tailed swift	M, O	SL	This species occurs over inland plains, coastal areas, cliffs, islands, out to sea and urbanised areas. They mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh and found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. They sometimes occur above rainforests, wet sclerophyll forest or open forest or plantations of pines (DoEE	Known

Species	EPBC Act Status*	Qld NCA Status^	Habitat	Likelihood of occurrence within Study Area#
			2020). Recent records in study area on ALA (2020) and the Birddata database (Appendix C), however these were likely to be flyovers only.	
<i>Ardenna carneipes</i> flesh-footed shearwater	M, O	SL	The flesh-footed shearwater mainly occurs in the subtropics over continental shelves and slopes and occasionally inshore waters. Individuals also pass through the tropics and over deeper waters when on migration. Pairs breed on islands in burrows on sloping ground in coastal forest, scrubland, shrubland or grassland (DoEE 2020). Historical records from the 1970s within the study area (ALA 2020), but no current records (Appendix C) and study area does not provide key habitat.	Unlikely
<i>Sternula albifrons</i> little tern	M, O	SL	Little terns inhabit sheltered coastal environments, including lagoons, estuaries, river mouths and deltas, lakes, bays, harbours and inlets, especially those with exposed sandbanks or sand-pits, and also on exposed ocean beaches. They forage in the shallow waters of estuaries, coastal lagoons and lakes, along open coasts, especially around bars off the entrances to rivers and lagoons, less often at sea, and usually 50 m of shore. Breeding colonies prefer sheltered sand-spits that are surrounded by narrow shallow channels within lakes. The species is associated with a number of Ramsar sites (DoEE, 2020). Known from the PoB (76 records from the onshore MRA since 2017) (Appendix A) and the wider study area (Appendix C).	Known
<i>Anous stolidus</i> common noddy	M, O	SL	During the breeding season, the common noddy usually occurs on or near islands, on rocky islets and stacks with precipitous cliffs, or on shoals or cays of coral or sand. When not at the nest, individuals will remain close to the nest, foraging in the surrounding waters. Birds may nest in bushes, saltbush, or other low vegetation. They may also nest on the ground in pigface (<i>Carpobrotus</i> spp.) or grass, on bare rock, on top of rocks protruding above vegetation, on shingle beaches, among coral rubble or in sand close to grassy areas. The species has also been recorded nesting in the forks of tall trees, at the top of coconut palms (<i>Cocos nucifera</i>), in holes in dead timber and on tree-stumps (DoEE 2020).	Known
<i>Fregata ariel</i> lesser frigatebird	M, O	SL	The lesser frigate bird occurs over tropical and subtropical waters across the Indian and Pacific Ocean, breeding on remote islands. These birds are most likely to be seen from the mainland prior to the onset of a tropical cyclone,	Known

Species	EPBC Act Status*	Qld NCA Status^	Habitat	Likelihood of occurrence within Study Area#
			and once this abates, they disappear again (ALA 2020). Records in study area (ALA 2020), although these are likely to be of flyovers only.	
<i>Fregata minor</i> great frigatebird	M, O	SL	Great frigatebirds have large nesting populations in the tropical Pacific, feeding in pelagic waters often within 80 km of their breeding colony or roosting area. These birds often take migrations across their range and there are recent records in study area, although these are likely to be of flyovers only (ALA 2020).	Known
<i>Diomedea exulans</i> wandering albatross	V, M, O	V	These birds are marine, pelagic and aerial, occurring where ocean temperatures range from -2° to 24°C. In the Australasian region, it occurs inshore, offshore and in pelagic waters. The wandering albatross nests on coastal or inland ridges, slopes, plateaux and plains, often on marshy ground. They prefer open or patchy vegetation, requiring areas that are near exposed ridges or hillocks so that it can take off. Records in study area (ALA 2020) are likely to be of flyovers only.	Known
<i>Fregatta grallaria grallaria</i> white-bellied storm petrel	V, O	LC	These species are oceanic birds that spend the majority of their life cycle at sea or on offshore islands (DoEE 2020). They are likely to occur in the seas offshore of the coast, but unlikely to occur in the study area except as very occasional windblown vagrants. No records in study area in Wildlife Online search (Appendix D).	Unlikely
<i>Macronectes giganteus</i> southern giant-petrel	E, M, O	E		
<i>Phoebetria fusca</i> sooty albatross	V, M, O	V		
<i>Pterodroma neglecta neglecta</i> kermadec petrel (western)	V, O	LC		
<i>Thalassarche cauta cauta</i> shy albatross	V, M, O	V		
<i>Thalassarche cauta steadi</i>	V, M, O	V		

Species	EPBC Act Status*	Qld NCA Status^	Habitat	Likelihood of occurrence within Study Area#
white-capped albatross				
<i>Thalassarche eremita</i>	E, M, O	SL		
Chatham albatross				
<i>Thalassarche impavida</i>	V, M, O	SL		
Campbell albatross				
<i>Thalassarche melanophris</i>	V, M, O	SL		
black-browed albatross				
<i>Thalassarche salvini</i>	V, M, O	SL		
Salvin's albatross				
Marine Reptiles				
<i>Caretta caretta</i> loggerhead turtle	E, M, O	E	Occurs in coral and rocky reefs, seagrass beds and muddy bays throughout eastern, northern and western Australia. Forage for benthic invertebrates in shallow nearshore coastal waters. Nesting occurs along the Queensland mainland coast, but the main nesting locations are well known – Mon Repos and Wreck Rock beaches on the mainland (approximately 4 km south of the PoB); Islands in the Capricorn Bunker Group; and cays in the Swain Reefs. Peripheral sites that have been identified as sites of interest with changing climate are Caloundra Beaches on the Sunshine Coast and the islands offshore of Moreton Bay (Moreton and North and South Stradbroke) (DoEE 2020). Mon Repos is the largest loggerhead turtle rookery in the southern hemisphere, and the species frequently inhabits the coastal waters surrounding PoB (DES 2018b).	Known
<i>Crocodylus porosus</i> salt-water crocodile, estuarine crocodile	M, O	V	Salt-water crocodiles mostly occur in tidal rivers, coastal floodplains and channels, billabongs and swamps up to 150 km inland from the coast. This species usually inhabits the lower (estuarine) reaches of rivers. In Queensland, the species is usually restricted to coastal waterways and floodplain wetlands. Infrequent observations have been recorded in the	Likely

Species	EPBC Act Status*	Qld NCA Status^	Habitat	Likelihood of occurrence within Study Area#
			Burnett River and broader Burnett Mary region but at the southern extent of their range.	
<i>Chelonia mydas</i> green turtle	V, M, O	V	Mainly occurs in tropical and subtropical waters throughout northern Australia. Prefers shallow benthic foraging habitats such as rocky and coral reefs and inshore seagrass beds. Nests on sandy beaches. A small number of females nest at Mon Repos (approximately 4 km south of the PoB) each year. Hervey Bay (approximately 75 km south east of the PoB), and the islands of Capricorn and Bunker group in the GBR (>100 km north) is considered to be a key foraging and juvenile habitat area (DoEE 2020).	Known
<i>Dermochelys coriacea</i> leatherback turtle	E, M, O	E	Occurs in tropical, subtropical and temperate waters throughout Australia. Highly pelagic species that rarely enters coastal waters except to breed. No large rookeries have been recorded in Australia (DoEE 2020). Historical records from the study area (DES 2020b).	Possible
<i>Elseya albagula</i> white-throated snapping turtle	CE	E	The white-throated snapping turtle is a freshwater turtle only found in the Burnett, Fitzroy, Raglan and Mary river drainages of south-east Queensland. It prefers permanent flowing water habitats where there are suitable shelters and refuges (e.g. fallen trees) (DoEE 2020). No suitable habitat in the study area.	Unlikely
<i>Eretmochelys imbricata</i> hawksbill turtle	V, M, O	E	Occurs in tropical, subtropical and temperate waters across Australia. Forage in coral and rocky reef habitat, and are found less frequently in seagrass habitats (DoEE 2020). Infrequently observed within the inshore coastal environment of Bundaberg.	Likely
<i>Lepidochelys olivacea</i> olive ridley turtle	E, M, O	E	Forage in shallow benthic habitats, but not typically in coral reef or seagrass habitat. No concentrated nesting areas for this species have been found in Australia, although low-density nesting occurs in far northern Australia (DoEE 2020). Known records from the region, including a historical record from Mon Repos and a more recent record from Fraser Island (ALA 2020; DES 2020b).	Likely
<i>Natator depressus</i> flatback turtle	V, M, O	V	Typically occurs in tropical waters of northern Australia. Forage in soft sediment habitats in shallow inshore waters. Nesting occurs in region at Curtis Island, Peak Island and Wild Duck Island, all located >175 km north of PoB.	Known

Species	EPBC Act Status*	Qld NCA Status^	Habitat	Likelihood of occurrence within Study Area#
			Adults forage in shallow, soft-bottom habitat for benthic invertebrates (DoEE 2020). Low-density nesting is known to occur in Mon Repos, 4 km south of PoB.	
Reptiles				
<i>Delma torquata</i> adorned delma, collared delma	V	V	This species has been recorded in a number of different soil types and land zone. Relevant to the study area is land zone 3; alluvial river and creek flats. The microhabitat tends to include rocks, logs, bark and other coarse woody debris and mats of leaf litter. The typical mid-story vegetation in areas of known species populations consists of red ash (<i>Alphitonia excelsa</i>), wattles (<i>A. fimbriata</i> , <i>A. concurrens</i>), brush box (<i>Lophostemon confertus</i>), hovea (<i>Hovea longifolia</i>) and lantana (<i>L. camara</i>). The ground cover is predominantly native grasses such as kangaroo grass (<i>Themeda triandra</i>), barbed-wire grass (<i>Cymbopogon refractus</i>), wiregrass (<i>Aristida</i> sp.) and lomandra (<i>Lomandra</i> sp.) (DoEE 2020).	Unlikely
<i>Egernia rugosa</i> yakka skink	V	V	Occurs in open dry sclerophyll forest, woodland and scrub within the Mulga Lands and Brigalow Belt South Bioregion. Common woodland types include: <i>A. harpophylla</i> , <i>A. aneura</i> , <i>A. catenulata</i> , <i>A. shirleyi</i> , <i>C. cristata</i> , <i>E. populnea</i> , <i>Eucalyptus</i> spp., <i>Callitris glaucophylla</i> . Microhabitat requirements include areas for the species to shelter including partly buried rocks, logs or tree stumps, root cavities, abandoned animal burrows and sometimes dense ground cover. In cleared habitat, this species can persist where there are shelter sites such as raked log piles, deep gullies, tunnel erosion/sinkholes and rabbit warrens. The species has also been found sheltering under sheds and loading ramps (DoEE 2020).	Unlikely
<i>Furina dunmalli</i> Dunmall's snake	V	V	Preferred habitat is Brigalow forest and woodland with fallen timber and ground litter, growing on cracking clay soils and clay loam soils. Also occurs in <i>Eucalyptus</i> and <i>Callitris</i> woodland with fallen timber and ground litter (DoEE 2020). Unlikely to be suitable habitat in the study area.	Unlikely

Species	EPBC Act Status*	Qld NCA Status^	Habitat	Likelihood of occurrence within Study Area#
Marine Mammals				
<i>Balaenoptera musculus</i> blue whale	E, M, O, C	LC	Blue whale sightings in Australian waters are widespread, and it is likely that the whales occur around the continent at various times of the year. However, much of the Australian continental shelf and coastal waters have no particular significance to the whales and are used only for migration and opportunistic feeding (DoEE 2020). No recent records from the Burnett-Mary region (ALA 2020).	Unlikely
<i>Eubalaena australis</i> southern right whale	E, M, O, C	LC	This species prefers near-shore, shallow-water depths while breeding and calving. The feeding and migratory habitat parameters are poorly known (DoEE 2020). Recent observations have been recorded in Hervey Bay, approximately 75 km south east of PoB (Coppo et al. 2014), although sightings are rare.	Possible
<i>Megaptera novaeangliae</i> humpback whale	V, M, O, C	V	Migrate close to the coast in Queensland from Antarctic feeding grounds to breeding and calving grounds in the Great Barrier Reef. Hervey Bay (located approximately 75 km south east of PoB) is a popular resting place for migrating humpback whales, with approximately 30% of east coast migrating individuals stopping here. The migratory habitat for the humpback whale is coastal waters less than 200 m in depth and within 20 km of the coast. Migration typically begins in southern Australia during May and southern migration begins in October (DoEE 2020).	Known
<i>Balaenoptera edeni</i> Bryde's whale	M, O, C	LC	Occur in oceanic and coastal temperate to tropical waters. Paucity of confirmed records in Australia (2020b)– known from Queensland from one stranding (DoEE 2020).	Unlikely
<i>Orcaella heinsohni</i> Australian snubfin dolphin	M, O, C	V	Australian snubfin dolphins have been recorded almost exclusively in coastal and estuarine waters. They predominately feed in coastal estuarine waters. It is doubtful that they venture very far upstream in river systems, although occasional vagrants may venture upstream. This species is typically found in shallow waters less than 20 m deep, close to the coast, close to river and creek mouths and in the proximity of seagrass beds (DoEE 2020). The	Likely

Species	EPBC Act Status*	Qld NCA Status^	Habitat	Likelihood of occurrence within Study Area#
			species has been recorded upstream of the Burnett River and a stranding off Moore Park Beach (DES 2020b).	
<i>Orcinus orca</i> killer whale, orca	M, O, C	LC	Typically found in cold southern waters but migrate into Queensland waters during winter (DoEE 2020). They have been observed in coastal waters south of Hervey Bay, approximately 75 km south east of the PoB.	Unlikely
<i>Sousa sahalensis</i> Australian humpback dolphin^^	M, O, C	V	This species typically show selection for various types of habitats including dredged channels, reefs, seagrass flats and mangroves. They inhabit coastal waters of northern Australia, primarily found within 20 km of the coast. Key localities in Queensland include, Moreton Bay (250 km south), the Great Sandy Straits (80 km south east), Port Curtis and Port Alma (>250 km north). Known from the region and study area provides suitable habitat.	Likely
<i>Dugong dugon</i> dugong	M, O	V	Major concentrations of dugongs along the Queensland coast occur in wide, shallow, protected bays and mangrove channels, and in the inside edge of large inshore islands. These areas coincide with significant seagrass beds. They also use deep-water habitats. Large numbers have been sighted in water more than 10 m deep in several areas including the Torres Strait, the northern Great Barrier Reef region, and Hervey Bay in southeast Queensland (DoEE 2020). There are known records from near the study area, including a stranding in the Burnett River in 2013 (DEHP 2016a), and they are predicted to occur in low to moderate density in the coastal waters offshore of the PoB (Sobtzick et al. 2017).	Likely
Other Mammals				
<i>Chalinolobus dwyeri</i> large-eared pied bat	V	V	Found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the fairy martin. Frequents low to mid-elevation dry open forest and woodland close to these features. Found in well-timbered areas containing gullies (DoEE 2020). Study area does not provide suitable habitat.	Unlikely

Species	EPBC Act Status*	Qld NCA Status^	Habitat	Likelihood of occurrence within Study Area#
<i>Dasyurus hallucatus</i> northern quoll	E	LC	The northern quoll occupies a diversity of habitats across its range which includes rocky areas, eucalypt forest and woodlands, rainforests, sandy lowlands and beaches, shrubland, grasslands and desert. Northern quoll habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal. Rocky habitats are usually of high relief, often rugged and dissected but can also include fields or caves in low lying area. Eucalypt forest or woodland habitats usually have a high structural diversity containing large diameter trees, termite mounds or hollow logs for denning purposes. Dens are made in rock crevices, tree holes or occasionally termite mounds. Northern quolls sometimes occur around human dwellings and campgrounds. Northern quolls appear to be most abundant in habitats within 150 km of the coast (DoEE 2020). Closest record is from Maryborough, approximately 90 km south of the study area.	Unlikely
<i>Nyctophilus corbeni</i> Corben's long-eared bat	V	V	In Queensland and New South Wales this bat inhabits a variety of vegetation types, but it is distinctly more common in box / ironbark / cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of New South Wales and southern Queensland (DoEE 2020). No records in the region (ALA 2020).	Unlikely
<i>Petauroides volans</i> greater glider	V	V	The greater glider is primarily folivorous, with a diet mostly comprising eucalypt leaves, and occasionally flowers. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. The greater glider favours forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species. During the day it shelters in tree hollows, with a particular selection for large hollows in large, old trees (DoEE 2020). There is a record from Bundaberg, but not in the study area (ALA 2020) and the study area does not provide key habitat for this species.	Unlikely
<i>Phascolarctos cinereus</i> koala (combined populations of QLD, NSW and the ACT)	V	V	Common throughout the broad band of forests and woodlands dominated by <i>Eucalyptus</i> spp. extending from north Queensland to the south-eastern corner of mainland South Australia. Occupy forests and woodlands where there are acceptable food trees (<i>Eucalyptus</i> spp., <i>Corymbia</i> spp., etc.). Distribution is affected by altitude, temperature and leaf moisture (DoEE 2020). There is a	Possible

Species	EPBC Act Status*	Qld NCA Status^	Habitat	Likelihood of occurrence within Study Area#
			known record from Bundaberg (ALA 2020), and mapped suitable habitat occurs in the study area, although a previous survey did not detect koalas and the habitat was considered to be sub-optimal (GHD 2009).	
<i>Pteropus poliocephalus</i> grey-headed flying-fox	V	LC	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy (DoEE 2020). There is a flying fox camp (roosting colony) located within the mangrove forests on Flying Fox Island in the Burnett River, upstream of the study area, and camps are also known from Bargara to the south of the PoB and Moore Park to the north (DEHP 2016b).	Likely
<i>Xeromys myoides</i> water mouse	V	V	Habitat required by the water mouse includes mangroves and the associated saltmarsh, sedgeland, clay pans, heathlands and freshwater wetlands. They nest in tunnels dug into banks or build mud mound nests made of peat, mud and sand. The nests are on the edge of the forest above the high tide mark and next to the mangroves and saltmarsh (DoEE 2020). Known to occur in the Burnett-Mary region, but no records from Bundaberg. Suitable habitat within the study area.	Possible – Likely
Elasmobranchs				
<i>Carcharias taurus</i> (east coast population) grey nurse shark (east coast population)	CE, O	E	Grey nurse sharks are found primarily in warm temperate (from subtropical to cool temperate) inshore waters around rocky reefs and islands, in or near deep sandy-bottomed gutters or rocky caves, and occasionally in the surf zone and shallow bays. They are often observed hovering motionless just above the seabed. They have been recorded at varying depths down to 230 m on the continental shelf, but are most commonly found between 15–40 m. (DoEE 2020). The nearest records are within Tin Can Bay south of Fraser Island (approx. 125 km south east of PoB) (DES 2020b) and on the eastern side of Fraser Island (Otway and Ellis 2011).	Unlikely
<i>Carcharodon carcharias</i> great white shark	V, M, O	–	Occurs in subtropical and temperate waters (including coastal waters, surf zones and embayments) from central QLD along the southern coastline to the North West Cape in WA (DoEE 2020). Moves seasonally along the	Possible

Species	EPBC Act Status*	Qld NCA Status^	Habitat	Likelihood of occurrence within Study Area#
			Queensland coast, but is more typically found in temperate waters. One record exists off the Bundaberg coast by a setline catch, QLD Museum specimen.	
<i>Pristis zijsron</i> green sawfish	V, M, O	–	Green sawfish are currently distributed from about the Whitsundays in Queensland across northern Australian waters to Shark Bay in Western Australia. It generally occurs in inshore marine waters, estuaries, river mouths, embankments and along sandy and muddy beaches. There are also records of green sawfish hundreds of kilometres offshore in relatively deep water (DoEE 2020). There are no known records from the Burnett-Mary region (DES 2020a).	Unlikely
<i>Lamna nasus</i> porbeagle, mackerel shark	M, O	–	Occurs in oceanic waters, typically around the Continental Shelf. Only occasionally enters coastal waters temporarily. In Australia, the species occurs in waters from southern Queensland to south-west Australia (DoEE 2020). No records in the vicinity of the PoB.	Unlikely
<i>Manta alfredi</i> reef manta ray	M, O	–	Occurs along the eastern coast of Australia (Couturier et al. 2011). Inshore species that typically occurs on the continental shelf, tropical and subtropical rocky and coral reefs, islands, and coastlines. This species has been observed approximately 80 km offshore from the PoB around Lady Elliot Island.	Unlikely
<i>Manta birostris</i> giant manta ray	M, O	–	Occurs from south-western WA around the tropical north and south to the southern coast of NSW. Considered an oceanic species typically found offshore (Couturier et al. 2011).	Unlikely
<i>Rhincodon typus</i> whale shark	V, M	–	Coastal and oceanic species that occurs in tropical and warm temperate waters off NT, QLD, and northern WA, though isolated records exist off NSW, VIC and SA (DoEE 2020). Aggregations of whale sharks occur in Western Australian waters, none are known from Queensland coastal waters (DoEE 2020). Individuals have been sighted off Fraser Island and Moreton Bay, but sightings are very rare.	Unlikely

Species	EPBC Act Status*	Qld NCA Status^	Habitat	Likelihood of occurrence within Study Area#
Plants				
<i>Acacia attenuata</i>	V	V	This species occurs on flat coastal lowland plains, at altitudes of lower than 30 m above sea level. Typically occurs in seasonally waterlogged areas of wet heathland or heathland margins, open forest and woodland communities, and specifically on sandy poorly drained soils or peat swamps which are infertile (DoEE 2020). As a pioneer species and heliotype (adapted to high light environments), abundances are usually greater in areas of high light intensities such as along forest margins and in open heathland plains (DoEE 2020). Some records from Moore Park, north of the study area (ALA 2020). <i>Acacia</i> spp. was recorded on sand ridges within the mangrove forests associated with Wallace Creek (PoB wetlands) by FRC (2008); however, species not determined.	Possible
<i>Cupaniopsis shirleyana</i> wedge-leaf tuckeroo	V	V	The wedge-leaf tuckeroo occurs in a variety of dry rainforest vegetation types, including vine thicket communities on hillsides, stream beds and along riverbanks. This species is also likely to occur on the margins of native vegetation in scrubby urbanised areas. It is predominately found on dark brown sandy loams and sandy clay loams. Sites where the species has been found are mostly simple microphyll closed forests to tall closed forest, often with Hoop Pine (<i>Araucaria cunninghamii</i>) emergent (DoEE 2020). Known from Bundaberg region. Was not recorded during a survey of the PoB south property (GHD 2008). However, a different species of tuckeroo (<i>C. anacardioides</i>) was recorded on sand ridges within the mangrove forests associated with Wallace Creek (PoB wetlands) by FRC (2008).	Possible
<i>Cycas megacarpa</i>	E	E	<i>C. megacarpa</i> occurs in spotted gum (<i>E. maculata</i>) and narrow-leaved ironbark (<i>E. crebra</i>) woodland and open forest with a grassy understorey. It has also been recorded on rainforest margins. The species usually grows on hill tops and steep slopes. It is found on varying topsoils; commonly sandy loams or shallow clay loams which are often stony (DoEE 2020). No records from the study area or surrounds.	Unlikely
<i>Cycas ophiolitica</i>	E	E	Grows on hills and slopes in sparse, grassy open forest at altitude ranges from 80-400m above sea level. Associated species include <i>C. dallachiana</i> , <i>C.</i>	Unlikely

Species	EPBC Act Status*	Qld NCA Status^	Habitat	Likelihood of occurrence within Study Area#
			<i>.erythrophloia</i> , <i>C. xanthope</i> and <i>E. fibrosa</i> (DoEE 2020). Records are currently constrained to Rockhampton and surrounds.	
<i>Dichanthium setosum</i> bluegrass	V	LC	<i>D. setosum</i> is associated with heavy basaltic black soils and red-brown loams with clay subsoil (DoEE 2020). <i>D. setosum</i> is often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture. It is often collected from disturbed open grassy woodlands on the northern tablelands, where the habitat has been variously grazed, nutrient-enriched and water-enriched. No records from the study area or surrounds.	Unlikely
<i>Macadamia integrifolia</i> macadamia nut	V	V	The Macadamia Nut is found in remnant rainforest in northern NSW and south-east Queensland (DoEE 2020). No records from the study area or surrounds.	Unlikely
<i>Murraya crenulata</i>	–	E	Small tree or shrub also known as the Hervey Bay clausena or wampee. Little published information available on this species. Has been recorded at the Mon Repos Conservation Park (DES 2020b).	Unlikely – Possible
<i>Phaius australis</i> Lesser Swamp-orchid	E	E	Associated with coastal wet heath/sedgeland wetlands, swampy grassland or swampy forest, and often where <i>M. quinquinervia</i> or <i>E. robusta</i> are found. Typically, the orchid is restricted to swamp forest margins, mostly in coastal areas (DoEE 2020). No records from the study area or surrounds.	Possible
<i>Samadera bidwillii</i> Quassia	V	V	<i>S. bidwillii</i> commonly occurs in lowland rainforest often with <i>A. cunninghamii</i> or on rainforest margins, but it can also be found in other forest types, such as open forest and woodland. It is commonly found in areas adjacent to both temporary and permanent watercourses up to 510 m altitude (DoEE 2020). No records from the study area or surrounds.	Unlikely

Based on species listed in the PMST and Wildlife Online search (Appendix C) and using the likelihood of occurrence criteria presented in Table 2.1
 * Status under the EPBC Act: CE: Critically Endangered, E: Endangered, V: Vulnerable, NT: Near Threatened, M: Migratory, C: Cetacean, O: Marine
 ^ Status under the NCA: E: Endangered, V: Vulnerable, LC: least concern, SL: special least concern
 ^^ Listed under previous classification *Sousa chinesis* (Indo-pacific humpback dolphin) in the Protected Matters Search Tool report

Appendix C 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.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 04/06/20 10:17:26

[Summary](#)

[Details](#)

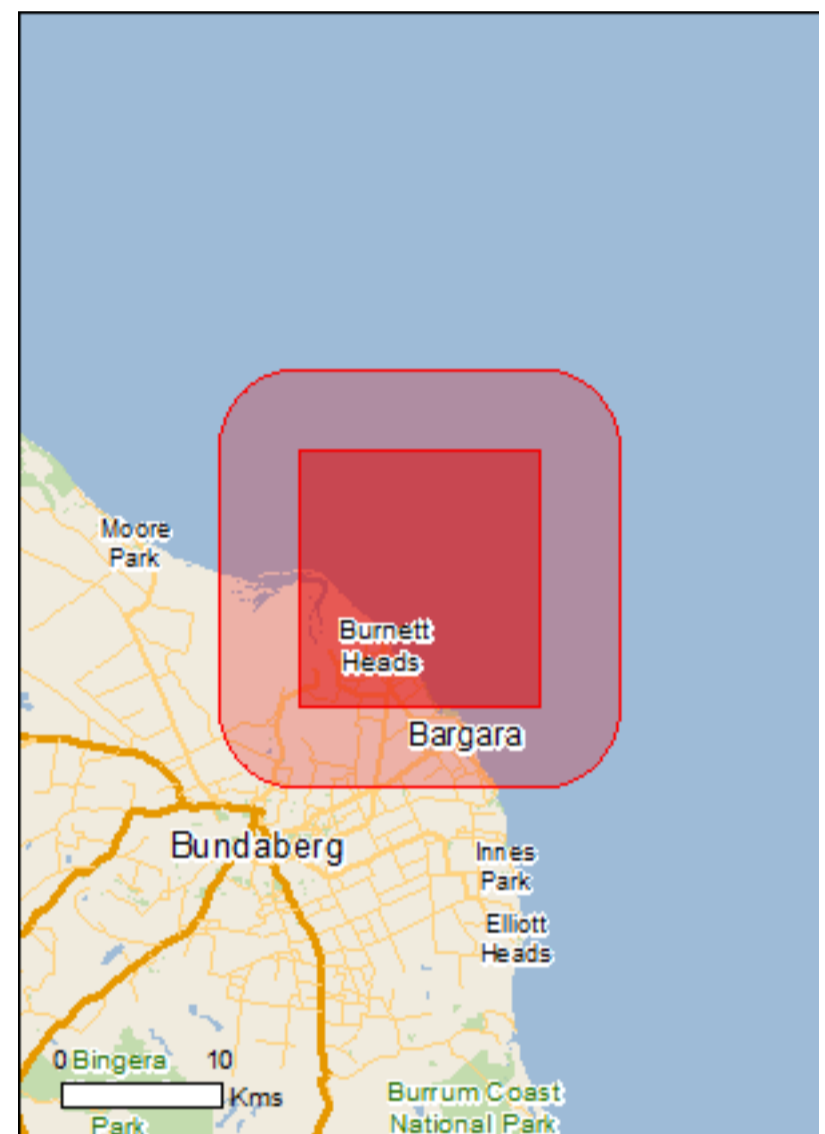
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

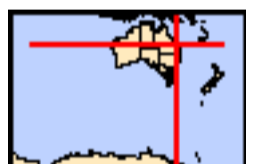
[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 5.0Km



Summary

Matters of National Environmental 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:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	58
Listed Migratory Species:	65

Other Matters Protected by the EPBC Act

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

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <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 Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	103
Whales and Other Cetaceans:	13
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	2
Regional Forest Agreements:	None
Invasive Species:	27
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside the Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area. Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

Name

EEZ and Territorial Sea

Marine Regions

[\[Resource Information \]](#)

If you are planning to undertake action in an area in or close to the Commonwealth Marine Area, and a marine bioregional plan has been prepared for the Commonwealth Marine Area in that area, the marine bioregional plan may inform your decision as to whether to refer your proposed action under the EPBC Act.

Name

[Temperate East](#)

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.

Name	Status	Type of Presence
Coastal Swamp Oak (<i>Casuarina glauca</i>) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area

Listed Threatened Species

[\[Resource Information \]](#)

Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Foraging, feeding or related behaviour known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area

Name	Status	Type of Presence
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
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
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Thalassarche cauta cauta Shy Albatross [82345]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Mammals		
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat may occur within 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]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Xeromys myoides Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat likely to occur within area
Plants		
Acacia attenuata [10690]	Vulnerable	Species or species habitat likely to occur within area
Cupaniopsis shirleyana Wedge-leaf Tuckeroo [3205]	Vulnerable	Species or species habitat known to occur within area
Cycas megacarpa [55794]	Endangered	Species or species habitat likely to occur within area
Cycas ophiolitica [55797]	Endangered	Species or species habitat may occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat may occur within 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

Name	Status	Type of Presence
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat likely to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat known to occur within area
Elseya albagula Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Sharks		
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Breeding may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat known to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species

Name	Threatened	Type of Presence
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		habitat likely to occur within area Foraging, feeding or related behaviour likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area
Thalassarche cauta Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Species or species habitat may occur within area
Migratory Marine Species		
Balaena glacialis australis Southern Right Whale [75529]	Endangered*	Species or species habitat likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area

Name	Threatened	Type of Presence
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat may occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Orcaella heinsohni Australian Snubfin Dolphin [81322]		Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Breeding may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Foraging, feeding or related behaviour likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur

Name	Threatened	Type of Presence within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Foraging, feeding or related behaviour known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Roosting may occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur

Name	Threatened	Type of Presence within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Foraging, feeding or related behaviour known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [\[Resource Information \]](#)

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat known to occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Breeding likely to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur

Name	Threatened	Type of Presence within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Foraging, feeding or related behaviour known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Roosting may occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Roosting known to occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Foraging, feeding or related behaviour known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur

Name	Threatened	Type of Presence within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour likely to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Foraging, feeding or related behaviour known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat known to occur within area
Sterna albifrons Little Tern [813]		Species or species habitat may occur within area
Thalassarche cauta Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Foraging, feeding or related behaviour known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area
Fish		
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area
Corythoichthys amplexus Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area
Corythoichthys ocellatus Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area
Micrognathus brevirostris thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area
Microphis manadensis Manado Pipefish, Manado River Pipefish [66258]		Species or species habitat may occur within area
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Mammals		
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Reptiles		
Acalyptophis peronii Horned Seasnake [1114]		Species or species habitat may occur within area
Aipysurus duboisii Dubois' Seasnake [1116]		Species or species habitat may occur within

Name	Threatened	Type of Presence area
Aipysurus eydouxii Spine-tailed Seasnake [1117]		Species or species habitat may occur within area
Aipysurus laevis Olive Seasnake [1120]		Species or species habitat may occur within area
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area
Disteira major Olive-headed Seasnake [1124]		Species or species habitat may occur within area
Emydocephalus annulatus Turtle-headed Seasnake [1125]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area
Laticauda colubrina a sea krait [1092]		Species or species habitat may occur within area
Laticauda laticaudata a sea krait [1093]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans

[Resource Information]

Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within

Name	Status	Type of Presence area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
Orcaella brevirostris Irrawaddy Dolphin [45]		Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Foraging, feeding or related behaviour likely to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Barubbra Island	QLD
Mon Repos	QLD

Invasive Species [[Resource Information](#)]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
Birds		
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
<i>Columba livia</i> Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
<i>Lonchura punctulata</i> Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
<i>Passer domesticus</i> House Sparrow [405]		Species or species habitat likely to occur within area
<i>Streptopelia chinensis</i> Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
<i>Sturnus vulgaris</i> Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
<i>Rhinella marina</i> Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
<i>Bos taurus</i> Domestic Cattle [16]		Species or species habitat likely to occur within area
<i>Canis lupus familiaris</i> Domestic Dog [82654]		Species or species habitat likely to occur within area
<i>Felis catus</i> Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
<i>Lepus capensis</i> Brown Hare [127]		Species or species habitat likely to occur within area
<i>Mus musculus</i> House Mouse [120]		Species or species habitat likely to occur within area
<i>Oryctolagus cuniculus</i> Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
<i>Sus scrofa</i> Pig [6]		Species or species habitat likely to occur within area
<i>Vulpes vulpes</i> Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
<i>Anredera cordifolia</i> Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
<i>Chrysanthemoides monilifera</i> Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
<i>Cryptostegia grandiflora</i> Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913]		Species or species habitat likely to occur within area
<i>Dolichandra unguis-cati</i> Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw		Species or species

Name	Status	Type of Presence
Creeper, Funnel Creeper [85119]		habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Jatropha gossypifolia Cotton-leaved Physic-Nut, Bellyache Bush, Cotton-leaf Physic Nut, Cotton-leaf Jatropha, Black Physic Nut [7507]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Reptiles		
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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.

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

Where very little information is available for 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 reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-24.66868 152.36633,-24.66868 152.50092,-24.80027 152.50092,-24.80027 152.36633,-24.66868 152.36633

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.

Please feel free to provide feedback via the [Contact Us](#) page.



Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Defined Area
Species: All
Type: All
Status: All
Records: All
Date: Since 1980
Latitude: 24.667 to 24.81
Longitude: 152.367 to 152.5
Email: gbraun@ecosp.com.au
Date submitted: Monday 03 Feb 2020 14:08:23
Date extracted: Monday 03 Feb 2020 14:10:02

The number of records retrieved = 272

Disclaimer

As the DSITIA is still in a process of collating and vetting data, it is possible the information given is not complete. The information provided should only be used for the project for which it was requested and it should be appropriately acknowledged as being derived from Wildlife Online when it is used.

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Feedback about Wildlife Online should be emailed to wildlife.online@science.dsitia.qld.gov.au

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Limnodynastidae	<i>Limnodynastes salmini</i>	salmon striped frog		C		1/1
animals	birds	Acanthizidae	<i>Acanthiza chrysorrhoa</i>	yellow-rumped thornbill		C		6
animals	birds	Acanthizidae	<i>Sericornis frontalis</i>	white-browed scrubwren		C		1
animals	birds	Acanthizidae	<i>Acanthiza reguloides</i>	buff-rumped thornbill		C		1
animals	birds	Acanthizidae	<i>Gerygone palpebrosa</i>	fairy gerygone		C		2
animals	birds	Acanthizidae	<i>Gerygone mouki</i>	brown gerygone		C		1
animals	birds	Acanthizidae	<i>Gerygone levigaster</i>	mangrove gerygone		C		9
animals	birds	Acanthizidae	<i>Gerygone olivacea</i>	white-throated gerygone		C		1
animals	birds	Accipitridae	<i>Milvus migrans</i>	black kite		C		9
animals	birds	Accipitridae	<i>Accipiter cirrocephalus</i>	collared sparrowhawk		C		2
animals	birds	Accipitridae	<i>Haliastur indus</i>	brahminy kite		C		43
animals	birds	Accipitridae	<i>Elanus axillaris</i>	black-shouldered kite		C		9
animals	birds	Accipitridae	<i>Pandion cristatus</i>	eastern osprey		SL		22
animals	birds	Accipitridae	<i>Accipiter fasciatus</i>	brown goshawk		C		1
animals	birds	Accipitridae	<i>Aviceda subcristata</i>	Pacific baza		C		1
animals	birds	Accipitridae	<i>Haliastur sphenurus</i>	whistling kite		C		21
animals	birds	Accipitridae	<i>Haliaeetus leucogaster</i>	white-bellied sea-eagle		C		15
animals	birds	Alaudidae	<i>Mirafra javanica</i>	Horsfield's bushlark		C		2
animals	birds	Alcedinidae	<i>Ceyx azureus</i>	azure kingfisher		C		1
animals	birds	Anatidae	<i>Dendrocygna arcuata</i>	wandering whistling-duck		C		1
animals	birds	Anatidae	<i>Dendrocygna eytoni</i>	plumed whistling-duck		C		2
animals	birds	Anatidae	<i>Chenonetta jubata</i>	Australian wood duck		C		20
animals	birds	Anatidae	<i>Anas superciliosa</i>	Pacific black duck		C		33
animals	birds	Anatidae	<i>Cygnus atratus</i>	black swan		C		5
animals	birds	Anatidae	<i>Radjah radjah</i>	radjah shelduck		C		6
animals	birds	Anatidae	<i>Anas gracilis</i>	grey teal		C		19
animals	birds	Anatidae	<i>Anas castanea</i>	chestnut teal		C		6
animals	birds	Anatidae	<i>Aythya australis</i>	hardhead		C		3
animals	birds	Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian darter		C		51
animals	birds	Ardeidae	<i>Bubulcus ibis</i>	cattle egret		C		17
animals	birds	Ardeidae	<i>Ardea intermedia</i>	intermediate egret		C		6
animals	birds	Ardeidae	<i>Egretta garzetta</i>	little egret		C		32
animals	birds	Ardeidae	<i>Butorides striata</i>	striated heron		C		29
animals	birds	Ardeidae	<i>Ardea alba modesta</i>	eastern great egret		C		47
animals	birds	Ardeidae	<i>Ixobrychus flavicollis</i>	black bittern		C		1
animals	birds	Ardeidae	<i>Nycticorax caledonicus</i>	nankeen night-heron		C		1
animals	birds	Ardeidae	<i>Egretta novaehollandiae</i>	white-faced heron		C		64
animals	birds	Ardeidae	<i>Egretta sacra</i>	eastern reef egret		C		5
animals	birds	Ardeidae	<i>Ardea pacifica</i>	white-necked heron		C		1
animals	birds	Artamidae	<i>Strepera graculina</i>	pieb currawong		C		2
animals	birds	Artamidae	<i>Cracticus torquatus</i>	grey butcherbird		C		10
animals	birds	Artamidae	<i>Artamus leucorhynchus</i>	white-breasted woodswallow		C		4
animals	birds	Artamidae	<i>Cracticus nigrogularis</i>	pieb butcherbird		C		30
animals	birds	Artamidae	<i>Gymnorhina tibicen</i>	Australian magpie		C		31
animals	birds	Burhinidae	<i>Esacus magnirostris</i>	beach stone-curlew		V		1
animals	birds	Cacatuidae	<i>Nymphicus hollandicus</i>	cockatiel		C		5

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Cacatuidae	<i>Eolophus roseicapilla</i>	galah		C		19
animals	birds	Cacatuidae	<i>Calyptorhynchus funereus</i>	yellow-tailed black-cockatoo		C		1
animals	birds	Cacatuidae	<i>Calyptorhynchus banksii</i>	red-tailed black-cockatoo		C		3
animals	birds	Campephagidae	<i>Coracina novaehollandiae</i>	black-faced cuckoo-shrike		C		23
animals	birds	Campephagidae	<i>Coracina papuensis</i>	white-bellied cuckoo-shrike		C		1
animals	birds	Campephagidae	<i>Lalage leucomela</i>	varied triller		C		4
animals	birds	Campephagidae	<i>Lalage tricolor</i>	white-winged triller		C		1
animals	birds	Charadriidae	<i>Charadrius bicinctus</i>	double-banded plover		SL		1
animals	birds	Charadriidae	<i>Erythrogonys cinctus</i>	red-kneed dotterel		C		3
animals	birds	Charadriidae	<i>Charadrius australis</i>	inland dotterel		C		2
animals	birds	Charadriidae	<i>Elseyornis melanops</i>	black-fronted dotterel		C		6
animals	birds	Charadriidae	<i>Charadrius mongolus</i>	lesser sand plover		E	E	11
animals	birds	Charadriidae	<i>Pluvialis fulva</i>	Pacific golden plover		SL		22
animals	birds	Charadriidae	<i>Vanellus miles</i>	masked lapwing		C		54
animals	birds	Charadriidae	<i>Vanellus miles novaehollandiae</i>	masked lapwing (southern subspecies)		C		12
animals	birds	Charadriidae	<i>Charadrius leschenaultii</i>	greater sand plover		V	V	18
animals	birds	Charadriidae	<i>Pluvialis squatarola</i>	grey plover		SL		1
animals	birds	Charadriidae	<i>Charadrius ruficapillus</i>	red-capped plover		C		41
animals	birds	Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	black-necked stork		C		2
animals	birds	Cisticolidae	<i>Cisticola exilis</i>	golden-headed cisticola		C		13
animals	birds	Columbidae	<i>Columba livia</i>	rock dove	Y			5
animals	birds	Columbidae	<i>Geopelia striata</i>	peaceful dove		C		28
animals	birds	Columbidae	<i>Ocyphaps lophotes</i>	crested pigeon		C		34
animals	birds	Columbidae	<i>Phaps chalcoptera</i>	common bronzewing		C		1
animals	birds	Columbidae	<i>Ptilinopus regina</i>	rose-crowned fruit-dove		C		2
animals	birds	Columbidae	<i>Chalcophaps indica</i>	emerald dove		C		1
animals	birds	Columbidae	<i>Geopelia humeralis</i>	bar-shouldered dove		C		28
animals	birds	Columbidae	<i>Macropygia amboinensis</i>	brown cuckoo-dove		C		1
animals	birds	Columbidae	<i>Streptopelia chinensis</i>	spotted dove	Y			8
animals	birds	Coraciidae	<i>Eurystomus orientalis</i>	dollarbird		C		11
animals	birds	Corvidae	<i>Corvus orru</i>	Torresian crow		C		11
animals	birds	Corvidae	<i>Corvus sp.</i>					1
animals	birds	Cuculidae	<i>Centropus phasianinus</i>	pheasant coucal		C		13
animals	birds	Cuculidae	<i>Cacomantis flabelliformis</i>	fan-tailed cuckoo		C		1
animals	birds	Cuculidae	<i>Eudynamys orientalis</i>	eastern koel		C		16
animals	birds	Cuculidae	<i>Scythrops novaehollandiae</i>	channel-billed cuckoo		C		7
animals	birds	Cuculidae	<i>Chalcites lucidus</i>	shining bronze-cuckoo		C		1
animals	birds	Cuculidae	<i>Cacomantis pallidus</i>	pallid cuckoo		C		3
animals	birds	Dicruridae	<i>Dicrurus bracteatus</i>	spangled drongo		C		15
animals	birds	Diomedeidae	<i>Diomedea exulans</i>	wandering albatross		V	V	1
animals	birds	Estrildidae	<i>Lonchura punctulata</i>	nutmeg mannikin	Y			6
animals	birds	Estrildidae	<i>Lonchura castaneothorax</i>	chestnut-breasted mannikin		C		3
animals	birds	Estrildidae	<i>Taeniopygia bichenovii</i>	double-barred finch		C		15
animals	birds	Estrildidae	<i>Taeniopygia guttata</i>	zebra finch		C		3
animals	birds	Falconidae	<i>Falco berigora</i>	brown falcon		C		4
animals	birds	Falconidae	<i>Falco longipennis</i>	Australian hobby		C		2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Falconidae	<i>Falco cenchroides</i>	nankeen kestrel		C		6
animals	birds	Glareolidae	<i>Glareola maldivarum</i>	oriental pratincole		SL		1
animals	birds	Gruidae	<i>Antigone rubicunda</i>	broilga		C		2
animals	birds	Haematopodidae	<i>Haematopus longirostris</i>	Australian pied oystercatcher		C		30
animals	birds	Haematopodidae	<i>Haematopus fuliginosus</i>	sooty oystercatcher		C		5
animals	birds	Halcyonidae	<i>Todiramphus sordidus</i>	Torresian kingfisher		C		23
animals	birds	Halcyonidae	<i>Todiramphus macleayii</i>	forest kingfisher		C		3
animals	birds	Halcyonidae	<i>Dacelo leachii</i>	blue-winged kookaburra		C		2
animals	birds	Halcyonidae	<i>Dacelo novaeguineae</i>	laughing kookaburra		C		17
animals	birds	Halcyonidae	<i>Todiramphus sanctus</i>	sacred kingfisher		C		16
animals	birds	Hirundinidae	<i>Petrochelidon nigricans</i>	tree martin		C		7
animals	birds	Hirundinidae	<i>Petrochelidon ariel</i>	fairy martin		C		8
animals	birds	Hirundinidae	<i>Hirundo neoxena</i>	welcome swallow		C		21
animals	birds	Laridae	<i>Sterna hirundo</i>	common tern		SL		3
animals	birds	Laridae	<i>Thalasseus bergii</i>	crested tern		SL		76
animals	birds	Laridae	<i>Chlidonias hybrida</i>	whiskered tern		C		3
animals	birds	Laridae	<i>Hydroprogne caspia</i>	Caspian tern		SL		30
animals	birds	Laridae	<i>Chroicocephalus novaehollandiae</i>	silver gull		C		88
animals	birds	Laridae	<i>Gelochelidon nilotica</i>	gull-billed tern		SL		21
animals	birds	Laridae	<i>Chlidonias leucopterus</i>	white-winged black tern		SL		1
animals	birds	Laridae	<i>Thalasseus bengalensis</i>	lesser crested tern		C		3
animals	birds	Laridae	<i>Sternula albifrons</i>	little tern		SL		10
animals	birds	Maluridae	<i>Malurus cyaneus</i>	superb fairy-wren		C		5
animals	birds	Maluridae	<i>Malurus lamberti</i>	variegated fairy-wren		C		1
animals	birds	Maluridae	<i>Malurus melanocephalus</i>	red-backed fairy-wren		C		24
animals	birds	Megaluridae	<i>Cincloramphus mathewsi</i>	rufous songlark		C		1
animals	birds	Megaluridae	<i>Cincloramphus cruralis</i>	brown songlark		C		1
animals	birds	Megaluridae	<i>Megalurus timoriensis</i>	tawny grassbird		C		4
animals	birds	Megaluridae	<i>Megalurus gramineus</i>	little grassbird		C		1
animals	birds	Megapodiidae	<i>Alectura lathami</i>	Australian brush-turkey		C		5
animals	birds	Meliphagidae	<i>Melithreptus albogularis</i>	white-throated honeyeater		C		3
animals	birds	Meliphagidae	<i>Plectorhyncha lanceolata</i>	striped honeyeater		C		2
animals	birds	Meliphagidae	<i>Acanthorhynchus tenuirostris</i>	eastern spinebill		C		1
animals	birds	Meliphagidae	<i>Gavicalis fasciogularis</i>	mangrove honeyeater		C		7
animals	birds	Meliphagidae	<i>Philemon citreogularis</i>	little friarbird		C		5
animals	birds	Meliphagidae	<i>Myzomela sanguinolenta</i>	scarlet honeyeater		C		1
animals	birds	Meliphagidae	<i>Manorina melanocephala</i>	noisy miner		C		23
animals	birds	Meliphagidae	<i>Philemon corniculatus</i>	noisy friarbird		C		1
animals	birds	Meliphagidae	<i>Lichmera indistincta</i>	brown honeyeater		C		24
animals	birds	Meliphagidae	<i>Entomyzon cyanotis</i>	blue-faced honeyeater		C		11
animals	birds	Meliphagidae	<i>Meliphaga lewinii</i>	Lewin's honeyeater		C		6
animals	birds	Meliphagidae	<i>Myzomela obscura</i>	dusky honeyeater		C		1
animals	birds	Meropidae	<i>Merops ornatus</i>	rainbow bee-eater		C		28
animals	birds	Monarchidae	<i>Grallina cyanoleuca</i>	magpie-lark		C		25
animals	birds	Monarchidae	<i>Monarcha melanopsis</i>	black-faced monarch		SL		1
animals	birds	Monarchidae	<i>Myiagra rubecula</i>	leaden flycatcher		C		6

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Monarchidae	<i>Myiagra cyanoleuca</i>	satin flycatcher		SL		2
animals	birds	Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian pipit		C		12
animals	birds	Nectariniidae	<i>Dicaeum hirundinaceum</i>	mistletoebird		C		9
animals	birds	Oriolidae	<i>Sphecotheres vieilloti</i>	Australasian figbird		C		27
animals	birds	Oriolidae	<i>Oriolus sagittatus</i>	olive-backed oriole		C		11
animals	birds	Pachycephalidae	<i>Pachycephala rufiventris</i>	rufous whistler		C		14
animals	birds	Pachycephalidae	<i>Pachycephala pectoralis</i>	golden whistler		C		4
animals	birds	Pachycephalidae	<i>Colluricincla megarhyncha</i>	little shrike-thrush		C		1
animals	birds	Pachycephalidae	<i>Colluricincla harmonica</i>	grey shrike-thrush		C		13
animals	birds	Pardalotidae	<i>Pardalotus striatus</i>	striated pardalote		C		7
animals	birds	Pardalotidae	<i>Pardalotus punctatus</i>	spotted pardalote		C		1
animals	birds	Passeridae	<i>Passer domesticus</i>	house sparrow	Y			10
animals	birds	Pelecanidae	<i>Pelecanus conspicillatus</i>	Australian pelican		C		77
animals	birds	Petroicidae	<i>Eopsaltria australis</i>	eastern yellow robin		C		1
animals	birds	Petroicidae	<i>Microeca fascinans</i>	jacky winter		C		1
animals	birds	Phalacrocoracidae	<i>Phalacrocorax carbo</i>	great cormorant		C		5
animals	birds	Phalacrocoracidae	<i>Phalacrocorax varius</i>	piebald cormorant		C		65
animals	birds	Phalacrocoracidae	<i>Phalacrocorax sulcirostris</i>	little black cormorant		C		11
animals	birds	Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	little pied cormorant		C		17
animals	birds	Phasianidae	<i>Coturnix ypsilophora</i>	brown quail		C		5
animals	birds	Podargidae	<i>Podargus strigoides</i>	tawny frogmouth		C		7
animals	birds	Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian grebe		C		6
animals	birds	Pomatostomidae	<i>Pomatostomus temporalis</i>	grey-crowned babbler		C		1
animals	birds	Procellariidae	<i>Ardenna tenuirostris</i>	short-tailed shearwater		SL		7
animals	birds	Procellariidae	<i>Puffinus sp.</i>					9
animals	birds	Psittacidae	<i>Trichoglossus haematodus moluccanus</i>	rainbow lorikeet		C		26
animals	birds	Psittacidae	<i>Trichoglossus chlorolepidotus</i>	scaly-breasted lorikeet		C		11
animals	birds	Psittacidae	<i>Platycercus adscitus</i>	pale-headed rosella		C		26
animals	birds	Rallidae	<i>Fulica atra</i>	Eurasian coot		C		1
animals	birds	Rallidae	<i>Amaurornis moluccana</i>	pale-vented bush-hen		C		1
animals	birds	Rallidae	<i>Porphyrio melanotus</i>	purple swamphen		C		5
animals	birds	Rallidae	<i>Gallinula tenebrosa</i>	dusky moorhen		C		9
animals	birds	Rallidae	<i>Lewinia pectoralis</i>	Lewin's rail		C		1
animals	birds	Rallidae	<i>Gallirallus philippensis</i>	buff-banded rail		C		3
animals	birds	Recurvirostridae	<i>Recurvirostra novaehollandiae</i>	red-necked avocet		C		1
animals	birds	Recurvirostridae	<i>Himantopus himantopus</i>	black-winged stilt		C		43
animals	birds	Rhipiduridae	<i>Rhipidura leucophrys</i>	willie wagtail		C		35
animals	birds	Rhipiduridae	<i>Rhipidura rufifrons</i>	rufous fantail		SL		2
animals	birds	Rhipiduridae	<i>Rhipidura albiscapa</i>	grey fantail		C		7
animals	birds	Scolopacidae	<i>Tringa sp.</i>					1
animals	birds	Scolopacidae	<i>Calidris alba</i>	sanderling		SL		1
animals	birds	Scolopacidae	<i>Limosa limosa</i>	black-tailed godwit		SL		1
animals	birds	Scolopacidae	<i>Tringa incana</i>	wandering tattler		SL		2
animals	birds	Scolopacidae	<i>Xenus cinereus</i>	terek sandpiper		SL		25
animals	birds	Scolopacidae	<i>Tringa brevipes</i>	grey-tailed tattler		SL		20
animals	birds	Scolopacidae	<i>Numenius minutus</i>	little curlew		SL		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Scolopacidae	<i>Tringa nebularia</i>	common greenshank		SL		30
animals	birds	Scolopacidae	<i>Numenius phaeopus</i>	whimbrel		SL		72
animals	birds	Scolopacidae	<i>Actitis hypoleucos</i>	common sandpiper		SL		4
animals	birds	Scolopacidae	<i>Arenaria interpres</i>	ruddy turnstone		SL		1
animals	birds	Scolopacidae	<i>Calidris acuminata</i>	sharp-tailed sandpiper		SL		34
animals	birds	Scolopacidae	<i>Calidris melanotos</i>	pectoral sandpiper		SL		1
animals	birds	Scolopacidae	<i>Tringa stagnatilis</i>	marsh sandpiper		SL		14
animals	birds	Scolopacidae	<i>Calidris ferruginea</i>	curlew sandpiper		E	CE	21
animals	birds	Scolopacidae	<i>Calidris ruficollis</i>	red-necked stint		SL		31
animals	birds	Scolopacidae	<i>Calidris falcinellus</i>	broad-billed sandpiper		SL		1
animals	birds	Scolopacidae	<i>Gallinago hardwickii</i>	Latham's snipe		SL		3
animals	birds	Scolopacidae	<i>Calidris tenuirostris</i>	great knot		E	CE	3
animals	birds	Scolopacidae	<i>Limosa lapponica baueri</i>	Western Alaskan bar-tailed godwit		V	V	56
animals	birds	Scolopacidae	<i>Limnodromus semipalmatus</i>	Asian dowitcher		SL		1
animals	birds	Scolopacidae	<i>Numenius madagascariensis</i>	eastern curlew		E	CE	62
animals	birds	Strigidae	<i>Ninox boobook</i>	southern boobook		C		1
animals	birds	Sturnidae	<i>Sturnus vulgaris</i>	common starling	Y			7
animals	birds	Sulidae	<i>Morus serrator</i>	Australasian gannet		C		6
animals	birds	Sulidae	<i>Sula leucogaster</i>	brown booby		SL		8
animals	birds	Threskiornithidae	<i>Threskiornis molucca</i>	Australian white ibis		C		60
animals	birds	Threskiornithidae	<i>Threskiornis spinicollis</i>	straw-necked ibis		C		12
animals	birds	Threskiornithidae	<i>Plegadis falcinellus</i>	glossy ibis		SL		13
animals	birds	Threskiornithidae	<i>Platalea flavipes</i>	yellow-billed spoonbill		C		1
animals	birds	Threskiornithidae	<i>Platalea regia</i>	royal spoonbill		C		31
animals	birds	Timaliidae	<i>Zosterops lateralis</i>	silveryeye		C		15
animals	malacostracans	Mictyridae	<i>Mictyris longicarpus</i>					2
animals	mammals	Canidae	<i>Vulpes vulpes</i>	red fox	Y			1
animals	mammals	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna		SL		1
animals	reptiles	Cheloniidae	<i>Caretta caretta</i>	loggerhead turtle		E	E	4
animals	reptiles	Elapidae	<i>Pseudonaja textilis</i>	eastern brown snake		C		1
animals	reptiles	Varanidae	<i>Varanus gouldii</i>	sand monitor		C		1
animals	uncertain	Indeterminate	<i>Indeterminate</i>	Unknown or Code Pending		C		1
chromists	brown algae	Dictyotaceae	<i>Dictyota intermedia</i>			C		1/1
chromists	brown algae	Dictyotaceae	<i>Dictyopteris delicatula</i>			C		1/1
chromists	brown algae	Dictyotaceae	<i>Zonaria diesingiana</i>			C		1/1
chromists	brown algae	Dictyotaceae	<i>Lobophora variegata</i>			C		1/1
plants	Florideophyceae	Galaxauraceae	<i>Tricleocarpa fragilis</i>			C		1/1
plants	Ulvophyceae	Cladophoraceae	<i>Cladophora prolifera</i>			C		1/1
plants	land plants	Aizoaceae	<i>Sesuvium portulacastrum</i>	sea purslane		C		1/1
plants	land plants	Anacardiaceae	<i>Schinus terebinthifolius</i>		Y			1/1
plants	land plants	Anacardiaceae	<i>Pleiogynium timorense</i>	Burdekin plum		C		1/1
plants	land plants	Apocynaceae	<i>Secamone elliptica</i>			C		1/1
plants	land plants	Araliaceae	<i>Polyscias elegans</i>	celery wood		C		1/1
plants	land plants	Asteraceae	<i>Eclipta platyglossa subsp. platyglossa</i>			C		1/1
plants	land plants	Asteraceae	<i>Pseudognaphalium luteoalbum</i>	Jersey cudweed		C		1/1
plants	land plants	Asteraceae	<i>Gamochaeta purpurea</i>		Y			1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Boraginaceae	<i>Argusia argentea</i>	octopus bush		C		1/1
plants	land plants	Brassicaceae	<i>Rorippa laciniata</i>			C		1/1
plants	land plants	Byttneriaceae	<i>Waltheria indica</i>			C		1/1
plants	land plants	Colchicaceae	<i>Gloriosa superba</i>	glory lily	Y			1/1
plants	land plants	Convolvulaceae	<i>Polymeria calycina</i>	pink bindweed		C		1/1
plants	land plants	Cyperaceae	<i>Eleocharis dietriciana</i>			C		1/1
plants	land plants	Dracaenaceae	<i>Sansevieria trifasciata var. trifasciata</i>		Y			1/1
plants	land plants	Euphorbiaceae	<i>Mallotus discolor</i>	white kamala		C		1/1
plants	land plants	Euphorbiaceae	<i>Euphorbia cyathophora</i>	dwarf poinsettia	Y			1/1
plants	land plants	Fabaceae	<i>Zornia dyctiocarpa var. dyctiocarpa</i>			C		1/1
plants	land plants	Fabaceae	<i>Lablab purpureus</i>	lablab	Y			1/1
plants	land plants	Fabaceae	<i>Indigofera spicata</i>	creeping indigo	Y			1/1
plants	land plants	Goodeniaceae	<i>Scaevola taccada</i>	Cardwell cabbage			C	1/1
plants	land plants	Hypoxidaceae	<i>Hypoxis pratensis</i>				C	1/1
plants	land plants	Lamiaceae	<i>Vitex rotundifolia</i>				C	1/1
plants	land plants	Lamiaceae	<i>Vitex trifolia</i>				C	1/1
plants	land plants	Lentibulariaceae	<i>Utricularia stellaris</i>				C	1/1
plants	land plants	Linderniaceae	<i>Lindernia procumbens</i>				C	1/1
plants	land plants	Molluginaceae	<i>Glinus oppositifolius</i>				C	1/1
plants	land plants	Moraceae	<i>Maclura cochinchinensis</i>	cockspur thorn			C	1/1
plants	land plants	Myrsinaceae	<i>Aegiceras corniculatum</i>	river mangrove			C	1/1
plants	land plants	Myrtaceae	<i>Melaleuca quinquenervia</i>	swamp paperbark			C	1/1
plants	land plants	Myrtaceae	<i>Eugenia uniflora</i>	Brazilian cherry tree	Y			1/1
plants	land plants	Myrtaceae	<i>Lophostemon suaveolens</i>	swamp box			C	1/1
plants	land plants	Nyctaginaceae	<i>Boerhavia</i>					1/1
plants	land plants	Onagraceae	<i>Ludwigia octovalvis</i>	willow primrose			C	1/1
plants	land plants	Orthotrichaceae	<i>Macromitrium involutifolium subsp. ptychomitrioides</i>				C	1/1
plants	land plants	Passifloraceae	<i>Passiflora aurantia var. aurantia</i>				C	1/1
plants	land plants	Phyllanthaceae	<i>Bridelia leichhardtii</i>				C	1/1
plants	land plants	Picrodendraceae	<i>Petalostigma pubescens</i>	quinine tree			C	1/1
plants	land plants	Plumbaginaceae	<i>Aegialitis annulata</i>	club mangrove			C	1/1
plants	land plants	Plumbaginaceae	<i>Limonium solanderi</i>				C	1/1
plants	land plants	Poaceae	<i>Megathyrsus maximus var. pubiglumis</i>		Y			1/1
plants	land plants	Poaceae	<i>Elionurus citreus</i>	lemon-scented grass			C	1/1
plants	land plants	Polygonaceae	<i>Polygonum plebeium</i>	small knotweed			C	1/1
plants	land plants	Polygonaceae	<i>Persicaria decipiens</i>	slender knotweed			C	1/1
plants	land plants	Rubiaceae	<i>Dentella repens</i>	dentella			C	1/1
plants	land plants	Rutaceae	<i>Murraya paniculata 'Exotica'</i>		Y			1/1
plants	land plants	Rutaceae	<i>Acronychia imperforata</i>	beach acronychia			C	1/1
plants	land plants	Rutaceae	<i>Murraya crenulata</i>				E	2/2
plants	land plants	Sapindaceae	<i>Alectryon subdentatus</i>				C	1/1
plants	land plants	Verbenaceae	<i>Duranta erecta</i>	duranta	Y			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 in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ().

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

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).

This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.

This number is output as 999 if it equals or exceeds this value.

Birdata Database search results for study area

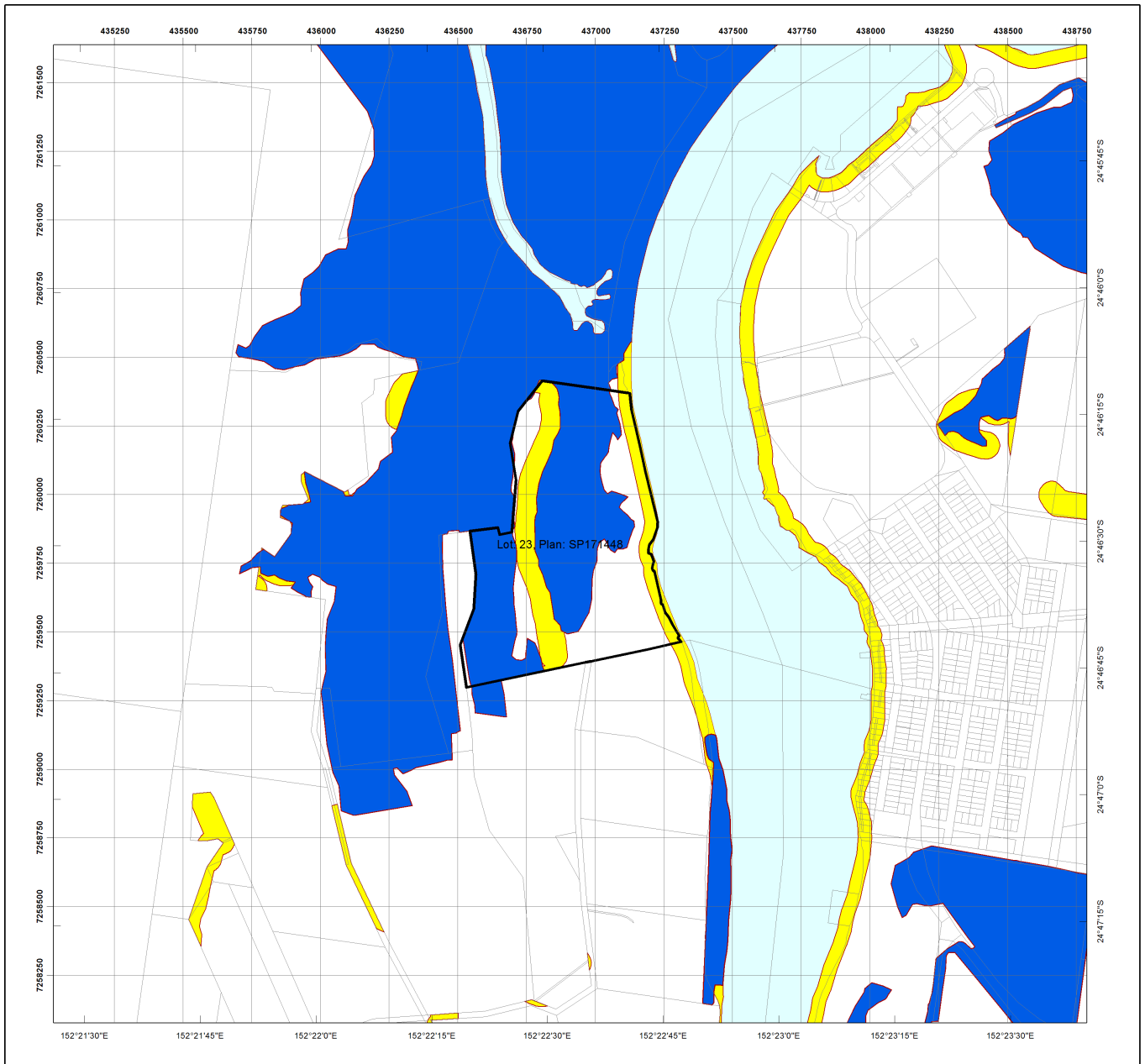
Common Name	Scientific Name	Count	Reporting Rate
Magpie Goose	<i>Anseranas semipalmata</i>	3	0.43%
Plumed Whistling-Duck	<i>Dendrocygna eytoni</i>	33	4.73%
Wandering Whistling-Duck	<i>Dendrocygna arcuata</i>	1	0.14%
Pink-eared Duck	<i>Malacorhynchus membranaceus</i>	7	1.00%
Black Swan	<i>Cygnus atratus</i>	50	7.17%
Radjah Shelduck	<i>Radjah radjah</i>	2	0.29%
Hardhead	<i>Aythya australis</i>	39	5.60%
Australasian Shoveler	<i>Spatula rhynchotis</i>	9	1.29%
Pacific Black Duck	<i>Anas superciliosa</i>	207	29.70%
Grey Teal	<i>Anas gracilis</i>	165	23.67%
Chestnut Teal	<i>Anas castanea</i>	162	23.24%
Australian Wood Duck	<i>Chenonetta jubata</i>	106	15.21%
Australian Brush-turkey	<i>Alectura lathamii</i>	4	0.57%
Brown Quail	<i>Synoicus ypsilophora</i>	79	11.33%
Australasian Grebe	<i>Tachybaptus novaehollandiae</i>	70	10.04%
Rock Dove	<i>Columba livia</i>	37	5.31%
Spotted Dove	<i>Streptopelia chinensis</i>	119	17.07%
Common Bronzewing	<i>Phaps chalcoptera</i>	1	0.14%
Crested Pigeon	<i>Ocyphaps lophotes</i>	176	25.25%
Peaceful Dove	<i>Geopelia placida</i>	152	21.81%
Bar-shouldered Dove	<i>Geopelia humeralis</i>	160	22.96%
Rose-crowned Fruit-Dove	<i>Ptilinopus regina</i>	1	0.14%
Pheasant Coucal	<i>Centropus phasianinus</i>	64	9.18%
Eastern Koel	<i>Eudynamis orientalis</i>	77	11.05%
Channel-billed Cuckoo	<i>Scythrops novaehollandiae</i>	18	2.58%
Horsfield's Bronze-Cuckoo	<i>Chalcites basalis</i>	12	1.72%
Little Bronze-Cuckoo	<i>Chalcites minutillus</i>	1	0.14%
Fan-tailed Cuckoo	<i>Cacomantis flabelliformis</i>	1	0.14%
Brush Cuckoo	<i>Cacomantis variolosus</i>	13	1.87%
Pallid Cuckoo	<i>Heteroscenes pallidus</i>	7	1.00%
Tawny Frogmouth	<i>Podargus strigoides</i>	2	0.29%
Large-tailed Nightjar	<i>Caprimulgus macrurus</i>	1	0.14%
White-throated Needletail	<i>Hirundapus caudacutus</i>	1	0.14%
Fork-tailed Swift	<i>Apus pacificus</i>	5	0.72%
Lewin's Rail	<i>Lewinia pectoralis</i>	3	0.43%
Buff-banded Rail	<i>Hypotaenidia philippensis</i>	43	6.17%
Australian Spotted Crake	<i>Porzana fluminea</i>	2	0.29%
Baillon's Crake	<i>Zapornia pusilla</i>	2	0.29%
Spotless Crake	<i>Zapornia tabuensis</i>	3	0.43%
Purple Swampphen	<i>Porphyrio porphyrio</i>	46	6.60%
Dusky Moorhen	<i>Gallinula tenebrosa</i>	34	4.88%
Eurasian Coot	<i>Fulica atra</i>	8	1.15%
Brolga	<i>Antigone rubicunda</i>	11	1.58%
Beach Stone-curlew	<i>Esacus magnirostris</i>	4	0.57%
Australian Pied Oystercatcher	<i>Haematopus longirostris</i>	133	19.08%

Sooty Oystercatcher	<i>Haematopus fuliginosus</i>	17	2.44%
Red-necked Avocet	<i>Recurvirostra novaehollandiae</i>	17	2.44%
Black-winged Stilt	<i>Himantopus leucocephalus</i>	236	33.86%
Grey Plover	<i>Pluvialis squatarola</i>	3	0.43%
Pacific Golden Plover	<i>Pluvialis fulva</i>	106	15.21%
Red-capped Plover	<i>Charadrius ruficapillus</i>	260	37.30%
Double-banded Plover	<i>Charadrius bicinctus</i>	26	3.73%
Lesser Sand Plover	<i>Charadrius mongolus</i>	41	5.88%
Greater Sand Plover	<i>Charadrius leschenaultii</i>	59	8.46%
Black-fronted Dotterel	<i>Elseyaornis melanops</i>	87	12.48%
Masked Lapwing	<i>Vanellus miles</i>	312	44.76%
Red-kneed Dotterel	<i>Erythrogonys cinctus</i>	57	8.18%
Australian Painted Snipe	<i>Rostratula australis</i>	1	0.14%
Comb-crested Jacana	<i>Irediparra gallinacea</i>	1	0.14%
Whimbrel	<i>Numenius phaeopus</i>	318	45.62%
Eastern Curlew	<i>Numenius madagascariensis</i>	276	39.60%
Bar-tailed Godwit	<i>Limosa lapponica</i>	253	36.30%
Black-tailed Godwit	<i>Limosa limosa</i>	45	6.46%
Ruddy Turnstone	<i>Arenaria interpres</i>	6	0.86%
Great Knot	<i>Calidris tenuirostris</i>	14	2.01%
Red Knot	<i>Calidris canutus</i>	13	1.87%
Broad-billed Sandpiper	<i>Calidris falcinellus</i>	23	3.30%
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	214	30.70%
Curlew Sandpiper	<i>Calidris ferruginea</i>	173	24.82%
Red-necked Stint	<i>Calidris ruficollis</i>	219	31.42%
Buff-breasted Sandpiper	<i>Calidris subruficollis</i>	2	0.29%
Pectoral Sandpiper	<i>Calidris melanotos</i>	12	1.72%
Asian Dowitcher	<i>Limnodromus semipalmatus</i>	13	1.87%
Latham's Snipe	<i>Gallinago hardwickii</i>	18	2.58%
Terek Sandpiper	<i>Xenus cinereus</i>	92	13.20%
Common Sandpiper	<i>Actitis hypoleucos</i>	9	1.29%
Grey-tailed Tattler	<i>Tringa brevipes</i>	100	14.35%
Wandering Tattler	<i>Tringa incana</i>	4	0.57%
Common Greenshank	<i>Tringa nebularia</i>	198	28.41%
Wood Sandpiper	<i>Tringa glareola</i>	11	1.58%
Marsh Sandpiper	<i>Tringa stagnatilis</i>	131	18.79%
Red-chested Button-quail	<i>Turnix pyrrhothorax</i>	1	0.14%
Common Noddy	<i>Anous stolidus</i>	1	0.14%
Silver Gull	<i>Chroicocephalus novaehollandiae</i>	280	40.17%
Little Tern	<i>Sternula albifrons</i>	59	8.46%
Australian Gull-billed Tern	<i>Gelochelidon macrotarsa</i>	167	23.96%
Caspian Tern	<i>Hydroprogne caspia</i>	185	26.54%
Whiskered Tern	<i>Chlidonias hybrida</i>	22	3.16%
White-winged Black Tern	<i>Chlidonias leucopterus</i>	3	0.43%
Common Tern	<i>Sterna hirundo</i>	8	1.15%
Lesser Crested Tern	<i>Thalasseus bengalensis</i>	9	1.29%

Crested Tern	<i>Thalasseus bergii</i>	211	30.27%
Wedge-tailed Shearwater	<i>Ardenna pacifica</i>	2	0.29%
Short-tailed Shearwater	<i>Ardenna tenuirostris</i>	1	0.14%
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	20	2.87%
Australian Pelican	<i>Pelecanus conspicillatus</i>	299	42.90%
Black Bittern	<i>Ixobrychus flavicollis</i>	2	0.29%
Nankeen Night-Heron	<i>Nycticorax caledonicus</i>	8	1.15%
Striated Heron	<i>Butorides striata</i>	87	12.48%
Cattle Egret	<i>Bubulcus ibis</i>	170	24.39%
White-necked Heron	<i>Ardea pacifica</i>	24	3.44%
Great Egret	<i>Ardea alba</i>	230	33.00%
Intermediate Egret	<i>Ardea intermedia</i>	140	20.09%
White-faced Heron	<i>Egretta novaehollandiae</i>	283	40.60%
Little Egret	<i>Egretta garzetta</i>	215	30.85%
Eastern Reef Egret	<i>Egretta sacra</i>	13	1.87%
Australian White Ibis	<i>Threskiornis moluccus</i>	264	37.88%
Straw-necked Ibis	<i>Threskiornis spinicollis</i>	127	18.22%
Yellow-billed Spoonbill	<i>Platalea flavipes</i>	11	1.58%
Royal Spoonbill	<i>Platalea regia</i>	218	31.28%
Glossy Ibis	<i>Plegadis falcinellus</i>	46	6.60%
Australasian Gannet	<i>Morus serrator</i>	17	2.44%
Brown Booby	<i>Sula leucogaster</i>	32	4.59%
Little Pied Cormorant	<i>Microcarbo melanoleucos</i>	139	19.94%
Great Cormorant	<i>Phalacrocorax carbo</i>	15	2.15%
Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>	165	23.67%
Pied Cormorant	<i>Phalacrocorax varius</i>	159	22.81%
Australasian Darter	<i>Anhinga novaehollandiae</i>	142	20.37%
Osprey	<i>Pandion haliaetus</i>	129	18.51%
Black-shouldered Kite	<i>Elanus axillaris</i>	80	11.48%
Square-tailed Kite	<i>Lophoictinia isura</i>	1	0.14%
Pacific Baza	<i>Aviceda subcristata</i>	7	1.00%
Wedge-tailed Eagle	<i>Aquila audax</i>	4	0.57%
Little Eagle	<i>Hieraaetus morphnoides</i>	3	0.43%
Swamp Harrier	<i>Circus approximans</i>	22	3.16%
Spotted Harrier	<i>Circus assimilis</i>	23	3.30%
Brown Goshawk	<i>Accipiter fasciatus</i>	37	5.31%
Collared Sparrowhawk	<i>Accipiter cirrocephalus</i>	14	2.01%
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	121	17.36%
Whistling Kite	<i>Haliastur sphenurus</i>	127	18.22%
Brahminy Kite	<i>Haliastur indus</i>	230	33.00%
Black Kite	<i>Milvus migrans</i>	132	18.94%
Rainbow Bee-eater	<i>Merops ornatus</i>	122	17.50%
Dollarbird	<i>Eurystomus orientalis</i>	24	3.44%
Forest Kingfisher	<i>Todiramphus macleayii</i>	8	1.15%
Collared Kingfisher	<i>Todiramphus chloris</i>	113	16.21%
Sacred Kingfisher	<i>Todiramphus sanctus</i>	65	9.33%










Laughing Kookaburra	<i>Dacelo novaeguineae</i>	65	9.33%
Nankeen Kestrel	<i>Falco cenchroides</i>	134	19.23%
Australian Hobby	<i>Falco longipennis</i>	29	4.16%
Brown Falcon	<i>Falco berigora</i>	24	3.44%
Black Falcon	<i>Falco subniger</i>	5	0.72%
Peregrine Falcon	<i>Falco peregrinus</i>	13	1.87%
Cockatiel	<i>Nymphicus hollandicus</i>	4	0.57%
Red-tailed Black-Cockatoo	<i>Calyptorhynchus banksii</i>	11	1.58%
Galah	<i>Eolophus roseicapilla</i>	145	20.80%
Red-winged Parrot	<i>Aprosmictus erythropterus</i>	1	0.14%
Pale-headed Rosella	<i>Platyercus adscitus</i>	61	8.75%
Rainbow Lorikeet	<i>Trichoglossus moluccanus</i>	178	25.54%
Scaly-breasted Lorikeet	<i>Trichoglossus chlorolepidotus</i>	72	10.33%
Brown Treecreeper	<i>Climacteris picumnus</i>	1	0.14%
Variiegated Fairy-wren	<i>Malurus lamberti</i>	2	0.29%
Superb Fairy-wren	<i>Malurus cyaneus</i>	5	0.72%
Red-backed Fairy-wren	<i>Malurus melanocephalus</i>	114	16.36%
Scarlet Honeyeater	<i>Myzomela sanguinolenta</i>	1	0.14%
Striped Honeyeater	<i>Plectorhyncha lanceolata</i>	82	11.76%
Noisy Friarbird	<i>Philemon corniculatus</i>	11	1.58%
Little Friarbird	<i>Philemon citreogularis</i>	59	8.46%
Brown Honeyeater	<i>Lichmera indistincta</i>	163	23.39%
Blue-faced Honeyeater	<i>Entomyzon cyanotis</i>	105	15.06%
White-throated Honeyeater	<i>Melithreptus albobularis</i>	5	0.72%
Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>	1	0.14%
Lewin's Honeyeater	<i>Meliphaga lewinii</i>	56	8.03%
Mangrove Honeyeater	<i>Gavicalis fasciogularis</i>	140	20.09%
Noisy Miner	<i>Manorina melanocephala</i>	127	18.22%
Striated Pardalote	<i>Pardalotus striatus</i>	38	5.45%
Brown Gerygone	<i>Gerygone mouki</i>	1	0.14%
Fairy Gerygone	<i>Gerygone palpebrosa</i>	1	0.14%
White-throated Gerygone	<i>Gerygone olivacea</i>	4	0.57%
Mangrove Gerygone	<i>Gerygone levigaster</i>	131	18.79%
Large-billed Scrubwren	<i>Sericornis magnirostra</i>	1	0.14%
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>	32	4.59%
Brown Thornbill	<i>Acanthiza pusilla</i>	1	0.14%
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>	5	0.72%
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	140	20.09%
White-bellied Cuckoo-shrike	<i>Coracina papuensis</i>	1	0.14%
White-winged Triller	<i>Lalage tricolor</i>	1	0.14%
Variied Triller	<i>Lalage leucomela</i>	35	5.02%
Rufous Whistler	<i>Pachycephala rufiventris</i>	112	16.07%
Golden Whistler	<i>Pachycephala pectoralis</i>	3	0.43%
Little Shrike-thrush	<i>Colluricincla megarhyncha</i>	14	2.01%
Grey Shrike-thrush	<i>Colluricincla harmonica</i>	13	1.87%
Eastern Whipbird	<i>Psophodes olivaceus</i>	3	0.43%

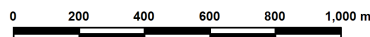
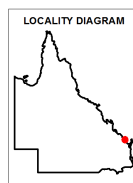
Australasian Figbird	<i>Sphecotheres vieilloti</i>	158	22.67%
Olive-backed Oriole	<i>Oriolus sagittatus</i>	47	6.74%
Pied Currawong	<i>Strepera graculina</i>	3	0.43%
Australian Magpie	<i>Gymnorhina tibicen</i>	194	27.83%
Pied Butcherbird	<i>Cracticus nigrogularis</i>	156	22.38%
Grey Butcherbird	<i>Cracticus torquatus</i>	44	6.31%
White-breasted Woodswallow	<i>Artamus leucorhynchus</i>	65	9.33%
Spangled Drongo	<i>Dicrurus bracteatus</i>	60	8.61%
Willie Wagtail	<i>Rhipidura leucophrys</i>	199	28.55%
Rufous Fantail	<i>Rhipidura rufifrons</i>	17	2.44%
Grey Fantail	<i>Rhipidura fuliginosa</i>	32	4.59%
Torresian Crow	<i>Corvus orru</i>	143	20.52%
Leaden Flycatcher	<i>Myiagra rubecula</i>	26	3.73%
Satin Flycatcher	<i>Myiagra cyanoleuca</i>	1	0.14%
Magpie-lark	<i>Grallina cyanoleuca</i>	192	27.55%
Black-faced Monarch	<i>Monarcha melanopsis</i>	1	0.14%
Eastern Yellow Robin	<i>Eopsaltria australis</i>	1	0.14%
Mistletoebird	<i>Dicaeum hirundinaceum</i>	110	15.78%
Nutmeg Mannikin	<i>Lonchura punctulata</i>	62	8.90%
Chestnut-breasted Mannikin	<i>Lonchura castaneothorax</i>	54	7.75%
Plum-headed Finch	<i>Neochmia modesta</i>	2	0.29%
Zebra Finch	<i>Taeniopygia guttata</i>	7	1.00%
Double-barred Finch	<i>Taeniopygia bichenovii</i>	92	13.20%
House Sparrow	<i>Passer domesticus</i>	46	6.60%
Australasian Pipit	<i>Anthus novaeseelandiae</i>	138	19.80%
Horsfield's Bushlark	<i>Mirafra javanica</i>	13	1.87%
Golden-headed Cisticola	<i>Cisticola exilis</i>	145	20.80%
Brown Songlark	<i>Cincloramphus cruralis</i>	24	3.44%
Rufous Songlark	<i>Cincloramphus mathewsi</i>	3	0.43%
Tawny Grassbird	<i>Cincloramphus timoriensis</i>	67	9.61%
Little Grassbird	<i>Poodytes gramineus</i>	3	0.43%
Australian Reed-Warbler	<i>Acrocephalus australis</i>	9	1.29%
Fairy Martin	<i>Petrochelidon ariel</i>	136	19.51%
Tree Martin	<i>Petrochelidon nigricans</i>	43	6.17%
Welcome Swallow	<i>Hirundo neoxena</i>	182	26.11%
Barn Swallow	<i>Hirundo rustica</i>	1	0.14%
Silvereye	<i>Zosterops lateralis</i>	62	8.90%
Common Starling	<i>Sturnus vulgaris</i>	27	3.87%
Common Myna	<i>Acridotheres tristis</i>	2	0.29%
Common Blackbird	<i>Turdus merula</i>	2	0.29%
Teal spp		1	0.14%
Crow & Raven spp		1	0.14%
Tattler spp		1	0.14%



Regulated Vegetation Management Map

Legend

-  Selected Lot and Plan
-  Category A area (Vegetation offsets/compliance notices/VDecs)
-  Category B area (Remnant vegetation)
-  Category C area (High-value regrowth vegetation)
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-  Water
-  Area not categorised
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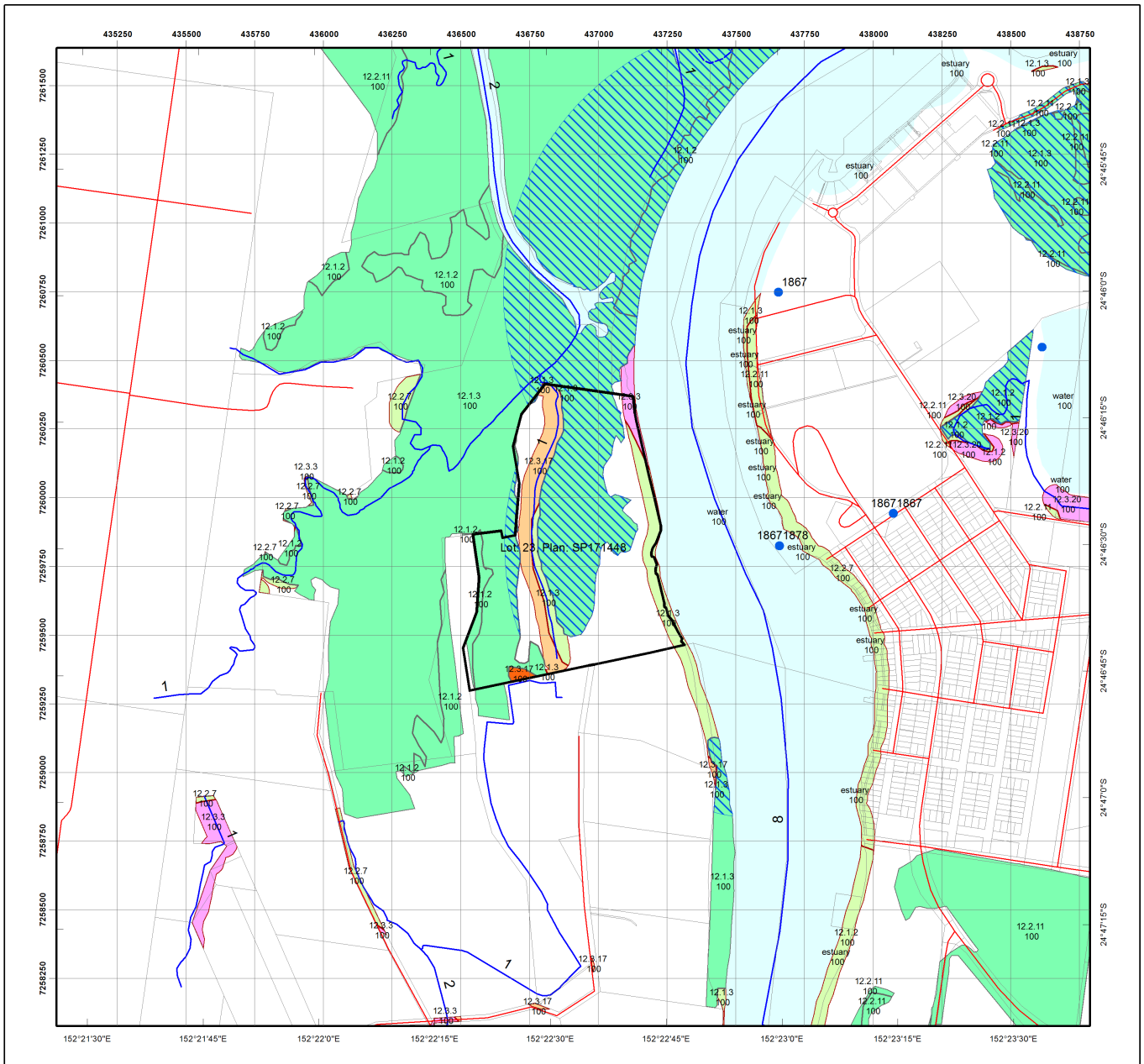
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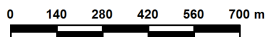




Vegetation Management Supporting Map

Legend

- Selected Lot and Plan
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category A or B area under Section 20AH
These areas are edged in yellow and filled with the remnant RE Status
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- Category C area under Section 20AI
These areas are edged in purple and filled with the remnant RE Status
- Category X area
- Water
- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
- Essential habitat species record
- Watercourses and drainage features on the vegetation management watercourse and drainage features map
(Stream order shown as black number against stream where available)
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- National Parks, State Forest and other reserves
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Vegetation Management Act 1999 - Extract from the essential habitat database

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- Accepted development vegetation clearing codes made under the *Vegetation Management Act 1999*

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This report identifies essential habitat in Category A, B and Category C areas.

The numeric labels on the essential habitat map can be cross referenced with the database below to determine which essential habitat factors might exist for a particular species.

Essential habitat is compiled from a combination of species habitat models and buffered species records.

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Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated.

Essential habitat, for protected wildlife, means a category A area, a category B area or category C area shown on the regulated vegetation management map-

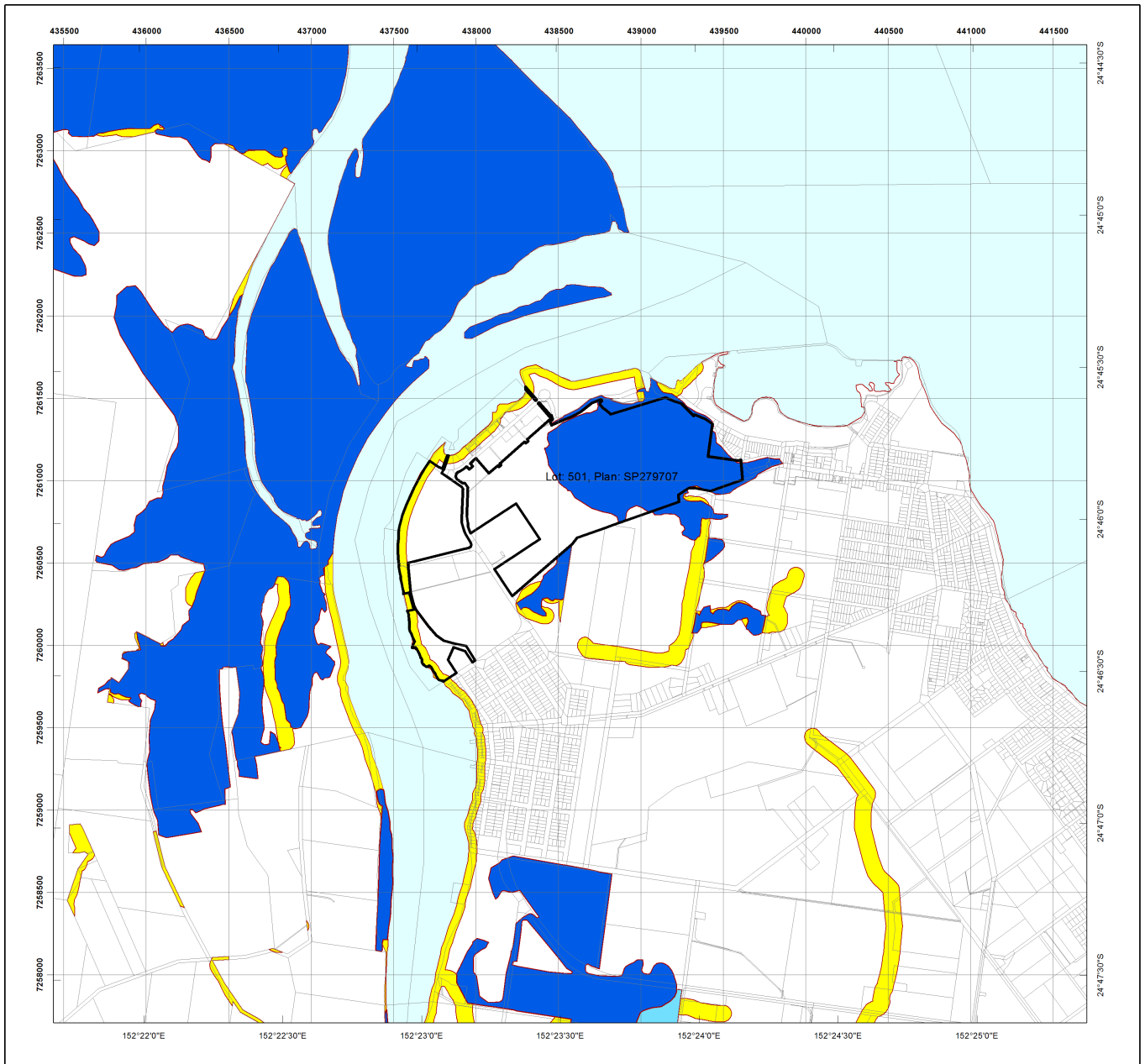
- 1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database; or
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Protected wildlife includes endangered, vulnerable or near-threatened native wildlife prescribed under the *Nature Conservation Act 1992*.

Essential habitat in Category A and/or Category B and/or Category C










Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
1867	<i>Limosa lapponica baueri</i>	bar-tailed godwit	V	Foraging on large intertidal mudflat/sandflat, banks in estuaries, inlets, bays and coastal lagoons; also saline wetlands, saltmarsh, sandy beach, rock platform and coral reef-flat. Roost on sandy beach/spit and near saltmarsh.	Sea level to 100m.	Sand and mud substrates.	Associated with coastlines and wetlands.
1878	<i>Calidris ferruginea</i>	curlew sandpiper	E	Foraging on intertidal mudflat in sheltered estuaries, bays, inlets and lagoons; non-tidal swamps and inland ephemeral and permanent lakes, dams or waterholes. Roost on shingle/sand/shell beaches, saltmarsh, mangrove and close to wetlands.	Sea level to 100m.	Sand and mud substrates.	Associated with coastlines and coastal and inland wetlands.

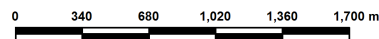
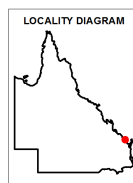
Label	Regional Ecosystem (mandatory unless otherwise specified)
1867	2.1.1, 2.1.4, 2.1.5, 3.1.6, 7.1.2, 7.1.3, 8.1.2, 8.1.3, 8.1.4, 11.1.1, 11.1.2, 11.1.3, 12.1.2, 12.1.3.
1878	2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.1.5, 3.1.6, 7.1.1, 7.1.2, 7.1.3, 8.1.1, 8.1.2, 8.1.3, 8.1.4, 11.1.1, 11.1.2, 11.1.3, 11.1.4, 12.1.2, 12.1.3.



Regulated Vegetation Management Map

Legend

-  Selected Lot and Plan
-  Category A area (Vegetation offsets/compliance notices/VDecs)
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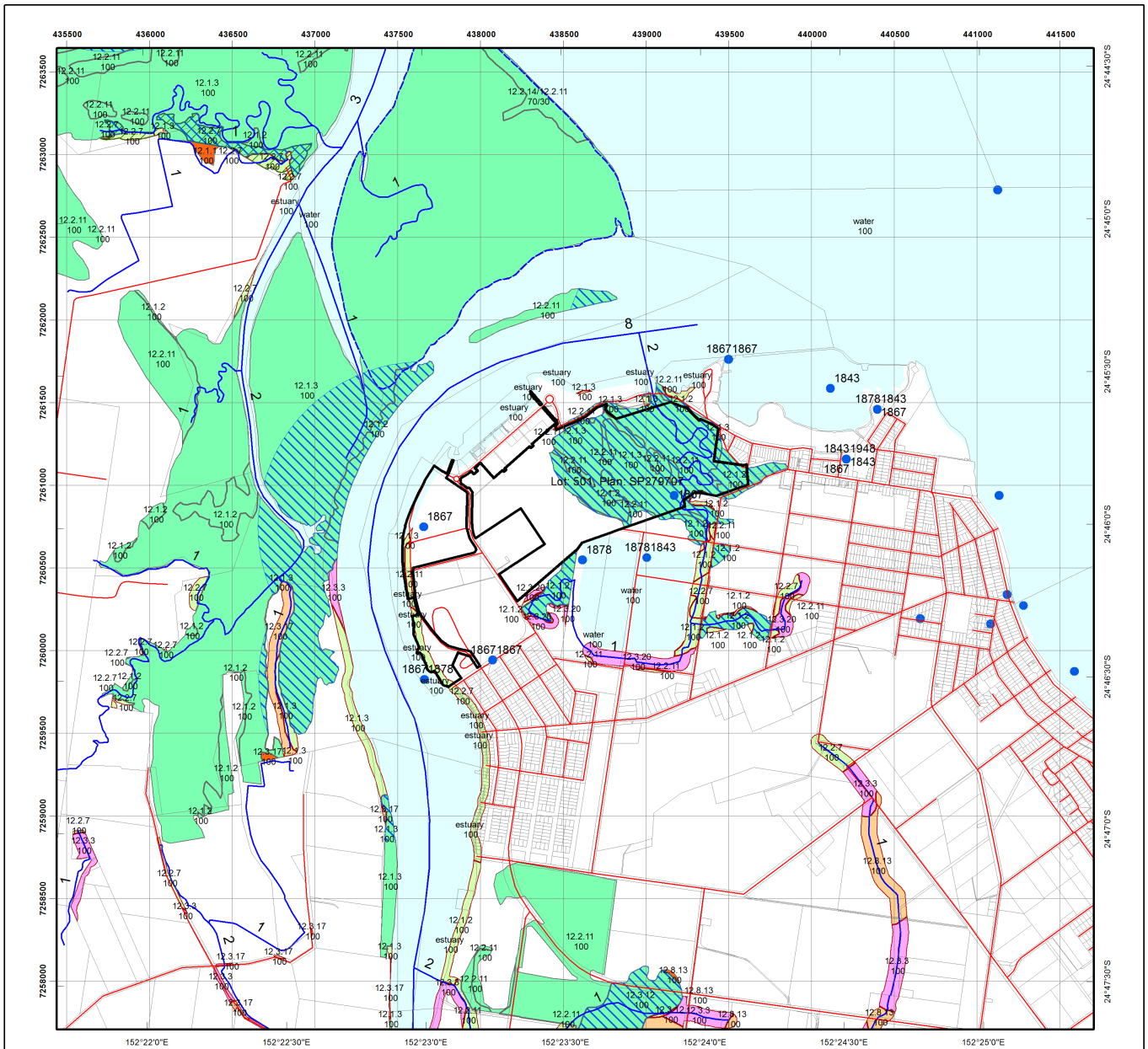
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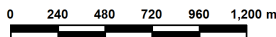




Vegetation Management Supporting Map

Legend

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- Category C area under Section 20AI
These areas are edged in purple and filled with the remnant RE Status
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- Water
- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
- Essential habitat species record
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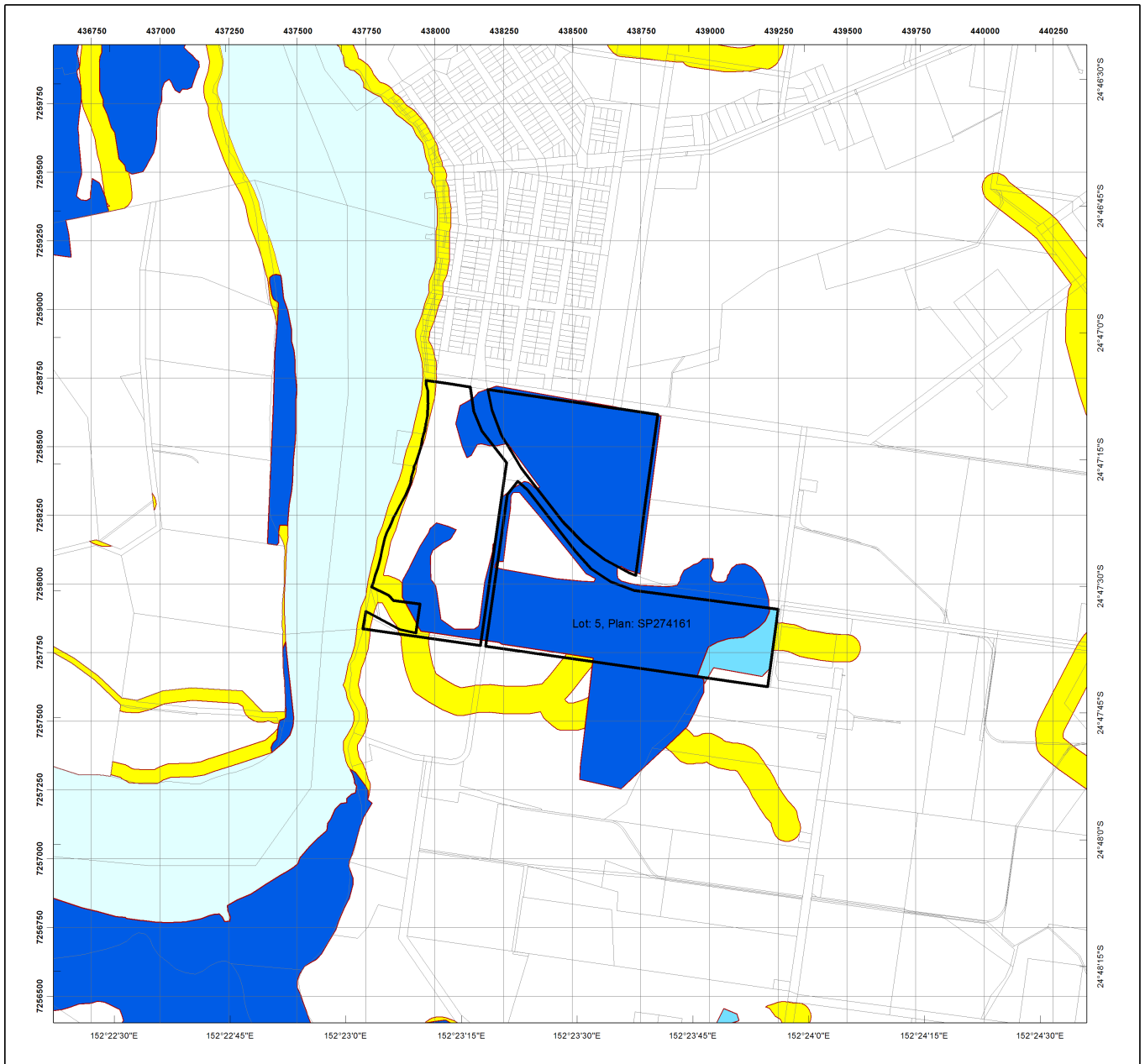
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Essential habitat in Category A and/or Category B and/or Category C










Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
1843	<i>Numenius madagascariensis</i>	eastern curlew	E	Foraging on soft, intertidal mudflat, with a preference for broad flats, often in sheltered areas near mangroves and estuaries/creeks, also on sandflats and occasionally ocean beaches, rock platforms and coral reefs. Roost on saltflat, saltmarsh, mangroves, reef flat, sandy spits and grassland near water.	Sea level to 100m.	Sand, sandy mud and mud substrates.	Associated with coastlines and wetlands.
1867	<i>Limosa lapponica baueri</i>	bar-tailed godwit	V	Foraging on large intertidal mudflat/sandflat, banks in estuaries, inlets, bays and coastal lagoons; also saline wetlands, saltmarsh, sandy beach, rock platform and coral reef-flat. Roost on sandy beach/spit and near saltmarsh.	Sea level to 100m.	Sand and mud substrates.	Associated with coastlines and wetlands.
1878	<i>Calidris ferruginea</i>	curlew sandpiper	E	Foraging on intertidal mudflat in sheltered estuaries, bays, inlets and lagoons; non-tidal swamps and inland ephemeral and permanent lakes, dams or waterholes. Roost on shingle/sand/shell beaches, saltmarsh, mangrove and close to wetlands.	Sea level to 100m.	Sand and mud substrates.	Associated with coastlines and coastal and inland wetlands.
1948	<i>Charadrius leschenaultii</i>	greater sand plover	V	Foraging on intertidal mudflats, sandbank, sandy/shelly/muddy beaches, rock platforms, coral reefs and tidal lagoons. Roost on sandspit, beach, lagoons edge, rocky points, coastal saltmarsh and claypan.	Sea level to 100m.	Sand and mud substrates.	Associated with coastlines and wetlands.

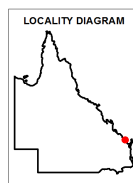
Label	Regional Ecosystem (mandatory unless otherwise specified)
1843	2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.1.5, 3.1.6, 7.1.1, 7.1.2, 7.1.3, 8.1.1, 8.1.2, 8.1.3, 8.1.4, 11.1.1, 11.1.2, 11.1.3, 11.1.4, 12.1.2, 12.1.3
1867	2.1.1, 2.1.4, 2.1.5, 3.1.6, 7.1.2, 7.1.3, 8.1.2, 8.1.3, 8.1.4, 11.1.1, 11.1.2, 11.1.3, 12.1.2, 12.1.3
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1948	2.1.1, 2.1.4, 2.1.5, 3.1.6, 7.1.2, 7.1.3, 8.1.2, 8.1.3, 8.1.4, 11.1.1, 11.1.2, 11.1.3, 12.1.2, 12.1.3



Regulated Vegetation Management Map

Legend

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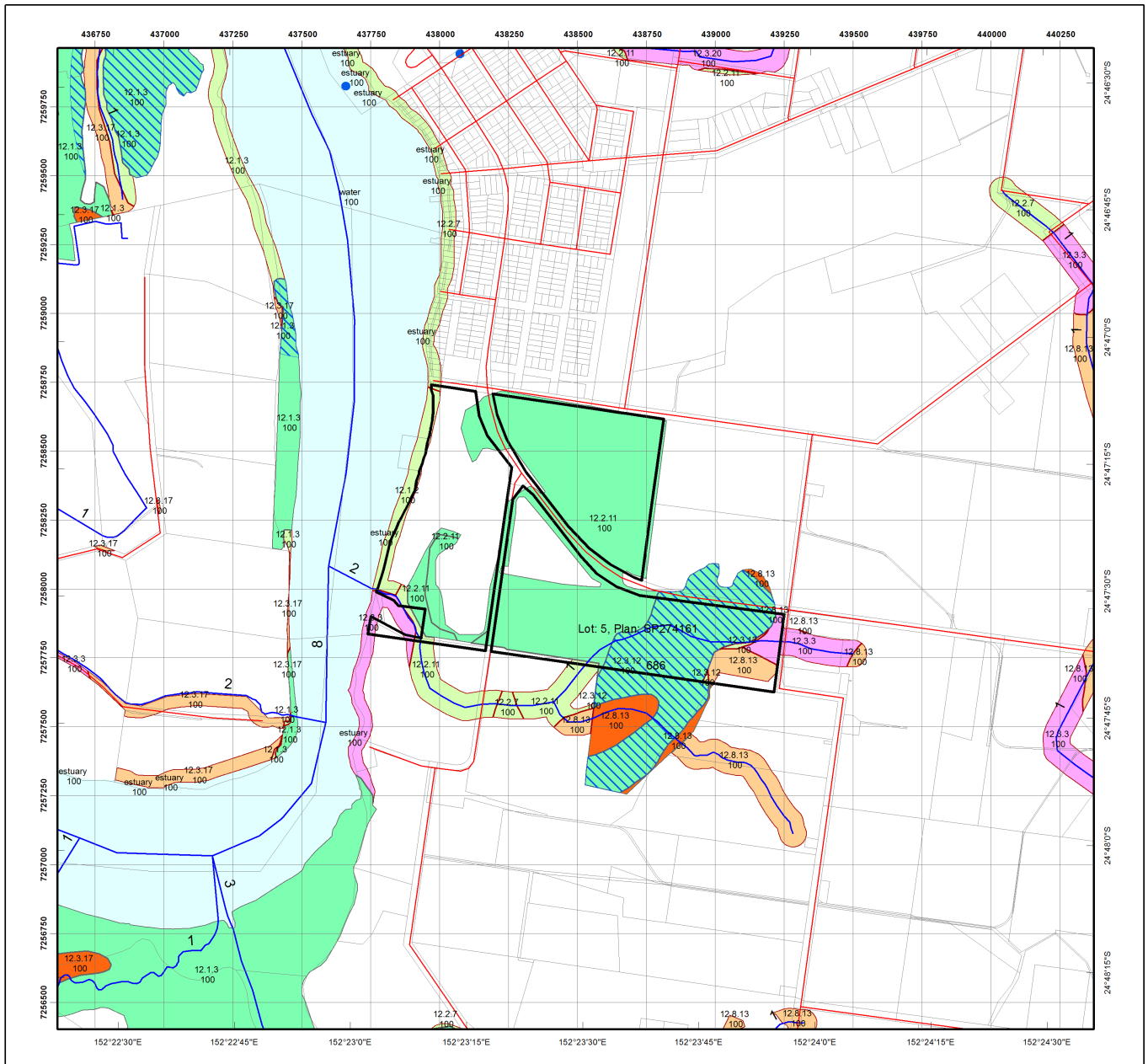
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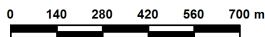




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Regional ecosystem line work has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Line work should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/- 100 metres.

Disclaimer:
 While every care is taken to ensure the accuracy of this product, the Department of Natural Resources, Mines and Energy makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

Additional information may be required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.dnrme.qld.gov.au or contact the Department of Natural Resources, Mines and Energy.

Digital data for the vegetation management watercourse and drainage feature map, vegetation management wetlands map, essential habitat map and the vegetation management remnant and regional ecosystem map are available from the Queensland Spatial Portal at <http://www.information.qld.gov.au/>

Land parcel boundaries are provided as locational aid only.



Vegetation Management Act 1999 - Extract from the essential habitat database

Essential habitat is required for assessment under the:

- State Development Assessment Provisions - State Code 16: Native vegetation clearing which sets out the matters of interest to the state for development assessment under the *Planning Act 2016*; and
- Accepted development vegetation clearing codes made under the *Vegetation Management Act 1999*

Essential habitat for one or more of the following species is found on and within 1.1 km of the identified subject lot/s on the accompanying essential habitat map.

This report identifies essential habitat in Category A, B and Category C areas.

The numeric labels on the essential habitat map can be cross referenced with the database below to determine which essential habitat factors might exist for a particular species.

Essential habitat is compiled from a combination of species habitat models and buffered species records.

The Department of Natural Resources, Mines and Energy website (<http://www.dnrme.qld.gov.au>) has more information on how the layer is applied under the State Development Assessment Provisions - State Code 16: Native vegetation clearing and the *Vegetation Management Act 1999*.

Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated.

Essential habitat, for protected wildlife, means a category A area, a category B area or category C area shown on the regulated vegetation management map-

- 1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database; or
- 2) in which the protected wildlife, at any stage of its life cycle, is located.

Protected wildlife includes endangered, vulnerable or near-threatened native wildlife prescribed under the *Nature Conservation Act 1992*.

Essential habitat in Category A and/or Category B and/or Category C

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
686	<i>Crinia tinnula</i>	wallum froglet	V	Vegetation community is a mandatory essential habitat factor for this species. Permanent to ephemeral acidic (pH 4.3 - 5.2), soft freshwater in Melaleuca (e.g. <i>M. quinquenervia</i>) swamps, sedgeland, wet and dry heathland (e.g. <i>Banksia robur</i> , <i>Xanthorrhoea</i>) and wallum (<i>Banksia aemula</i> shrubland/woodland) areas coastal lowlands on sand or sandstone, occasionally in adjacent open forest/woodland (e.g. <i>Eucalyptus racemosa</i> , <i>Corymbia citriodora</i>) with heathy understorey; known to persist in small remnants (<10ha); may be found well away from water.	Sea level to 150m.	Sandy and sandy-alluvial substrates.	None

Label	Regional Ecosystem (mandatory unless otherwise specified)
686	12.2.5, 12.2.7, 12.2.9, 12.2.10, 12.2.12, 12.2.15, 12.3.4, 12.3.5, 12.3.6, 12.3.12, 12.3.14, 12.3.20, 12.5.2, 12.5.10. These regional ecosystems are not a mandatory essential habitat factor for this species.