



# Australia

## Moreton Bay

### Offline RIS Word form

The purpose of this form is to help in collecting data on a Ramsar Site for the completion of an online Ramsar Information Sheet (RIS) at <https://rsis.ramsar.org>. It can be circulated between the National Focal Point, RIS compilers and other national data collectors. However, it is not accepted by the Ramsar Secretariat for submission of a Site update or new Site designation. The data collected through this form must be transferred to the online form by the National Focal Point or an authorized online RIS compiler.

All fields marked with an asterisk (\*) are required.

For more information on how to use this form, please refer to the document [How to use the offline RIS Word form.](#)

## Color codes

Fields back-shaded in **light blue** relate to data and information required only for RIS updates.

Note that some fields concerning aspects of Part 3, the Ecological Character Description of the RIS (**tinted in purple**), are not expected to be completed as part of a standard RIS, but are included for completeness so as to provide the requested consistency between the RIS and the format of a 'full' Ecological Character Description, as adopted in Resolution X.15 (2008). If a Contracting Party does have information available that is relevant to these fields (for example from a national format Ecological Character Description) it may, if it wishes to, include information in these additional fields.

## Summary

---

### 1.1 Summary description

*Please provide a short descriptive text summarising the key characteristics and internationally important aspects of the site. You may prefer to complete the four following sections before returning to draft this summary.*

**Summary** (This field is limited to 2500 characters)

The Moreton Bay Ramsar site is located in and around Moreton Bay, north-east, east and south-east of the city of Brisbane, in the state of Queensland, Australia. It is located approximately mid-way along the east coast of Australia at a latitude of between 27 and 28 degrees south.

The site is in a semi-enclosed basin, bounded on its eastern side by large sand islands and a deltaic coast on the western side, where large rivers discharge to the bay from a combined catchment of approximately 22,000 km<sup>2</sup>. The bay is approximately 110 km long from north to south and 35 km at its widest east to west axis.

The site meets all nine criteria for the designation of wetlands of international importance. It is notable for its large size, diversity of wetland habitats, connectivity between wetland types, as well as diverse flora and fauna that includes threatened species and ecological communities. It contains seagrass, sandy and muddy tidal flats and subtidal areas, saltmarsh, mangroves and coral communities, freshwater wetlands, as well as ocean beaches and dunes.

The site includes one of the most extensive intertidal areas of seagrass, mangrove and saltmarsh communities on the eastern coast of Australia, and is valuable for supporting fisheries resources, waterbirds and marine megafauna of conservation significance.

The site regularly supports more than 50,000 waterbirds, representing at least 43 species of shorebirds and at least 28 migratory shorebird species. The site is recognised as a network site under the East Asian-Australasian Flyway Partnership (site code EAAF013) and supports over 1% of the estimated flyway population of at least nine migratory shorebird species, including the eastern curlew (*Numenius madagascariensis*) and curlew sandpiper (*Calidris ferruginea*), which are critically endangered under national environmental legislation.

The site further supports a range of internationally, nationally, state and locally significant species including the Oxleyan pygmy perch (*Nannoperca oxleyana*) fish, four species of acid frogs, the water mouse (*Xeromys myoides*), Illidge's ant-blue butterfly (*Acrodipsas illidgei*), and several freshwater invertebrates.

In addition to its environmental values, the site provides important cultural, social, economic and recreational values. See section 6.1.2 vi for additional information.

## Data & location

### 2.1 Formal data

#### 2.1.1 Name and address of the compiler of this RIS

##### Compiler 1

Name

Manager, Wetlands Team

Institution/agency

Department of Environment and Science, Queensland

Postal address (This field is limited to 254 characters)

GPO Box 2454, Brisbane, Queensland, 4001, Australia

E-mail (The online RIS only accepts valid e-mail addresses, e.g. example@mail.com )

info@des.qld.gov.au

Phone (The online RIS only accepts valid phone numbers, e.g. +1 41 123 45 67 )

+61 13 74 68

Fax (The online RIS only accepts valid phone numbers, e.g. +1 41 123 45 67 )

##### Compiler 2

Name

Not applicable

Institution/agency

Not applicable

Postal address (This field is limited to 254 characters)

Not applicable

E-mail (The online RIS only accepts valid e-mail addresses, e.g. example@mail.com )

Phone (The online RIS only accepts valid phone numbers, e.g. +1 41 123 45 67 )

Fax (The online RIS only accepts valid phone numbers, e.g. +1 41 123 45 67 )

#### 2.1.2 Period of collection of data and information used to compile the RIS

From year (The online RIS only accepts numeric values)

1999

To year (The online RIS only accepts numeric values)

2018

#### 2.1.3 Name of the Ramsar Site

Official name (in English, French or Spanish)\* (This field is mandatory)

Moreton Bay

Unofficial name (optional)

Not applicable

#### 2.1.4 Changes to the boundaries and area of the Site since its designation or earlier update

A. Changes to Site boundary (Update)

☒ Yes / ☐ No

- ☒ The boundary has been delineated more accurately  
☐ The boundary has been extended  
☐ The boundary has been restricted

B. Changes to Site area (Update)

the area has increased<sup>1</sup>

- ☒ The Site area has been calculated more accurately  
☐ The Site has been delineated more accurately  
☐ The Site area has increased because of a boundary extension  
☐ The Site area has decreased because of a boundary restriction

*Important note: If the boundary of the designated site is being restricted/reduced, before submitting this updated RIS to the Secretariat the Contracting Party should have followed: - the requirements in Article 2.5 of the Convention; or - the procedures established by the Conference of the Parties in the annex to Resolution VIII.20 (2002); or - where appropriate instead, the procedures in the annex to Resolution IX.6 (2005). Contracting Parties should also have provided to the Secretariat a report on changes prior to the submission of an updated RIS.*

## 2.1.5 Changes to the ecological character of the Site

6b i. Has the ecological character of the Ramsar Site (including applicable Criteria) changed since the previous RIS? (Update)

No<sup>2</sup>

Are the changes (Update)

☐ Positive / ☐ Negative / ☒ Positive & Negative

What extent of the Ramsar site is affected (%)

Positive % (Update)

Negative % (Update)

Optional text box to provide further information (Update)

Not applicable

☐ No information available

Are changes the result of (tick each category which applies):

- ☐ Changes resulting from causes operating within the existing boundaries?  
☐ Changes resulting from causes operating beyond the site's boundaries?  
☐ Changes consequent upon site boundary reduction alone (e.g., the exclusion of some wetland types formerly included within the site)?  
☐ Changes consequent upon site boundary increase alone (e.g., the inclusion of different wetland types in the site)?

Please describe any changes to the ecological character of the Ramsar Site, including in the application of the Criteria, since the previous RIS for the site. (Update)

Is the change in ecological character negative, human-induced AND a significant change (above the limit of acceptable change) (Update)

☐ Yes / ☒ No

Has an Article 3.2 report been submitted to the Secretariat? (Update)

☐ Yes / ☒ No

<sup>1</sup> No change to area | the area has increased | the area has decreased

<sup>2</sup> Not evaluated | No | Uncertain | Yes -likely- | Yes -actual-

## 2.2 Site location

### 2.2.1 Defining the Site boundaries

The site boundaries must be clearly delineated on both: a) a GIS shapefile and b) a digital map/image:

-> To define the site boundaries please complete field 2.2.1 a1), 2.2.1 a2) and 2.2.1 b) via the online form.

**-UPLOAD via online form-**

Boundaries description (This field is limited to 2500 characters)

See section 6.1.2 vi for a comprehensive boundary description for the site.

The Moreton Bay Ramsar site is located in and around Moreton Bay and near the city of Brisbane, in south east Queensland. It extends approximately 110 km from Bribie Island in the north to the northern wall of the Gold Coast Seaway in the south, and is 35 km at its widest east to west axis.

The site includes one of the largest, hydrologically diverse estuarine bays in Australia and is semi-enclosed by large sand island barriers. The site includes most of Moreton Island, and parts of North and South Stradbroke Islands, Bribie Island, the southern Bay Islands, waters and tributaries of Pumicestone Passage, some intertidal and subtidal areas of the western Bay, southern Bay, estuarine and sandy channels of the Broadwater region, marine areas and sand banks within the central and northern Bay, and some ocean beach habitats.

Given the size and diversity of the Ramsar site, the site has been further delineated into four areas for the purposes of its boundary description:

- Area 1 – Bribie Island, Pumicestone Passage, Deception Bay and Caboolture River
- Area 2 – Western Bay (Redcliffe to Cleveland)
- Area 3 – Moreton Island and Eastern Banks
- Area 4 – Stradbroke Islands and Southern Bay

### 2.2.2 General location

a) In which large administrative region does the site lie?

Queensland

b) What is the nearest town or population centre?

The nearest major city is Brisbane, the capital city of Queensland, which has a population of 2,055,000 based on the Australian Bureau of Statistics 2016 census

### 2.2.3 For wetlands on national boundaries only

a) Does the wetland extend onto the territory of one or more other countries?

☐ Yes / ☒ No

b) Is the site adjacent to another designated Ramsar Site on the territory of another Contracting Party?

☐ Yes / ☒ No

c) Is the site part of a formal transboundary designation with another Contracting Party?

☐ Yes / ☒ No

d) Transboundary Ramsar Site name:

### 2.2.4 Area of the Site

If you have not established an official area by other means, you can copy the area calculated from the GIS boundaries into the 'official area' box.

Official area, in hectares (ha): (The online RIS only accepts numeric values)

120654

Area, in hectares (ha) as calculated from GIS boundaries

120654.44

## 2.2.5 Biogeography

*Please provide the biogeographic region(s) encompassing the site and the biogeographic regionalization scheme applied:*

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Udvardy's Biogeographical Provinces	6.1.1 Australian Realm, Queensland Coastal
Bailey's Ecoregions	Province- Oceanic Mixed Constantly Humid Forests (44)
WWF Terrestrial Ecoregions	Temperate Broadleaf and Mixed Forests - Eastern Australian Temperate Forests (terrestrial) (code AA0402) (WWF)
Other scheme (provide name below)	Australian Hydrological Geospatial Fabric – Topographic Drainage Divisions and River Regions; regions listed below.
Marine Ecoregions of the World (MEOW)	Temperate Australasia; East Central Australian Shelf (55), Tweed-Moreton (202)
Freshwater Ecoregions of the World (FEOW)	Eastern Coastal Australia (807) (FEOW)

Other biogeographic regionalisation scheme (This field is limited to 2500 characters)

- Australian Drainage Division - North East Coast Drainage Division (NEC) (BOM 2012)
  - Interim Biogeographic Regionalisation for Australia version 7 (IBRA7) – Terrestrial:
    - South Eastern Queensland; Moreton Basin (SEQ02) biogeographic region
    - Commonwealth of Australia 2012- <http://www.environment.gov.au/land/nrs/science/ibra>
  - Interim Marine and Coastal Regionalisation for Australia (IMCRA version 4 June 2006)
    - Provincial-scale bioregion – Central Eastern
- Meso-scale marine bioregion –Tweed-Moreton (Commonwealth of Australia 2006-  
<http://www.environment.gov.au/resource/guide-integrated-marine-and-coastal-regionalisation-australia-version-40-june-2006-imcra>)
- Australian Hydrological Geospatial Fabric – Topographic Drainage Divisions and River Regions:
    - Maroochy River (41)

- Pine River (42)
- Brisbane River (43)
- Stradbroke Island (44)
- Logan–Albert Rivers (45)
- South Coast (46) (BOM 2012 - <http://www.bom.gov.au/water/about/riverBasinAuxNav.shtml>)

## Why is the Site important?

### 3.1 Ramsar Criteria and their justification

*Tick the box against each criterion applied to the designation of the Ramsar Site. All criteria which apply should be ticked. Please explain why you selected a criterion by filling in the relevant fields on this page, on the three other pages of this section 'Criteria & justification' and on the 'Wetland types' page of the section 'What is the site like?'.*

#### ☒ Criterion 1: Representative, rare or unique natural or near-natural wetland types

*To justify this Criterion, please select at least one wetland type as representative, rare or unique in the section What is the site like? > Wetland types and provide further details in at least one of the three boxes below.*

##### Hydrological services provided (This field is limited to 3000 characters)

The Moreton Bay Ramsar site is representative of sub-tropical coastal wetland systems of the Moreton Basin biogeographic region of south eastern Queensland, and the Tweed-Moreton marine meso-scale bioregion of the Interim Marine and Coastal Regionalisation of Australia (IMCRA) (Commonwealth of Australia 2006). The subtropical climate is characterised by high summer rainfall that can result in large runoff events and floods. This seasonal, event-driven hydrology can lead to shifts between two distinct hydrological modes: wind, wave and tidally dominated; and freshwater inflow dominated (Gibbes et al. 2014).

The site is part of a functioning major coastal system and contains a diversity of wetland habitat types with a high degree of connectivity between many of these habitats. The wetlands are subject to sedimentation, accretion and erosion, and hydrodynamic controls such as tidal inundation, freshwater flows and groundwater interaction. These physical processes interact with chemical and biogeochemical processes, such as nutrient and carbon cycling that, in turn, influences biological processes, such as primary production, reproduction, recruitment and species interaction (BMT WBM 2008).

The site includes natural and near-natural freshwater wetlands and critical habitats such as peat swamps, clay pans, window water-table lakes, perched lakes, freshwater creeks and other groundwater dependent ecosystems (DES 2015). The hydrology of these wetlands is influenced by rainfall recharge, evaporation, sub-surface infiltration, groundwater flows and, for some creeks and lakes, the surface expression of groundwater (BMT WBM 2008). Significant variation among fish and crustacean species exists at small scales; for example, intraspecific genetic divergence has been identified in populations of freshwater fish and crustacea that have been long separated by a barrier to genetic exchange provided by the high central dunes of North Stradbroke Island (Page et al. 2012).

The site includes coastal heath referred to as 'wallum'. Habitats associated with wallum comprise permanent and ephemeral streams, lagoons and lakes and wet heath communities dominated by sedges and shrubs (Marshall et al. 2011). These are characterised by low nutrient siliceous sand soils, low pH and a supply of moisture from shallow groundwater sources (Leiper et al. 2008). These systems contain uncommon biota with highly restricted distributions that are adapted to acidic waters (Marshall et al. 2011).

Moreton Bay is subject to a large submarine groundwater discharge (SGD) rate estimated to be approximately 18 times greater than the average annual discharge of all the major river inputs into the Bay (Stewart et al. 2015). The SGD has been suggested as a major component of the hydrological and biogeochemical cycles of Moreton Bay and has a major influence on the export of alkalinity and dissolved carbon into the Bay. See section 6.1.2 vi for additional information.

##### Other ecosystem services provided (This field is limited to 3000 characters)

Ecosystem services refer to the goods and services provided by ecosystems that benefit, sustain and support the environmental, social and economic wellbeing of people. These include provisioning services, such as food and water; regulating services, such as regulation of floods, drought, land degradation, and disease; supporting services, such as soil formation, provisioning of habitat and nutrient cycling; and cultural services, such as recreational, spiritual, religious, and other non-material benefits (Millennium Ecosystem Assessment 2005).

Moreton Bay provides numerous services to locals and visitors to south east Queensland. Services, these include: tourism and recreational opportunities; fishery products; aesthetic benefits; health and wellbeing; cultural services; storm surge mitigation; climate regulation through carbon sequestration and local temperature moderation and treatment of pollutants (e.g. denitrification processes).



Moreton Bay mangroves and saltmarsh communities provide important primary production for a range of species, including commercially valuable fish and crab species. The region supports one of the most productive fisheries in Queensland. Although the Bay only represents about 3% of Queensland's coastline, it produces just over 15% of the seafood for Queensland managed fisheries. The total value of commercial fishery production in the Bay is estimated to be \$24-30m (McPhee et al. 2008).

Moreton Bay's proximity to a major population centre makes it a very popular recreational fishing area. Estimates of the total expenditure by recreational fishers in Moreton Bay range from \$156m to \$194m per year (Pascoe et al. 2014).

In addition to fishing, Moreton Bay provides a range of recreational opportunities, including: sailing, motorboating, kayaking, swimming and kite surfing. A study from 1982 estimated the value of recreational boating to be \$1.7m per year (Rolfe et al. 2005). These recreational opportunities also provide significant health and wellbeing benefits to the broader community through the reduction in the cost of health care services.

Cultural services identified as being significant in the context of the Ramsar site include the importance of the site to Traditional Owners. The site provides spiritual and aesthetic services, improving human wellbeing. The site is also used extensively for research and education.

Wetlands within the site assist in buffering against coastal erosion, storm surges and flooding, which helps build resilience to flood and cyclone events (Barbier 2016). They can help maintain or improve water quality by transforming and retaining nutrients and sediment from run-off.

There are a range of natural and near-natural wetland types that provide supporting habitat for biodiversity within the Ramsar site. Please note there is a more expansive account of these fields under 'Additional material', See section 6.1.2 vi for additional information.

**Other reasons** (This field is limited to 3000 characters)

Detailed mapping and classification of wetlands within the region has been undertaken using a combination of Queensland Wetland Mapping (Version 4) (EPA 2005) and Moreton Bay broadscale habitats 2008 and Regional ecosystem mapping (version 10). When compared to the Ramsar habitat classification, it is clear that the Moreton Bay Ramsar site contains a wide diversity of Ramsar wetland types (with up to 23 types (one human-made)), including several that are considered rare within the bioregion. Refer Criterion 2: Rare species and threatened ecological communities; Criterion 3: Biological diversity (flora); section 3.2; section 3.4 and section 4.2 of this document.

**[x] Criterion 2 : Rare species and threatened ecological communities**

To justify this Criterion, please give details below on:

- relevant plant species in the section Criteria & justification> Plant species (3.2)
- relevant animal species in the section Criteria & justification> Animal species (3.3)
- relevant ecological communities in the section Criteria & justification> Ecological communities (3.4)

**Optional text box to provide further information** (This field is limited to 3000 characters)

The Moreton Bay Ramsar site supports a high diversity of nationally and internationally threatened flora and fauna species, and ecological communities. At least four Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (nationally) listed plant species have been recorded, including the endangered swamp daisy (*Olearia hygrophila*), and two endangered swamp orchid species (*Phaius australis* and *Phaius bernaysii*), which are frequently encountered on the bay islands but rarely on the mainland; as well as the vulnerable stinking cryptocarya (*Cryptocarya foetida*).

The Moreton Bay Ramsar site has a high diversity and abundance of waterbird species. This includes migratory shorebirds listed as threatened under the national Environment Protection and Biodiversity Conservation Act, such as the critically endangered eastern curlew (*Numenius madagascariensis*), curlew sandpiper (*Calidris ferruginea*) and great knot (*Calidris tenuirostris*), the endangered red knot (*Calidris canutus*) and lesser sand plover (*Charadrius mongolus*), as well as the vulnerable bar-tailed godwit (*Limosa lapponica*) and greater sand plover (*Charadrius leschenaultii*). The site supports the Environment Protection and Biodiversity Conservation Act 1999 listed marine turtles, including hawksbill (*Eretmochelys imbricata*), leatherback (*Dermochelys coriacea*), olive ridley (*Lepidochelys olivacea*), loggerhead (*Caretta caretta*), green (*Chelonia mydas*) and flatback (*Natator depressus*) (Limpus et al. 2006). It supports a number of iconic and nationally significant marine species, including the humpback whale (*Megaptera novaeangliae*). It also marks

the most southerly feeding and breeding grounds for dugongs (*Dugong dugon*) (Sobczick et al. 2017). Moreton Bay features the most southerly resident population of the threatened Australian humpback dolphin (*Sousa sahulensis*) and an important population of Indo-Pacific bottlenose dolphins (*Tursiops aduncus*).

The wallum wetland habitats of Moreton Bay support nationally endangered fish species, the Oxleyan pygmy perch (*Nannoperca oxleyana*), as well as four acid frog species (*Crinia tinnula*, *Litoria alongburensis*, *Litoria cooloolensis* and *Litoria freycineti*). The site further supports the internationally vulnerable water mouse (*Xeromys myoides*), the endangered swamp crayfish (*Tenuibranchiurus glypticus*) and endangered Illidge's ant-blue butterfly (*Acrodipsas illidgei*).

The site contains the following threatened ecological communities:

- Subtropical and Temperate Coastal Saltmarsh - under national Environment Protection and Biodiversity Conservation (EPBC) Act 1999 – Vulnerable
- Lowland Rainforest of Subtropical Australia - EPBC Act 1999 – Critically endangered
- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland - EPBC Act 1999 – Endangered
- Littoral Rainforest and Coastal Vine Thickets of Eastern Australia - EPBC Act 1999 – Critically endangered

### **[x] Criterion 3 : Biological diversity**

To justify this Criterion, please give details in the box below. If you want to name any specific species, please give details on:

- relevant plant species in the section Criteria & justification> Plant species (3.2)

- relevant animal species in the section Criteria & justification> Animal species (3.3)

**Justification** (This field is limited to 3000 characters)

High levels of biodiversity are supported by the diversity and scale of habitat types found within the site, which encompass both nutrient-rich inshore components (made up of intertidal estuarine habitats) and more oligotrophic offshore components (made up of sandy beaches, channels, banks and bars), as well as a range of other habitats, including freshwater systems.

Moreton Bay is a meeting point for tropical northern and temperate southern faunas which, combined with the diversity of habitats, has resulted in a high faunal diversity (Davie and Hooper in Tibbetts et al 1998; Hines and Meyer 2011). Numerous species within vertebrate groups including frogs (19) (Hines and Meyer 2011), reptiles (82), birds (410) and mammals (72) (Queensland Government DES 2018) have been recorded within the Ramsar site. The Ramsar site supports over 33,000 migratory shorebirds. A high diversity of marine mammals occurs within Moreton Bay; a total of 14 species of marine mammals are resident or visitors, including eight species of dolphin (two resident), five species of whale and the dugong. All six marine turtle species known to occur in Australian waters have been recorded in Moreton Bay (Limpus et al. 2006).

Over 3,000 species of marine invertebrates and approximately 750 fish species have been recorded in the bay (Davie and Hooper 1998; Johnson 1999). Sixty-four scleractinian coral species from 26 genera and 13 families have been recorded in the inner bay area and 125 species from 35 genera in the outer bay area (Wallace et al. 2009). The heath shadeskink (*Saproscincus orarius*) occurs within the Ramsar site, it is known in Queensland only from North Stradbroke Island (Hines, Meyer and Hethrington 2015).

The site supports diverse flora. For example, the Queensland Herbarium (2005) has recorded 824 native plant species at North Stradbroke Island alone, illustrating the high level of diversity in a regional context. Some flora species are thought to be restricted to the site and, therefore, contribute significantly to the bioregional biodiversity. The site includes ten regional ecosystems that have a state-based biodiversity status of 'endangered', covering over 363 hectares within the site. It also includes 15 regional ecosystems that have an 'of concern' status covering over 13,126 hectares. The biodiversity status of these ecosystems reflects their condition and clearing at a bioregional scale. As a whole, Moreton Bay supports approximately 275 species of macroalgae, which represents approximately 40% of the macroalgae species reported in Queensland (Phillips 1998 in Tibbetts et al. 1998). Several other flora communities within the Moreton Bay Ramsar site are particularly noteworthy. These include saltmarsh, seagrass and mangrove ecosystems, as well as wallum heathland. See section 6.1.2 vi for additional information.

### **[x] Criterion 4 : Support during critical life cycle stage or in adverse conditions**

To justify this Criterion, please give details below on:

- relevant plant species in the section Criteria & justification> Plant species (3.2)

- relevant animal species in the section Criteria & justification> Animal species (3.3)

and explain the life cycle stage or nature of adverse conditions in the accompanying 'justification' box.

**Optional text box to provide further information** (This field is limited to 3000 characters)

The Moreton Bay Ramsar site supports habitats that are important at critical stages in the life cycles of numerous wetland-dependent species, including at least 28 migratory shorebirds of the East Asian-Australasian Flyway. Each summer, more than 33,000 migratory shorebirds spend the non-breeding season (approx. Nov-Mar), and parts of their northward and southward migratory journeys in Moreton Bay. In addition, a subset of the non-breeding population, typically sub-adult birds not yet ready to reproduce, will remain in Moreton Bay year-round before making their first northward migration to the breed, this includes the nationally critically endangered eastern curlew. While in Moreton Bay, shorebirds feed twice daily on benthic invertebrates in exposed intertidal habitats. At high tide, when intertidal foraging areas are submerged, shorebirds congregate in high densities ('roosts') in supratidal habitats in or along the periphery of the Ramsar site, including claypans, sandy and rocky foreshores, and mangroves (coastal and islands) (Zharikov and Milton 2009).

Due to its internationally recognised importance for migratory waterbirds, Moreton Bay is listed as a Flyway network site of the East Asian Australasian Flyway Partnership (site code EAAF013). In addition to migratory shorebirds, the site supports a range of other waterbird species (QWSG 2017). The site provides important breeding habitat for the resident Australian pied oystercatcher (*Haematopus longirostris*), beach stone-curlew (*Esacus magnirostris*) and Little tern (*Sterna albigrons*), as well as raptors, such as the eastern osprey (*Pandion haliaetus*) and white bellied sea eagle (*Haliaeetus leucogaster*).

The site also provides important nursery grounds for a range of marine fish, prawns and crabs, as well as supporting the entire life cycle of acid frog species, the water mouse (*Xeromys myoides*), Illidge's ant blue butterfly (*Acrodipsas illidgei*) and the Oxleyan pygmy perch (*Nannoperca oxleyana*), a freshwater fish.

The site is also an important feeding area for green (*Chelonia mydas*) and loggerhead (*Caretta caretta*) turtles, and provides some areas suitable for nesting for both species (O'Connor et al. 2017). The site is an important feeding and breeding area for a population of dugongs (Lanyon 2003; Seddon et al. 2014; Sobotzick et al. 2015; Sobotzick et al. 2017) and provides habitat features for migratory species including the grey nurse shark (*Carcharias taurus*) and zebra shark (*Stegostoma fasciatum*). Both these species use mating sites in large aggregations during the warmer summer months near to the site (Dudgeon et al. 2013; Smith et al. 2015).

See section 6.1.2 vi for additional information.

**[X] Criterion 5 : >20,000 waterbirds**

To justify this Criterion, please give details below on:- the total number of waterbirds and the period of data collection - relevant waterbird species, and if possible their population size, in the section Criteria & justification> Animal species (3.3)

**Overall waterbird numbers\*** (This field is mandatory)

66,340

**Start year\*** (This field is mandatory)

2013

**End year\*** (This field is mandatory)

2017

**Source of data:**

QWSG 2017; Hansen et al. 2016

**Optional text box to provide further information** (This field is limited to 3000 characters)

Despite significant declines of several migratory shorebird species in Moreton Bay (Wilson et al. 2011), the area is estimated to continue to support more than 33,000 individuals of at least 28 species (Hansen et al. 2016 and refer to Section 6.1.2 - for additional information). Migratory shorebirds are a subset of 'waterbirds', which also includes other wetland bird species such as ducks, pelicans, cormorants, darters, herons, bitterns, storks, ibises and spoonbills. Monthly counts of migratory and non-migratory shorebirds, as well as other waterbirds, at no fewer than 40 high tide roost sites, have been undertaken by the Queensland Wader Study Group (QWSG) since 1992 (further detail can be found in Wilson et al. 2011).

Category	Species	Estimated population (2013-2017)
Migratory shorebirds	28	33,929
Non migratory shorebirds	15	3,758
Other waterbirds	59	28,653

**[x] Criterion 6 : >1% waterbird population**

To justify this Criterion, please give details on relevant waterbird species and their population size in the section Criteria & justification> Animal species (3.3)

Optional text box to provide further information (This field is limited to 3000 characters)

Based on the Hansen et al. 2016 revised East Asian-Australasian Flyway population estimates, the site provides habitat for >1% of the estimated East Asian-Australasian Flyway population of the following species:

- bar-tailed godwit (*Limosa lapponica*)
- curlew sandpiper (*Calidris ferruginea*)
- eastern curlew (*Numenius madagascariensis*)
- grey-tailed tattler (*Heteroscelus brevipes*)
- red-necked stint (*Calidris ruficollis*)
- Australian pied oystercatcher (*Haematopus longirostris*)\*
- whimbrel (*Numenius phaeopus*)
- sharp-tailed sandpiper (*Calidris acuminata*)
- lesser sand plover (*Charadrius mongolus*)
- double-banded plover (*Charadrius bicinctus*)

\*As Australian pied oystercatcher (*Haematopus longirostris*) is not a migratory shorebird, there is no Hansen et al. 2016 population estimates for the species. Instead the Waterbird Population Estimates (WPE) ([wpe.wetlands.org](http://wpe.wetlands.org)) has been used to determine the 1% threshold for this species.

Bar-tailed godwit (*Limosa lapponica*), curlew sandpiper (*Calidris ferruginea*), eastern curlew (*Numenius madagascariensis*) and lesser sand plover (*Charadrius mongolus*) have been undergoing significant declines, which is reflected in their national conservation status of vulnerable for bar-tailed godwit, critically endangered for eastern curlew and curlew sandpiper, and endangered for the lesser sand plover.

The QWSG surveys (refer Criterion 5 above) include counts at high tide at the Port of Brisbane located adjacent to the Ramsar site. These shorebird species are likely to be foraging in the surrounding area, including the Ramsar site. Red-necked stint (*Calidris ruficollis*) are one species that might forage within the Port of Brisbane in higher numbers, meaning estimates may be inflated for this species when considering the extent of the Ramsar site.

**[x] Criterion 7 : Significant and representative fish**

To justify this Criterion, please give information in the box below and details of relevant fish species in the section Criteria & justification> Animal species (3.3)

Justification (This field is limited to 3000 characters)

The Moreton Bay Ramsar site supports diverse fish fauna due to the wide variety of habitats within and adjacent to it, including mangroves, saltmarsh, seagrass, sand and mud flats, offshore channels, reef environments, estuarine creeks, freshwater lakes and streams (Laegdsgaard and Johnson 1995; Morton et al. 1997; Davie and Hooper 1998; Pusey et al. 2004; Johnson 1999; 2010; Olds et al. 2012).

For fish in the waters of Moreton Bay, two interacting zones of diversity exist; an inshore estuarine-dominated system and an eastern marine- dominated system (Davie and Hooper 1998 in Tibbets et al. 1998). Moreton Bay is also a meeting point for tropical northern and temperate southern faunas which, combined with the diversity of habitats, has resulted in the high faunal diversity, with approximately 750 fish species recorded in the Bay (Johnson 1999, Johnson 2010). In addition, there are at least 27 species of fish that are only known to occur in Moreton Bay (Davie and Hooper 1998 in Tibbets et al. 1998).

The diverse fish fauna of the Bay has cultural, social, and economic value (Johnson 2010). The estimated gross value of production for commercial fisheries in the Bay are in the range of AUD\$24m-\$30m (McPhee et al. 2008) and the recreational fisheries are valued at AUD\$20m per year (Pascoe et al. 2014). The major fish species targeted for commercial fisheries include yellowfin bream (*Acanthopagrus australis*) and sea mullet (*Mugil cephalus*) (van de Geer et al. 2013; Gilby et al. 2017), as well as (but not limited to) other species of mullet, bream, whiting, tailor, spinefoot (rabbitfish), garfish, baitfish, flathead, dart, snapper and trevally (QFish 2018). Popular species for recreational fisheries include, amongst others, sand whiting (*Sillago ciliata*) and dusky flathead (*Platycephalus fuscus*) (Vargas-Fonseca et al. 2016; Henderson et al. 2017).

Over 3,000 species of marine invertebrates have been recorded in the Bay (Davie and Hooper in Tibbets et al. 1998; Johnson 1999), with many species contributing to the high value fisheries (e.g. banana (*Fenneropenaeus* spp.), king (*Melicertus* spp.), endeavour (*Metapenaeus* spp.), tiger (*Penaeus* spp.), school

(*Metapenaeus* spp.) and greasy-back (*Metapenaeus* spp.) prawns; mud (*Scylla serrata*, blue swimmer (*Portunus armatus*) and spanner (*Ranina ranina*) crabs (QFish 2018). Other species of commercial significance include Onuphidae bait worms, squid (*Photololigo*/ *Sepioteuthis*/ *Nototodarus* spp.), cuttlefish (*Sepia* spp.), rock oysters (*Saccostrea glomerata*) and beche-de-mer/ sea cucumber (*Holothuria fuscogilva*, *Actinopyga spinea* and *Stichopus* spp.) (BMT WBM 2008; QFish 2018).

Within Moreton Bay, 30 freshwater fish species have been recorded (Pusey et al. 2004) and 66 aquatic macroinvertebrate taxa have been recorded on North Stradbroke Island alone (Marshall et al. 2011). The wallum wetland habitats of Moreton Bay support nationally threatened fish species. See section 6.1.2 vi for additional information.

**[x] Criterion 8 : Fish spawning grounds, etc.**

To justify this Criterion, please give information in the box below. Completion of details on relevant fish species in the section Criteria & justification> Animal species (3.3) is optional.

Justification (This field is limited to 3000 characters)

Moreton Bay provides important habitats, feeding areas, dispersal and migratory pathways for approximately 750 marine and estuarine fish species (Johnson 1999; Johnson 2010). Some of these fish and shellfish species have important fisheries resource values both within and external to the site.

Documented fish feeding habitats in Moreton Bay include saltmarshes, mangroves, intertidal flats, seagrasses as well as coral and rocky reefs (Laegdsgaard and Johnson 2001; Hollingsworth and Connolly 2006; Gilby et al. 2011; Ebrahim et al. 2014; Pearson and Stevens 2015; Yabsley et al. 2016; Gilby et al. 2017b). This includes tidal marshes feeding habitats for commercially important species including whiting, mullet and the giant mud crab (Thomas and Connolly 2001, McPhee et al. 2015; Meynecke and Richards 2014). Moreton Bay mangroves and seagrasses also provide refuge from predators (Laegdsgaard and Johnson 2001) and; together with saltmarshes, function as nursery habitats for juvenile fish (Blaber et al. 1980; Morton et al. 1987; Laegdsgaard and Johnson 1995).

Mangroves play an indirect role in supporting coral reef food webs by providing important refuge for some juvenile reef fish species, while seagrass beds in close proximity to reefs can also contribute to inshore reef fish diets (Kieckbusch et al. 2004 in Davis et al. 2014). A range of fish species move into mangroves to feed, indicating this habitat's importance to foraging reef species (Olds et al. 2012; Martin et al. 2015).

Intertidal habitats, particularly soft sediment tide pools, act as essential habitat for small fishes and nurseries for juvenile fish species (Krück et al. 2009; Chargulaf et al. 2011). Many of these species also spawn in inshore waters, particularly near the surf zone and in sandy channels within the boundaries of the Ramsar site (Chargulaf et al. 2011).

Spawning aggregations of yellowfin bream, *Acanthopagrus australis*, have been observed in the Bay (Pollock 1982) and breeding aggregations of the double-ended pipefish, *Syngnathoides biaculeatus* have been reported from seagrass meadows (Takahashi and Connolly 2003). Migration of some fish species also appear to occur in Moreton Bay, either for movement to spawn over surf bars or to migrate from shallower habitats as juveniles into offshore waters as adults (Pollock 1982; Davis et al. 2015). Studies have also shown that the variety of habitats, including the central reefs in Moreton Bay, may serve as stepping stones for some species of fish during their migrations (Olds et al. 2012).

**[x] Criterion 9 : >1% non-avian animal population**

To justify this Criterion, please give details on relevant non-avian species and their population size in the section Criteria & justification> Animal species (3.3)

Optional text box to provide further information (This field is limited to 3000 characters)

The site provides or is likely to provide habitat for >1% of the population of the following wetland dependent non-avian species:

- Wallum froglet (*Crinia tinnula*)
- Cooloola sedgefrog (*Litoria cooloolensis*)
- Wallum sedgefrog (*Litoria olongburensis*)
- Wallum rocketfrog (*Litoria freycineti*)
- Dugong (*Dugong dugon*)
- Oxleyan pygmy perch (*Nannoperca oxleyana*)

- Water mouse (*Xeromys myoides*)
- Illidge's ant blue butterfly (*Acrodipsas illidgei*)
- Loggerhead turtle (*Caretta caretta*)
- Green turtle (*Chelonia mydas*)

See Section 6.1.2 vi for additional information and for a justification for each of these species meeting the criteria



### 3.2 Plant species whose presence relates to the international importance of the site

Scientific name*	Common name	Criterion 2	Criterion 3	Criterion 4	IUCN Red List <sup>3</sup>	CITES Appendix I	Other status	Justification
<i>Cryptocarya foetida</i>	stinking cryptocarya	[x]	[x]	[]		[]	National (EPBC Act) – vulnerable; QLD (Nature Conservation Act 1992) – VU	Only recorded on mainland between Gympie and Ballina (NSW) as well as North Stradbroke and St Helena islands in Moreton Bay. As outlined in section 6.1.2: Additional documents - RIS offline.
<i>Olearia hygrophila</i>	swamp daisy	[x]	[x]	[]		[]	National (EPBC Act) – endangered; QLD (Nature Conservation Act 1992) – EN	Endemic to North Stradbroke Island, wetland dependent. As outlined in section 6.1.2: Additional documents - RIS offline.
<i>Phaius australis</i>	lesser swamp orchid	[x]	[x]	[]		[]	National (EPBC Act) – endangered; QLD (Nature Conservation Act 1992) – EN	Found frequently on the bay islands, however rarely on the mainland. As outlined in section 6.1.2: Additional

								documents - RIS offline.
<i>Phaius australis bernaysii</i>	yellow swamp	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	National (EPBC Act) – endangered; QLD (Nature Conservation Act 1992) – EN	Found frequently on the bay islands, however rarely on the mainland. As outlined in section 6.1.2: Additional documents - RIS offline.

*Optional text box to provide further information on plant species of international importance:*

*(This field is limited to 3000 characters)*

See section 6.1.2 vi for additional information and for a more expansive account of the site values relating to plants. Nature Conservation Act 1992 is the Queensland state legislation pertaining to native flora and fauna species, including state level conservation status.



### 3.3 Animal species whose presence relates to the international importance of the site

Phylum	Scientific name*	Common name	Species qualifies under criterion				Species contributes under criterion				Pop. Size <sup>4</sup>	Period of pop. Est. <sup>4</sup>	% occurrence <sup>4</sup>	IUCN Red List <sup>5</sup>	CITES Appendix I	CMS Appendix I	Other Status	Justification
			2	4	6	9	3	5	7	8								
Birds																		
CHORDATA/AVES	<i>Actitis hypoleucos</i>	Common sandpiper	[X]	[X]	[ ]	[ ]	[X]	[X]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA);	Criterion 4: Migration As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Apus pacificus</i>	Fork-tailed Swift	[X]	[X]	[ ]	[ ]	[X]	[X]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Arenaria interpres</i>	Ruddy Turnstone	[X]	[X]	[ ]	[ ]	[X]	[X]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Botaurus poiciloptilus</i>	Australasian Bittern	[X]	[ ]	[ ]	[ ]	[X]	[X]	[ ]	[ ]				EN	[ ]	[ ]	National (EPBC Act) – endangered; QLD (Nature Conservation Act 1992) - LC	Wetland dependent.

<sup>4</sup> Percentage of the total biogeographic population at the site. These fields are only compulsory to justify criteria 6 & 9

<sup>5</sup>

Ramsar Site 631. Moreton Bay - Australia

CHORDATA/AVES	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	[x]	[x]	[x]	[ ]	[x]	[x]	[ ]	[ ]	1550	2013-2017	1.82	LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); QLD (Nature Conservation Act 1992) – SL	Regularly exceeds 1% Hansen et al. 2016 population threshold. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Calidris alba</i>	Sanderling	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Calidris canutus</i>	Red Knot	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				NT	[x]	[ ]	National (EPBC Act) – endangered, marine, migratory (CMS CAMBA, JAMBA, ROKAMBA);	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Calidris ferruginea</i>	Curlew Sandpiper	[x]	[x]	[x]	[ ]	[x]	[x]	[ ]	[ ]	2126	2013-2017	2.36	NT	[ ]	[ ]	National (EPBC Act) – critically endangered, marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); QLD (Nature Conservation Act 1992) – EN	Regularly exceeds 1% Hansen et al. 2016 population threshold. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Calidris melanotos</i>	Pectoral Sandpiper	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Calidris ruficollis</i>	Red-necked Stint	[x]	[x]	[x]	[ ]	[x]	[x]	[ ]	[ ]	4919	2013-2017	1.04	NT	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); QLD (Nature	Regularly exceeds 1% Hansen et al. 2016 population threshold. As outlined in

Ramsar Site 631. Moreton Bay - Australia

																Conservation Act 1992) – SL	section 6.1.2: Additional documents - RIS offline.	
CHORDATA/AVES	<i>Calidris tenuirostris</i>	Great Knot	[X]	[X]	[ ]	[ ]	[X]	[X]	[ ]	[ ]				EN	[ ]	[X]	National (EPBC Act) – critically endangered, marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA; QLD (Nature Conservation Act 1992) – EN	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Calonectris leucomelas</i>	Streaked Shearwater	[X]	[X]	[ ]	[ ]	[X]	[X]	[ ]	[ ]				NT	[ ]	[ ]	National (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Charadrius bicinctus</i>	Double-banded Plover	[X]	[X]	[X]	[ ]	[X]	[X]	[ ]	[ ]	248	2013-2017	1.31	LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS)	Regularly exceeds 1% Hansen et al. 2016 population threshold. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Charadrius leschenaultii</i>	Greater Sand Plover	[X]	[X]	[ ]	[ ]	[X]	[X]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – vulnerable, marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); QLD (Nature Conservation Act 1992) – VU	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Charadrius mongolus</i>	Lesser Sand Plover	[X]	[X]	[X]	[ ]	[X]	[X]	[ ]	[ ]	1949	2013-2017	1.08	LC	[ ]	[ ]	National (EPBC Act) – endangered, marine, migratory (CMS, CAMBA,	Regularly exceeds 1% Hansen et al. 2016 population threshold. As

																JAMBA, ROKAMBA); QLD (Nature Conservation Act 1992) – EN	outlined in section 6.1.2: Additional documents - RIS offline.	
CHORDATA/AVES	<i>Charadrius veredus</i>	Oriental Plover	[x]	[x]	[]	[]	[x]	[x]	[]	[]				LC	[]	[]	National (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Chlidonias leucopterus</i>	White-winged Tern	[x]	[x]	[]	[]	[x]	[x]	[]	[]				LC	[]	[]	National (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Cuculus optatus</i>	Oriental cuckoo	[x]	[x]	[]	[]	[x]	[]	[]	[]					[]	[]	National (EPBC Act) – migratory (CAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Diomedea exulans</i>	Wandering Albatross	[x]	[x]	[]	[]	[x]	[x]	[]	[]				VU	[]	[]	National (EPBC Act) – vulnerable, Marine, Migratory (CMS); QLD (Nature Conservation Act 1992) – VU	As outlined in section 6.1.2: Additional documents - RIS offline
CHORDATA/AVES	<i>Esacus magnirostris</i>	Beach stone-curlew	[x]	[x]	[]	[]	[x]	[]	[]	[]				NT	[]	[]	National (EPBC Act) - marine; QLD (Nature Conservation Act 1992) – VU	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Fregata ariel</i>	Lesser Frigatebird	[x]	[x]	[]	[]	[x]	[x]	[]	[]				LC	[]	[]	National (EPBC Act) – marine, migratory(CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Fregata minor</i>	Great Frigatebird	[x]	[x]	[]	[]	[x]	[x]	[]	[]				LC	[]	[]	National (EPBC Act) – marine,	As outlined in section 6.1.2: Additional

Ramsar Site 631. Moreton Bay - Australia

																migratory (CAMBA, JAMBA)	documents - RIS offline.	
CHORDATA/AVES	<i>Fregetta grallaria</i>	White-bellied Storm Petrel	[x]	[ ]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – vulnerable; QLD (Nature Conservation Act 1992) – LC	
CHORDATA/AVES	<i>Gallinago hardwickii</i>	Latham's Snipe	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Gelochelidon nilotica</i>	Gull-billed Tern	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Haematopus longirostris</i>	Australian Pied Oystercatcher	[ ]	[x]	[x]	[ ]	[x]	[x]	[ ]	[ ]	560	2013-2017	5.09	LC	[ ]	[ ]	QLD (Nature Conservation Act 1992) – LC	Regularly exceeds 1% WPE5 population threshold, based on QWSG database population estimate. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Halobaena caerulea</i>	Blue Petrel	[x]	[ ]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – vulnerable, marine; QLD (Nature Conservation Act 1992) – LC	
CHORDATA/AVES	<i>Hirundapus caudacutus</i>	White-throated Needletail	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory	As outlined in section 6.1.2: Additional

																	(CAMBA, JAMBA, ROKAMBA)	documents - RIS offline.
CHORDATA/AVES	<i>Hydroprogne caspia</i>	Caspian Tern	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (JAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Lathamus discolor</i>	Swift Parrot	[x]	[ ]	[ ]	[ ]	[x]	[ ]	[ ]	[ ]				CR	[ ]	[ ]	National (EPBC Act) – critically endangered, marine; QLD (Nature Conservation Act 1992) – EN	
CHORDATA/AVES	<i>Limicola falcinellus</i>	Broad-billed Sandpiper	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Limnodromus semipalmatus</i>	Asian Dowitcher	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				NT	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Limosa lapponica</i>	Bar-tailed Godwit	[x]	[x]	[x]	[ ]	[x]	[x]	[ ]	[ ]	11650	2013-2017	3.58	NT	[ ]	[ ]	National (EPBC Act) – vulnerable, marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); QLD (Nature Conservation Act 1992) – VU	Regularly exceeds 1% Hansen et al. 2016 population threshold. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Limosa limosa</i>	Black-tailed Godwit	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				NT	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.

Ramsar Site 631. Moreton Bay - Australia

CHORDATA/AVES	<i>Macronectes giganteus</i>	Southern Giant Petrel	[x]	[x]	[]	[]	[x]	[x]	[]	[]				LC	[]	[]	National (EPBC Act) – endangered, marine, migratory (CMS); QLD (Nature Conservation Act 1992) – EN	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Macronectes halli</i>	Northern Giant Petrel	[x]	[x]	[]	[]	[x]	[x]	[]	[]				LC	[]	[]	National (EPBC Act) – vulnerable, marine, migratory (CMS); QLD (Nature Conservation Act 1992) – VU	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Monarcha melanopsis</i>	Black-faced Monarch	[x]	[x]	[]	[]	[x]	[]	[]	[]				LC	[]	[]	National (EPBC Act) – marine, migratory (CMS)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Motacilla flava</i>	Yellow Wagtail	[x]	[x]	[]	[]	[x]	[]	[]	[]				LC	[]	[]	National (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Myiagra cyanoleuca</i>	Satin Flycatcher	[x]	[x]	[]	[]	[x]	[]	[]	[]				LC	[]	[]	National (EPBC Act) – marine, migratory (CMS)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Numenius madagascariensis</i>	Eastern Curlew	[x]	[x]	[x]	[]	[x]	[x]	[]	[]	3158	2013-2017	9.02	EN	[]	[x]	National (EPBC Act) – critically endangered, marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); QLD (Nature Conservation Act 1992) – EN	Regularly exceeds 1% Hansen et al. 2016 population threshold. As outlined in section 6.1.2: Additional documents - RIS offline.

Ramsar Site 631. Moreton Bay - Australia

CHORDATA/AVES	<i>Numenius minutus</i>	Little Curlew	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Numenius phaeopus</i>	Whimbrel	[x]	[x]	[x]	[ ]	[x]	[x]	[ ]	[ ]	1140	2013-2017	1.75	LC	[ ]	[ ]	National (EPBC Act) - marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); QLD (Nature Conservation Act 1992) – SL	Regularly exceeds 1% Hansen et al. 2016 population threshold. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Oceanites oceanicus</i>	Wilson's Storm-Petrel	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (JAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Onychoprion anaethetus</i>	Bridled Tern	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – migratory (CAMBA, JAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Pandion cristatus</i>	Eastern Osprey	[x]	[x]	[ ]	[ ]	[x]	[ ]	[ ]	[ ]					[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Phaethon rubricauda</i>	Red-tailed Tropicbird	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CAMBA, JAMBA); QLD (Nature Conservation Act 1992) – VU	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Phoebastria palpebrata</i>	Light-mantled Albatross	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				NT	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS)	As outlined in section 6.1.2: Additional



Ramsar Site 631. Moreton Bay - Australia

																		documents - RIS offline.
CHORDATA/AVES	<i>Plegadis falcinellus</i>	Glossy Ibis	[x]	[x]	[]	[]	[x]	[x]	[]	[]				LC	[]	[]	National (EPBC Act) – marine, migratory (CMS)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Pluvialis fulva</i>	Pacific Golden Plover	[x]	[x]	[]	[]	[x]	[x]	[]	[]				LC	[]	[]	National (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Pluvialis squatarola</i>	Grey Plover	[x]	[x]	[]	[]	[x]	[x]	[]	[]				LC	[]	[]	National (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Puffinus carneipes</i>	Flesh-footed Shearwater	[x]	[x]	[]	[]	[x]	[x]	[]	[]				NT	[]	[]	National (EPBC Act) – marine, migratory (JAMBA, ROKAMBA )	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Puffinus griseus</i>	Sooty Shearwater	[x]	[x]	[]	[]	[x]	[x]	[]	[]				NT	[]	[]	National (EPBC Act) – marine, migratory (JAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Puffinus pacificus</i>	Wedge-tailed Shearwater	[x]	[x]	[]	[]	[x]	[x]	[]	[]				LC	[]	[]	National (EPBC Act) – marine, migratory (JAMBA); QLD (Nature Conservation Act 1992) – VU	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Puffinus tenuirostris</i>	Short-tailed Shearwater	[x]	[x]	[]	[]	[x]	[x]	[]	[]				LC	[]	[]	National (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.

Ramsar Site 631. Moreton Bay - Australia

CHORDATA/AVES	<i>Rostratula australis</i>	Australian Painted Snipe	[x]	[ ]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				EN	[ ]	[ ]	National (EPBC Act) – endangered, marine; QLD (Nature Conservation Act 1992) – VU	
CHORDATA/AVES	<i>Stercorarius longicaudus</i>	Long-tailed Jaeger	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CAMBA, JAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Stercorarius parasiticus</i>	Arctic jaeger	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Stercorarius pomarinus</i>	Pomarine Jaeger	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CAMBA, JAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Sterna dougallii</i>	Roseate Tern	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CAMBA, JAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Sterna hirundo</i>	Common Tern	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Sterna paradisaea</i>	Arctic Tern	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Sterna sumatrana</i>	Black-naped Tern	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine,	As outlined in section 6.1.2: Additional

																migratory (CAMBA, JAMBA)	documents - RIS offline.	
CHORDATA/AVES	<i>Sternula albifrons</i>	Little Tern	[X]	[X]	[ ]	[ ]	[X]	[X]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS, JAMBA, CAMBA, ROKAMBA); QLD (Nature Conservation Act 1992) – SL	Breeding recorded. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Sula dactylatra</i>	Masked Booby	[X]	[X]	[ ]	[ ]	[X]	[X]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Sula leucogaster</i>	Brown Booby	[X]	[X]	[ ]	[ ]	[X]	[X]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Thalassarche bulleri</i>	Buller's Albatross	[X]	[X]	[ ]	[ ]	[X]	[X]	[ ]	[ ]				NT	[ ]	[ ]	National (EPBC Act) –vulnerable, marine, migratory (CMS); QLD (Nature Conservation Act 1992) – VU	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Thalassarche carteri</i>	Indian Yellow-nosed Albatross	[X]	[ ]	[ ]	[ ]	[X]	[X]	[ ]	[ ]				EN	[ ]	[ ]	National (EPBC Act) –vulnerable, marine, migratory (CMS); QLD (Nature Conservation Act 1992) – VU	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Thalassarche cauta</i>	Shy Albatross	[X]	[X]	[ ]	[ ]	[X]	[X]	[ ]	[ ]				NT	[ ]	[ ]	National (EPBC Act) –vulnerable, marine, migratory (CMS); QLD (Nature Conservation Act 1992) – VU	As outlined in section 6.1.2: Additional documents - RIS offline.

Ramsar Site 631. Moreton Bay - Australia

CHORDATA/AVES	<i>Thalassarche chrysostoma</i>	Grey-headed Albatross	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				EN	[ ]	[ ]	National (EPBC Act) –endangered, marine, migratory (CMS); QLD (Nature Conservation Act 1992) – VU	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Thalassarche melanophris</i>	Black-browed Albatross	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) –vulnerable, marine, migratory (CMS); QLD (Nature Conservation Act 1992) – SL	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Tringa brevipes</i>	Grey-tailed Tattler	[x]	[x]	[x]	[ ]	[x]	[x]	[ ]	[ ]	2430	2013-2017	3.47	NT	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); QLD (Nature Conservation Act 1992) – SL	Regularly exceeds 1% Hansen et al. 2016 population threshold. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Tringa glareola</i>	Wood Sandpiper	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Tringa incana</i>	Wandering Tattler	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS, JAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Tringa nebularia</i>	Common Greenshank	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline
CHORDATA/AVES	<i>Tringa stagnatilis</i>	Marsh Sandpiper	[x]	[x]	[ ]	[ ]	[x]	[x]	[ ]	[ ]				LC	[ ]	[ ]	National (EPBC Act) – marine, migratory (CMS,	As outlined in section 6.1.2: Additional

																	CAMBA, JAMBA, ROKAMBA)	documents - RIS offline.
CHORDATA/AVES	<i>Tringa totanus</i>	Common Redshank	[x]	[x]	[]	[]	[x]	[x]	[]	[]				LC	[]	[]	National (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AVES	<i>Xenus cinereus</i>	Terek Sandpiper	[x]	[x]	[]	[]	[x]	[x]	[]	[]				LC	[]	[]	National (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); QLD (Nature Conservation Act 1992) – SL	As outlined in section 6.1.2: Additional documents - RIS offline.
Fish, Mollusc and Crustacea																		
CHORDATA/ELASMOBRANCHII	<i>Carcharias taurus</i>	Greynurse shark	[x]	[]	[]	[]	[x]	[]	[x]	[]				VU	[]	[]	National (EPBC Act) – critically endangered; QLD (Nature Conservation Act 1992) – EN	Iconic species. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/ELASMOBRANCHII	<i>Carcharodon carcharias</i>	Great white shark	[x]	[]	[]	[]	[x]	[]	[x]	[]				VU	[]	[x]	National (EPBC Act) – vulnerable, migratory (CMS)	Iconic species. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/ELASMOBRANCHII	<i>Hemitrygon fluviorum</i>	Estuary Stingray	[x]	[]	[]	[]	[]	[]	[]	[]				VU	[]	[]		
CHORDATA/ELASMOBRANCHII	<i>Isurus oxyrinchus</i>	Shortfin mako	[x]	[]	[]	[]	[x]	[]	[x]	[]				VU	[]	[]	National (EPBC Act) – migratory (CMS)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/ELASMOBRANCHII	<i>Manta birostris</i>	Manta ray	[x]	[]	[]	[]	[x]	[]	[x]	[]				VU	[]	[x]	National (EPBC Act) – marine, migratory (CMS)	Iconic species. As outlined in section 6.1.2: Additional

																	documents - RIS offline.
CHORDATA/ELASMOBRANCHII	<i>Mobula japonica</i>	Japanese devilray	[x]	[ ]	[ ]	[ ]	[x]	[ ]	[x]	[ ]				NT	[ ]	[x]	National (EPBC Act) – migratory (CMS)  As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/ACTINOPTERYGII	<i>Nannoperca oxleyana</i>	Oxleyan pygmy perch	[x]	[x]	[ ]	[x]	[x]	[ ]	[x]	[x]	1	2009	1.1	EN	[ ]	[ ]	National (EPBC Act) – endangered; QLD (Nature Conservation Act 1992) – VU  Comprehensive sampling efforts indicate this species has a significant proportion of their population at Moreton and North Stradbroke Islands (Knight et al. 2009). As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/ELASMOBRANCHII	<i>Sphyrna lewini</i>	Scalloped hammerhead	[x]	[ ]	[ ]	[ ]	[x]	[ ]	[x]	[ ]				EN	[ ]	[ ]	National (EPBC Act) – conservation dependent  As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/ELASMOBRANCHII	<i>Sphyrna mokarran</i>	Great hammerhead	[x]	[ ]	[ ]	[ ]	[x]	[ ]	[x]	[ ]				EN	[ ]	[ ]	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/ACTINOPTERYGII	<i>Syngnathoides biaculeatus</i>	Double-ended pipefish	[ ]	[ ]	[ ]	[ ]	[x]	[ ]	[x]	[x]				LC	[ ]	[ ]	National (EPBC Act) – marine  As outlined in section 6.1.2: Additional documents - RIS offline.
<b>Others</b>																	

Ramsar Site 631. Moreton Bay - Australia

CHORDATA/REPTILIA	<i>Caretta caretta</i>	Loggerhead turtle	[x]	[x]	[]	[x]	[x]	[]	[]	[]	20	2005-2018	2.5	VU	[x]	[x]	National (EPBC Act) – endangered, marine, migratory (CMS); QLD (Nature Conservation Act 1992) – EN	Resident nesting population in Moreton Bay, strong fidelity to foraging grounds. Population size based on nesting females and a total population of 700-800 females. As outlined in section 6.1.2: Additional documents - RIS offline
CHORDATA/REPTILIA	<i>Chelonia mydas</i>	Green turtle	[x]	[x]	[]	[x]	[x]	[]	[]	[]	10000	1993-2018	1.4	EN	[x]	[x]	National (EPBC Act) – vulnerable, marine, migratory (CMS); QLD (Nature Conservation Act 1992) – VU	Resident population in Moreton Bay. Important feeding grounds with occasional nesting. Percentage population calculated based on an estimated total population of 700,000 individuals. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AMPHIBIA	<i>Crinia tinnula</i>	Wallum froglet	[x]	[x]	[]	[x]	[x]	[]	[]	[]	10000	2018	1.1	VU	[]	[]	QLD (Nature Conservation Act 1992) – VU	Acid wetland dependant. Population size and percentage estimate based on expert opinion (Hines, H pers. comm. 2018). The total

																	population is estimated to between 10000s to 100000s and occurring >1% at the site. As outlined in section 6.1.2: Additional documents - RIS offline.	
CHORDATA/REPTILIA	<i>Dermochelys coriacea</i>	Leatherback turtle	[x]	[x]	[ ]	[ ]	[x]	[ ]	[ ]	[ ]				VU	[x]	[x]	National (EPBC Act) – endangered, marine, migratory (CMS); QLD (Nature Conservation Act 1992) – EN	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/MAMMALIA	<i>Dugong dugon</i>	Dugong	[x]	[x]	[ ]	[x]	[x]	[ ]	[ ]	[ ]	850	1995- 2016	97	VU	[x]	[ ]	National (EPBC Act) – marine, migratory (CMS); QLD (Nature Conservation Act 1992) – VU	The population of dugongs within the Bay is considered genetically distinct from other dugong populations, with an estimated 2-3% migration. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/REPTILIA	<i>Eretmochelys imbricata</i>	Hawksbill turtle	[x]	[x]	[ ]	[ ]	[x]	[ ]	[ ]	[ ]				CR	[x]	[x]	National (EPBC Act) – vulnerable, marine, migratory (CMS); QLD (Nature Conservation Act 1992) – EN	Resident population in Moreton Bay. As outlined in section 6.1.2: Additional documents - RIS offline.



Ramsar Site 631. Moreton Bay - Australia

CHORDATA/MAMMALIA	<i>Eubalaena australis</i>	Southern Right Whale	[x]	[x]	[]	[]	[x]	[]	[]	[]				LC	[x]	[x]	National (EPBC Act) – endangered, cetacean, migratory (CMS); QLD (Nature Conservation Act 1992) – LC	Seasonal visitor, important to tourism. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/REPTILIA	<i>Lepidochelys olivacea</i>	Olive ridley turtle	[x]	[x]	[]	[]	[x]	[]	[]	[]				VU	[x]	[x]	National (EPBC Act) – endangered, marine, migratory (CMS); QLD (Nature Conservation Act 1992) – EN	Resident population in Moreton Bay. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AMPHIBIA	<i>Litoria cooloolensis</i>	Cooloola sedgefrog	[x]	[x]	[]	[x]	[x]	[]	[]	[]	1000	2018	1.1	EN	[]	[]	QLD (Nature Conservation Act 1992) – NT	Acid wetland dependant. Population size and percentage estimate based on expert opinion (Hines, H pers. comm. 2018). The total population is estimated to between 1000s to 10000s and occurring >1% at the site. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AMPHIBIA	<i>Litoria freycineti</i>	Wallum rocketfrog	[x]	[x]	[]	[x]	[x]	[]	[]	[]	1000	2018	1.1	VU	[]	[]	QLD (Nature Conservation Act 1992) – VU	Acid wetland dependant, highly fragmented distribution, generally at low abundance. Population size and percentage

																		estimate based on expert opinion (Hines, H pers. comm. 2018). The total population is estimated to be in the 1000s and occurring >1% at the site. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/AMPHIBIA	<i>Litoria olongburensis</i>	Wallum sedgefrog	[x]	[x]	[]	[x]	[x]	[]	[]	[]	10000	2018	1.1	VU	[]	[]	National (EPBC Act) – vulnerable; QLD (Nature Conservation Act 1992) – VU	Acid wetland dependant, restricted to North Stradbroke Island and Great Sandy sandmasses. Population size and percentage estimate based on expert opinion (Hines, H pers. comm. 2018). The total population is estimated to be between 10000s to 100000s and occurring >1% at the site. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/MAMMALIA	<i>Megaptera novaeangliae</i>	Humpback Whale	[x]	[x]	[]	[]	[x]	[]	[]	[]				LC	[x]	[x]	National (EPBC Act) – vulnerable, cetacean, migratory (CMS); QLD (Nature	Seasonal visitor, important to tourism. As outlined in section 6.1.2:

																	Conservation Act 1992) – VU	Additional documents - RIS offline.
CHORDATA/REPTILIA	<i>Natator depressus</i>	Flatback turtle	[x]	[x]	[]	[]	[x]	[]	[]	[]					[x]	[]	National (EPBC Act) – vulnerable, marine, migratory (CMS); QLD (Nature Conservation Act 1992) – VU	Resident population in Moreton Bay. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/MAMMALIA	<i>Phascolarctos cinereus</i>	Koala	[x]	[]	[]	[]	[x]	[]	[]	[]				VU	[]	[]	National (EPBC Act) – vulnerable; QLD (Nature Conservation Act 1992) – VU	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/MAMMALIA	<i>Physeter macrocephalus</i>	Sperm Whale	[x]	[x]	[]	[]	[x]	[]	[]	[]				VU	[x]	[x]	National (EPBC Act) – cetacean, migratory (CMS); QLD (Nature Conservation Act 1992) – LC	As outlined in section 6.1.2: Additional documents - RIS offline.
ARTHROPODA/INSECTA	<i>Pseudodipsas illidgei</i>	Illidge’s ant-blue butterfly	[x]	[x]	[]	[x]	[x]	[]	[]	[]	1		1.1	EN	[]	[]	QLD (Nature Conservation Act 1992) – VU	This rarely seen species is restricted to mangrove forests and endemic to the central east coast of Australia. The Moreton Bay Region is one of only six confirmed areas for the species, While there are no published estimations of the population size, number of recordings within Moreton Bay accounts for

																	approximately 40% of total recordings of the species according to Queensland Government (species profile-18 records) and Atlas of Living Australia (ala.org.au) (49 records).	
CHORDATA/MAMMALIA	<i>Sousa chinensis</i>	Australian humpback dolphin	[x]	[x]	[]	[]	[x]	[]	[]	[]				VU	[x]	[]	National (EPBC Act) – cetacean, migratory (CMS); QLD (Nature Conservation Act 1992) – VU	Resident population, important to tourism. As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/MAMMALIA	<i>Stenella attenuata</i>	Pantropical Spotted Dolphin	[x]	[x]	[]	[]	[x]	[]	[]	[]				LC	[]	[]	National (EPBC Act) – cetacean, migratory (CMS)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/MAMMALIA	<i>Stenella longirostris</i>	Spinner Dolphin	[x]	[x]	[]	[]	[x]	[]	[]	[]				LC	[]	[]	National (EPBC Act) – cetacean, migratory (CMS)	As outlined in section 6.1.2: Additional documents - RIS offline.
CHORDATA/MAMMALIA	<i>Xeromys myoides</i>	Water mouse	[x]	[x]	[]	[x]	[x]	[]	[]	[]	1		1.1	VU	[x]	[]	National (EPBC Act) – vulnerable; QLD (Nature Conservation Act 1992) – VU	Wetland dependent. High density population in Pumicestone Passage and Southern Moreton Bay incl. North and South Stradbroke Island. Total population

[illegible]

*Optional text box to provide further information on animal species of international importance:*

*(This field is limited to 3000 characters)*

\*Note that for the listings in table 3.3, all species recorded under an international listing as a migratory species and occurring within the site are marked to contribute to criterion 4.

\*\*Note that the invertebrate *Tenuibranchiurus glypticus* (swamp crayfish), listed as endangered on the IUCN red list and vulnerable under the Queensland Nature Conservation Act 1992, also contributes to criterion 2 and 3 in 3.3 listing above but was not available in this database.

\*\*\*Some scientific names may have been updated (refer 6.1.2 additional information).

\*\*\*\*Note that for the acid frog species (*Crinia tinnula*, *Litoria longburensis*, *Litoria cooloolensis* and *Litoria freycineti*) as well as *Nannoperca oxleyana*, *Acrodipsas illidgei* and *Xeromys myoides* under criterion 9, the numerical percentage occurrence denoted as 1.1 refers to an estimated population above 1 per cent. The population of acid frog species recorded in table 3.3 is the lowest within the estimate range. The number one (1) in the population size box for *Nannoperca oxleyana*, *Acrodipsas illidgei* and *Xeromys myoides* indicates that there are no current official records of the exact population at the site. See section 6.1.2 vi additional information for a more detailed justification of the listing of these species under criterion 9.

The Moreton Bay Ramsar site supports an abundance and diversity of native fauna, in particular a high abundance and species diversity of waterbirds, including threatened migratory shorebirds listed under international agreements, conventions and partnerships. It is also noteworthy that Moreton Bay represents the southern limit of the dugong's Australian distribution (Lanyon 2003) and currently contains one of the largest populations of dugongs on the east coast of Australia.

All six marine turtle species known to occur in Australian waters have been recorded in Moreton Bay (Limpus et al. 2006).

Seasonal aggregations occur for manta rays, grey nurse sharks and zebra sharks. Rocky reef outcrops near North Stradbroke Island contain the largest known aggregation of zebra sharks in the world (Couturier et al. 2011; Dudgeon et al. 2013).

A genetically distinct population of koalas (*Phascolarctos cinereus*) (listed as vulnerable under the Environment Protection and Biodiversity Conservation Act 1999) breed on North Stradbroke Island (Lee et al. 2010). Trees associated with the island's wetlands provide important koala habitat (GHD 2009). Percentage moisture content in the leaves of food trees needs to be maintained for koala survival (Melzer et al. 2000 in Cox and Specht 2012; Ellis et al. 2010).

See section 6.1.2 vi for additional information.

### 3.4 Ecological communities whose presence relates to the international importance of the site

Name of ecological community	Community qualifies under Criterion 2?	Description	Justification
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland	<input checked="" type="checkbox"/>	<a href="http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=142&amp;status=Endangered">http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=142&amp;status=Endangered</a>	National (EPBC Act) – Endangered
Lowland Rainforest of Subtropical Australia	<input checked="" type="checkbox"/>	<a href="http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=101&amp;status=Critically+Endangered">http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=101&amp;status=Critically+Endangered</a>	National (EPBC Act) – Critically endangered
Subtropical and Temperate Coastal Saltmarsh	<input checked="" type="checkbox"/>	<a href="http://www.environment.gov.au/biodiversity/threatened/communities/pubs/118-conservation-advice.pdf">http://www.environment.gov.au/biodiversity/threatened/communities/pubs/118-conservation-advice.pdf</a>	National (EPBC Act) – Vulnerable
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	<input checked="" type="checkbox"/>	<a href="http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=76&amp;status=Critically+Endangered">http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=76&amp;status=Critically+Endangered</a>	National (EPBC Act) – Critically endangered

Optional text box to provide further information (This field is limited to 3000 characters)

These threatened ecological communities include the following regional ecosystems, mapped and classified by the Queensland state government (See section 6.1.2 vi for additional information)

Casuarina glauca woodland on margins of marine clay plains (RE 12.1.1) Vegetation Management Act 1999 - Of concern, Biodiversity status (QLD) - Of concern.

Saltpan vegetation including grassland, herbland and sedgeland on marine clay plains (RE 12.1.2) Vegetation Management Act 1999 - Least concern, Biodiversity status (QLD) - No concern at present.

Notophyll vine forest on parabolic high dunes (RE 12.2.1) Vegetation Management Act 1999 - Of concern, Biodiversity status (QLD) - Of concern.

Microphyll/notophyll vine forest on beach ridges (RE 12.2.2) Vegetation Management Act 1999 - Of concern, Biodiversity status (QLD) - Endangered.

Complex notophyll vine forest (RE 12.3.1a) Vegetation Management Act 1999 - Endangered, Biodiversity status (QLD) - Endangered.

Melaleuca quinquenervia, Casuarina glauca +/- Eucalyptus tereticornis, E. siderophloia open forest on low coastal alluvial plains

(RE 12.3.20) Vegetation Management Act 1999 - Least concern, Biodiversity status (QLD) - Endangered.



## What is the Site like?

### 4.1 Ecological character

*Please summarize the ecological components, processes and services which are critical to determining the ecological character of the site. Please also summarize any natural variability in the ecological character of the site, and any known past or current change*

*(This field is limited to 4000 characters)*

The Moreton Bay Ramsar site supports outstanding coastal wetland features. Many of its diverse habitat types are natural or near-natural and are interconnected with other habitats, supporting biodiversity. The site is home to threatened plant species that are wetland dependant, such as the endangered swamp daisy (*Olearia hygrophila*), which is only found on North Stradbroke Island. It supports four ecological communities recognised as threatened nationally, including saltmarsh, rainforest and swamp oak (*Casuarina glauca*) communities.

The site provides habitat for humpback whales (*Megaptera novaeangliae*) and dolphins, as well as six species of marine turtles. Other threatened animals, including the dugong (*Dugong dugon*), wallum sedgefrog, (*Litoria olongburensis*), water mouse (*Xeromys myoides*) and oxleyan pygmy perch fish (*Nannoperca oxleyana*), also live in the Bay or in freshwater wetlands within the site.

Moreton Bay is one of the largest estuarine bays in Australia and sits in an 'overlap zone' where both tropical and temperate species occur. Tidal flats and associated estuarine areas help protect the coastline from erosion and provide critical habitat for migratory shorebirds. Mangrove and saltmarsh communities provide important primary production for a range of species, including commercially valuable fish and crab species. Parts of the site contain seagrass meadows vital for sustaining the Moreton Bay dugong (*Dugong dugon*) population. Coral reef communities support coral reef flora and fauna, as well as the loggerhead turtle (*Caretta caretta*).

The Bay's diversity of wetland habitats provides feeding areas, dispersal and migratory pathways, as well as spawning sites, for many fish species. The region supports one of the most productive fisheries in Queensland. Although the Bay only represents about 3% of Queensland's coastline, it produces just over 15% of the seafood for Queensland managed fisheries.

The perched wetlands, including lakes and swamps, are abundant in the coastal wallum regions of southeastern Queensland and northern New South Wales (including Moreton and North Stradbroke Islands), but are scarce in most parts of the world. Perched wetlands form in depressions between dunes where impermeable layers develop in the sand and hold water in the wetland above the surrounding water table. They support many unique and interesting animals (Marshall et al. 2011).

Underlying critical processes that are integral to the values and features of the site include:

- physical coastal
- hydrological e.g. tidal inundation, freshwater flows, groundwater interactions
- energy and nutrient dynamics
- biological
- climatic
- geomorphologic

The Bay's proximity to Brisbane and the Gold and Sunshine Coasts makes it ideal for visitors. More than 12 million visits to the Bay occur each year where people enjoy nature-based activities, from boating to snorkelling, diving, recreational fishing and camping (QPWS 2012). The Bay is a destination for watching migratory shorebirds (September to March) and whales (June to October).

The Ramsar site wetlands have significant social and cultural values, provide research and education opportunities, as well as a place for recreation and spiritual connection. Tangible evidence of past Traditional Owner occupation is found in many forms throughout Moreton Bay (Quandamooka) the islands, and mainland areas. There have been modifications to the Moreton Bay's catchment hydrology prior to the listing of the site associated with development and an increasing population. Since the site was listed, there has been further intensification in the catchment's to the site. However, there has also been much improvement in the management of pressures on the site (refer to section 5 of this document).

See section 6.1.2 vi for additional information.

## 4.2 What wetland type(s) are in the site?

Please list all wetland types which occur on the site, and for each of them: - rank the four most abundant types by area from 1 (greatest extent) to 4 (least extent) in the third column, - if the information exists, provide the area (in ha) in the fourth column - if this wetland type is used for justifying the application of Criterion 1, indicate if it is representative, rare or unique in the last column - you can give the local name of the wetland type if different from the Ramsar classification system in the second column

### Marine or coastal wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
A: Permanent shallow marine waters		4	5303	Representative
B: Marine subtidal aquatic beds (Underwater vegetation)		2	23759	Representative
C: Coral reefs		0	1955	Rare
D: Rocky marine shores		0	138	Representative
E: Sand, shingle or pebble shores		0	1828	Representative
F: Estuarine waters		1	34112	Representative
G: Intertidal mud, sand or salt flats		0	4681	Representative
H: Intertidal marshes		0	2733	Representative
I: Intertidal forested wetlands		3	11847	Representative
J: Coastal brackish / saline lagoons		0	35	
K: Coastal freshwater lagoons		0	1	

### Inland wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
Fresh water > Flowing water >> M: Permanent rivers/ streams/ creeks		0	5	Rare

Fresh water > Flowing water >> N: Seasonal/ intermittent/ irregular rivers/ streams/ creeks		0	5	
Fresh water > Lakes and pools >> O: Permanent freshwater lakes		0	15	Rare
Fresh water > Lakes and pools >> P: Seasonal/ intermittent freshwater lakes		0	81	
Fresh water > Lakes and pools >> Tp: Permanent freshwater marshes/ pools		0	4	Unique
Fresh water > Marshes on inorganic soils >> Ts: Seasonal/ intermittent freshwater marshes/ pools on inorganic soils		0	557	Rare
Fresh water > Marshes on peat soils >> U: Permanent Non- forested peatlands		0	3649	
Fresh water > Marshes on inorganic soils >> W: Shrub-dominated wetlands		0	106	Rare
Fresh water > Marshes on inorganic soils >> Xf: Freshwater, tree- dominated wetlands		0	2289	Representative
Fresh water > Marshes on peat soils >> Xp: Permanent Forested peatlands		0	2446	
Fresh water > Flowing water >> Y: Permanent		0	5	

Freshwater springs; oases				

Human-made wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
9: Canals and drainage channels or ditches		0	16	

*What non-wetland habitats are within the site?*

Other non-wetland habitat

Other non-wetland habitats within the site	Area (ha) if known

Habitat connectivity (ECD)

See section 6.1.2 vi for additional information.

## 4.3 Biological components

### 4.3.1 Plant species

#### Other noteworthy plant species

Scientific name	Common name (optional)	Position in range / endemism / other (optional)
<i>Acacia baueri baueri</i>	tiny wattle	Nature Conservation Act 1992 - VU
<i>Blandfordia grandiflora</i>	christmas bell	Nature Conservation Act 1992 – EN
<i>Durringtonia paludosa</i>	durringtonia	Nature Conservation Act 1992 – NT
<i>Eleocharis difformis</i>	spike rush	Nature Conservation Act 1992 – EN
<i>Maundia triglochinosides</i>		Nature Conservation Act 1992 – VU
<i>Prasophyllum exile</i>		Nature Conservation Act 1992 – NT
<i>Pterostylis nigricans</i>		Nature Conservation Act 1992 – NT
<i>Thelypteris confluens</i>		Nature Conservation Act 1992 – VU

#### Invasive alien plant species

Scientific name	Common name	Impacts	Changes at RIS update
<i>Acanthospermum australe</i>		Potentially	unknown
<i>Acokanthera oblongifolia</i>	bushman's poison	Potentially	unknown
<i>Agave americana</i>		Potentially	unknown
<i>Agave americana americana</i>		Potentially	unknown
<i>Agave sisalana</i>	sisal hemp	Potentially	unknown

Optional text box to provide further information (This field is limited to 2500 characters)

Noteworthy plant species - those species identified as threatened or near threatened under Queensland state legislation but not federally or internationally listed.

EN = endangered  
VU = vulnerable  
NT = near threatened

For Invasive alien plant species - this is an introduction to this list only, for full list see Section 6.1.2 - additional information. No detailed site specific assessment has been undertaken so 'potentially' should be taken to represent 'unassessed'.

#### 4.3.2 Animal species

##### Other noteworthy animal species

Phylum	Scientific name	Common name	Pop. size (optional)	Period of pop. est. (optional)	% occurrence (optional)	Position in range /endemism/other (optional)
CHORDATA/REPTILIA	<i>Acanthophis antarcticus</i>	common death adder				Nature Conservation Act 1992 – VU
CHORDATA/AMPHIBIA	<i>Adelotus brevis</i>	tusked frog				Nature Conservation Act 1992 – VU
CHORDATA/AVES	<i>Calyptorhynchus lathami</i>	Glossy Black Cockatoo				Nature Conservation Act 1992 – VU
CHORDATA/AVES	<i>Falco hypoleucos</i>	Grey Falcon				IUCN vulnerable, but not wetland dependent
CHORDATA/AVES	<i>Ninox strenua</i>	Powerful Boobook				Nature Conservation Act 1992 – VU
ARTHROPODA/INSECTA	<i>Ornithoptera richmondia</i>	Richmond birdwing				Nature Conservation Act 1992 – VU
CHORDATA/AVES	<i>Pezoporus wallicus wallicus</i>	eastern ground parrot				Nature Conservation Act 1992 – VU

##### Invasive alien animal species

Phylum	Scientific name	Common name	Impacts	Changes at RIS update
CHORDATA/AVES	<i>Acridotheres tristis</i>	Common Myna	Potentially	No change
CHORDATA/AVES	<i>Anas platyrhynchos</i>	Mallard	Potentially	No change
CHORDATA/AVES	<i>Cacatua tenuirostris</i>	Long-billed Corella	Potentially	No change

CHORDATA/MAMMALIA	<i>Canis lupus familiaris</i>	domestic dog	Potentially	No change
CHORDATA/MAMMALIA	<i>Capra hircus</i>	domestic goat	Potentially	No change
CHORDATA/AVES	<i>Carduelis carduelis</i>	Eurasian Goldfinch;European Goldfinch	Potentially	No change
CHORDATA/AVES	<i>Columba livia</i>	rock dove	Potentially	No change
CHORDATA/MAMMALIA	<i>Equus caballus</i>	Horse	Potentially	No change
CHORDATA/MAMMALIA	<i>Felis catus</i>	Domestic Cat	Potentially	No change
CHORDATA/ACTINOPTERYGII	<i>Gambusia holbrooki</i>		Potentially	No change
CHORDATA/REPTILIA	<i>Hemidactylus frenatus</i>	house gecko	Potentially	No change
CHORDATA/MAMMALIA	<i>Lepus europaeus</i>	European Hare	Potentially	No change
CHORDATA/AVES	<i>Lonchura punctulata</i>	Nutmeg Mannikin;Scaly-breasted Munia	Potentially	No change
CHORDATA/MAMMALIA	<i>Mus musculus</i>	House Mouse	Potentially	No change
CHORDATA/ACTINOPTERYGII	<i>Oreochromis spilurus</i>	Mozambique mouthbrooder	Potentially	No change
CHORDATA/AVES	<i>Passer domesticus</i>	House Sparrow	Potentially	No change
CHORDATA/AVES	<i>Pavo cristatus</i>	Indian Peafowl;Common Peafowl	Potentially	No change
CHORDATA/MAMMALIA	<i>Rattus rattus</i>	House Rat;Black Rat	Potentially	No change
CHORDATA/AMPHIBIA	<i>Rhinella marina</i>	Cane Toad	Potentially	No change
CHORDATA/AVES	<i>Streptopelia chinensis</i>	Spotted Dove	Potentially	No change
CHORDATA/AVES	<i>Sturnus vulgaris</i>	European Starling	Potentially	No change
CHORDATA/MAMMALIA	<i>Vulpes vulpes</i>	Red Fox	Potentially	No change

Optional text box to provide further information (This field is limited to 2500 characters)

Noteworthy animal species - those species identified as threatened or near threatened under Queensland state legislation but not federally or internationally listed.

EN - endangered

VU - vulnerable

NT - near threatened



For invasive alien animal species - no detailed site specific assessment has been undertaken so 'potentially' should be taken to represent 'unassessed'.

## 4.4 Physical components

### 4.4.1 Climate

Please indicate the prevailing climate type(s) by selecting below the climatic region(s) and subregion(s), using the Köppen-Gieger Climate Classification System.

Climatic region	Subregion
C: Moist Mid-Latitude climate with mild winters	Cfa: Humid subtropical (Mild with no dry season, hot summer)

If changing climatic conditions are affecting the site, please indicate the nature of these changes:

(This field is limited to 1000 characters)

Sea level rise may substantially change the distribution and extent of wetlands in Moreton Bay (Runting et al. 2017). Modelling based on higher sea level rise scenarios suggests a 4% - 31% loss of the current area of protected wetlands in southern Moreton Bay due to inundation (ibid). Changing climate is predicted to result in an increase in the intensity of rain events and consequential flooding (DEHP 2017a). Extreme weather events, such as the major floods that occurred in 1974 and 2011, can lead to increased loads of sediment and nutrients delivered to the bay. Changes in rainfall patterns may alter recharge of aquifers, as well as frequency and intensity of fires. Coastal development adjacent to the site may demand the construction of coastal defences (Abel et al. 2011). Other impacts include seawater intrusion into freshwater wetlands and aquifers, ocean acidification, and ecological impacts. See section 6.1.2 vi for additional information.

### 4.4.2 Geomorphic setting

a) Minimum elevation above sea level (in metres) (The online RIS only accepts numeric values)

0

a) Maximum elevation above sea level (in metres) (The online RIS only accepts numeric values)

270

b) Position in landscape/river basin:

- ☐ Entire river basin
- ☐ Upper part of river basin
- ☐ Middle part of river basin
- ☒ Lower part of river basin
- ☒ More than one river basin
- ☐ Not in river basin
- ☒ Coastal

Please name the river basin or basins. If the site lies in a sub-basin, please also name the larger river basin.

For a coastal/marine site, please name the sea or ocean. (This field is limited to 1000 characters)

Moreton Bay is located in the North East Coast Drainage Division.

There are six drainage basins: Brisbane, Logan-Albert, Maroochy, Moreton Bay Islands, Pine and South Coast. (<http://www.bom.gov.au/water/about/riverBasinAuxNav.shtml>)

Moreton Bay enters the Pacific Ocean

### 4.4.3 Soil

☒ Mineral

Changes at RIS update (Update)

☒ No change / ☐ Increase / ☐ Decrease / ☐ Unknown

☒ Organic

Changes at RIS update (Update)

☒ No change / ☐ Increase / ☐ Decrease / ☐ Unknown

☐ No available information

Are soil types subject to change as a result of changing hydrological conditions (e.g., increased salinity or acidification)?

☐ Yes / ☒ No

Please provide further information on the soil (optional) (This field is limited to 1000 characters)

Over a geological time-scale, the laying down of a series of sedimentary landscapes has led to the formation of Moreton Bay. Changes to morphological features due to sea-level change, together with geomorphologic processes, such as sedimentation, have resulted in the formation of the present characteristics of the landscape (Hekel et al. 1979; Maxwell 1970). See section 6.1.2 vi for additional information.

#### 4.4.4 Water regime

##### Water permanence

Presence?	Changes at RIS update
Usually permanent water present	No change
Usually seasonal, ephemeral or intermittent water present	No change

##### Source of water that maintains character of the site

Presence?	Predominant water source	Changes at RIS update
Water inputs from rainfall	<input type="checkbox"/>	No change
Water inputs from surface water	<input type="checkbox"/>	No change
Water inputs from groundwater	<input type="checkbox"/>	No change
Marine water	<input type="checkbox"/>	No change

##### Water destination

Presence?	Changes at RIS update
Feeds groundwater	No change
Marine	No change

##### Stability of water regime

Presence?	Changes at RIS update
Water levels fluctuating (including tidal)	No change
Water levels largely stable	No change

Please add any comments on the water regime and its determinants (if relevant). Use this box to explain sites with complex hydrology: *(This field is limited to 2000 characters)*

Water regime is variable across the site's diversity of wetland types. The coastal ocean to the east of Moreton Bay is dominated by the East Australian Current, which allows the tidal exchange of warm tropical water and associated biota, such as tropical fish and coral larvae, into the Bay through its entrances (e.g. North Entrance, South Passage, Jumpinpin, and Gold Coast Seaway). The majority of the exchange occurs through the approximately 15.5 km wide North Passage (Gibbes et al. 2014).

Moreton Bay is a wave-dominated estuary with semi-diurnal tides (Gibbes et al. 2014). The sub-tropical climate is characterised by a distinct seasonal pattern of high summer rainfall leading to large runoff events in short periods of time and occasional floods (Gibbes et al. 2014). During dry periods, a residual clockwise circulation pattern is established within the Bay due to the asymmetry of the flood and ebb tide flows through the four entrances (ibid). This seasonal, event-driven hydrology can result in rapid shifts between two distinct hydrological modes: 1) wind, wave and tidally-dominated oceanic embayment, and 2) freshwater inflow dominated non-marine river valley (ibid).

Six large river systems exert a significant influence on the sediment and water quality characteristics of the Bay; the Brisbane, Pine (North and South), Caboolture, Logan-Albert, Pimpama and Coomera Rivers.

The Brisbane River is the largest river emptying into Moreton Bay and plays an important role in ecosystem function due to the variability in its freshwater discharge. The average annual discharge of the Brisbane River is approximately 69% of the total annual riverine input into Moreton Bay (Stewart et al. 2015). This has the potential to change the hydrographical structure of the Bay, with consequential impacts on the estuarine and marine ecosystem (Yu et al. 2014). Moderate flood events flowing from the Brisbane River have resulted in plumes extending 5.5 km east of the river mouth.

**Connectivity of surface waters and of groundwater** (ECD)

See section 6.1.2 vi for additional information.

**Stratification and mixing regime** (ECD)

See section 6.1.2 vi for additional information.

#### 4.4.5 Sediment regime

☒ Significant erosion of sediments occurs on the site

Changes at RIS update (Update)

☒ No change / ☐ Increase / ☐ Decrease / ☐ Unknown

☒ Significant accretion or deposition of sediments occurs on the site

Changes at RIS update (Update)

☐ No change / ☒ Increase / ☐ Decrease / ☐ Unknown

☒ Significant transportation of sediments occurs on or through the site

Changes at RIS update (Update)

☐ No change / ☒ Increase / ☐ Decrease / ☐ Unknown

☒ Sediment regime is highly variable, either seasonally or inter-annually

Changes at RIS update (Update)

☒ No change / ☐ Increase / ☐ Decrease / ☐ Unknown

☐ Sediment regime unknown

Please provide further information on sediment (optional): *(This field is limited to 1000 characters)*

In the northern and eastern areas of the Bay, sediments are predominantly tidal delta sands. In the southern Bay, sediments are predominantly tidal delta sands with fluvial sands and muds adjacent to the mainland coast. Terrigenous (land-sourced) sediment and nutrient input to the Bay is highly variable over time and space. Episodic high summer rainfall events deliver highly turbid inflows consisting primarily of suspended silts and clays. These have resulted in the western and southern areas of the Bay having the highest sediment mud content. Muddy sediments cover an estimated area of approximately 860 km<sup>2</sup> of the Bay representing over 50 per cent of the total surface sediment area (Lockington et al. 2017). This is more than double the area of the Bay covered in mud compared with the previous estimate in 1970. See section 6.1.2 vi for additional information.

Water turbidity and colour (ECD)

See section 6.1.2 vi for additional information.

Light - reaching wetland (ECD)

See section 6.1.2 vi for additional information.

Water temperature (ECD)

See section 6.1.2 vi for additional information.

#### 4.4.6 Water pH

☒ Acid (pH<5.5)

Changes at RIS update (Update)

☒ No change / ☐ Increase / ☐ Decrease / ☐ Unknown

☒ Circumneutral (pH: 5.5-7.4)

Changes at RIS update (Update)

☒ No change / ☐ Increase / ☐ Decrease / ☐ Unknown

☒ Alkaline (pH>7.4)

Changes at RIS update (Update)

☒ No change / ☐ Increase / ☐ Decrease / ☐ Unknown

☐ Unknown

Please provide further information on pH (optional): *(This field is limited to 1000 characters)*

The pH level varies throughout the site. For the freshwater wetlands, the Oxleyan pygmy perch is thought to be restricted to acidic (pH 4.4 - 6.8) freshwater lakes, pools and small streams with dense, aquatic vegetation (such as emergent and submerged sedges) along the margins (Allen and Ivantsoff 1982; Arthington and Marshall 1993; Arthington 1996; Kuitert et al. 1996; Pusey et al. 2004).

Given the importance of the Moreton Bay area for acid frogs, wallum swamp and lake waters should remain acidic (within the pH range 3-5) while nitrate levels should not exceed 0.7 mg/L (Meyer, E pers. comm. 2008). See section 6.1.2 vi for additional information.

#### 4.4.7 Water salinity

☒ Fresh (<0.5 g/l)

Changes at RIS update (Update)

☒ No change / ☐ Increase / ☐ Decrease / ☐ Unknown

☒ Mixohaline (brackish)/Mixosaline (0.5-30 g/l)

Changes at RIS update (Update)

☒ No change / ☐ Increase / ☐ Decrease / ☐ Unknown

☒ Euhaline/Eusaline (30-40 g/l)

Changes at RIS update (Update)

☒ No change / ☐ Increase / ☐ Decrease / ☐ Unknown

☒ Hyperhaline/Hypersaline (>40 g/l)

Changes at RIS update (Update)

☒ No change / ☐ Increase / ☐ Decrease / ☐ Unknown

☐ Unknown

Please provide further information on salinity (optional): *(This field is limited to 1000 characters)*

Salinity is variable across the wetlands types at the site. The implications of salinity for locally occurring wetlands is largely dependent on the type of wetland, the quantity and quality of flow and/or the wetlands location relative to the freshwater influence. In general terms, freshwater dependent wetlands, such as those in and adjacent to freshwater reaches of watercourses, are those most influenced by freshwater flow patterns. The distribution of mangrove and saltmarsh wetlands are influenced mostly by physiographic features and tidal inundation, however their species composition can be determined by prevailing salinity regimes (BMT WBM 2008) and in some areas influenced by fresh water flows from aquifers (Cox and Specht 2012).

**Dissolved gases in water** (ECD)

Variable

#### 4.4.8 Dissolved or suspended nutrients in water

☒ Eutrophic

Changes at RIS update (Update)

☐ No change / ☐ Increase / ☒ Decrease / ☐ Unknown

☒ Mesotrophic

Changes at RIS update (Update)

☒ No change / ☐ Increase / ☐ Decrease / ☐ Unknown

☒ Oligotrophic

Changes at RIS update (Update)

☒ No change / ☐ Increase / ☐ Decrease / ☐ Unknown

☒ Dystrophic

Changes at RIS update (Update)

☒ No change / ☐ Increase / ☐ Decrease / ☐ Unknown

☐ Unknown

Please provide further information on dissolved or suspended nutrients (optional): *(This field is limited to 1000 characters)*

Nutrients affects the growth of *Lyngbya majuscula* (Cyanobacteria). Increases in bioavailable nutrients (including iron, phosphorus, nitrogen and dissolved organics) as well suitable light, salinity and temperature regimes, and pH can lead to algal blooms (BMT WBM 2008). Within Moreton Bay, the Department of Environment and Science provides updates on cyanobacteria observed by the Queensland Parks and Wildlife Service, local councils and other observers. Results can be accessed via [www.des.qld.gov.au](http://www.des.qld.gov.au)

Within the Ramsar site, acid frogs are typically associated with oligotrophic waters of low pH and changes to water chemistry through nutrient enrichment is a key threat to these species (Meyer et al 2006; Hines and Meyer 2011).

**Dissolved organic carbon** (ECD)

See section 6.1.2 vi for additional information.

**Redox potential of water and sediments** (ECD)

Variable

**Water conductivity** (ECD)

Variable

#### 4.4.9 Features of the surrounding area which may affect the Site

Please describe whether, and if so how, the landscape and ecological characteristics in the area surrounding the Ramsar Site differ from the site itself:

☐ i) broadly similar / ☒ ii) significantly different

*If the surrounding area differs from the Ramsar Site, please indicate how: (Please tick all categories that apply)*

☒ Surrounding area has greater urbanisation or development

☒ Surrounding area has higher human population density

☐ Surrounding area has more intensive agricultural use

☒ Surrounding area has significantly different land cover or habitat types

Please describe other ways in which the surrounding area is different: *(This field is limited to 2000 characters)*

The broader Moreton Bay area is subject to significant impacts due to its proximity to the cities of Brisbane, Logan, the Gold Coast and many other urban centres. Its condition has been modified due to development that has led to the loss of wetlands; dredging and entrance modification including substantial reclamation; urbanisation including the development of canal estates; discharges from industry, sewage and wastewater treatment plants; and natural freshwater flow modification resulting from weirs and dams, water extraction and sand mining. In addition, large estuaries discharge a range of pollutants from urban and rural land uses, such as high sediment and nutrient loads, which has led to chronic adverse impacts on water quality and aquatic ecosystem health in the western and southern sections of Moreton Bay (BMT WBM 2008).

Significant investments have been made to upgrade sewage and wastewater treatment plants in the past decade to reduce nutrient loads and associated phytoplankton blooms in the western embayments. The timing, volume and quality of treated wastewater release is regulated under the Queensland Environmental Protection Act 1994. Water quality and ecosystem health standards are now regulated requiring new development to meet urban stormwater quality management and water sensitive urban design standards. The South East Queensland Healthy Waterways Strategy 2007-2012 has led to the Queensland state government and an alliance of other parties such as local governments, regional natural resource management (NRM) bodies and science providers, regularly monitoring the catchments, rivers, estuaries and coastal areas of Moreton Bay. An annual 'report card' reports on the monitoring results for each catchment and provides an environmental condition grade for both the habitat and water quality (refer section 6.1.2 vi additional information for the 2017 summary report and infographics) ([www.hlw.org.au](http://www.hlw.org.au)).

## 4.5 Ecosystem services

### 4.5.1 Ecosystem services/benefits

*Please select below all relevant ecosystem services/benefits currently provided by the site and indicate their relative importance in the right-hand column.*

#### Provisioning Services

Ecosystem service	Examples	Importance/Extent/Significance
Food for humans	Sustenance for humans (e.g., fish, molluscs, grains)	High
Fresh water	Water for industry	High
Fresh water	Drinking water for humans and/or livestock	High
Genetic materials	Ornamental species (live and dead)	High

#### Regulating Services

Ecosystem service	Examples	Importance/Extent/Significance
Maintenance of hydrological regimes	Groundwater recharge and discharge	High
Erosion protection	Soil, sediment and nutrient retention	High
Pollution control and detoxification	Water purification/waste treatment or dilution	High
Climate regulation	Regulation of greenhouse gases, temperature, precipitation and other climatic processes	High
Climate regulation	Local climate regulation/buffering of change	High
Hazard reduction	Coastal shoreline and river bank stabilization and storm protection	High
Hazard reduction	Flood control, flood storage	High



#### Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Nature observation and nature-based tourism	High
Recreation and tourism	Picnics, outings, touring	High
Recreation and tourism	Water sports and activities	High
Recreation and tourism	Recreational hunting and fishing	High
Spiritual and inspirational	Cultural heritage (historical and archaeological)	High
Spiritual and inspirational	Aesthetic and sense of place values	High
Spiritual and inspirational	Spiritual and religious values	High
Spiritual and inspirational	Contemporary cultural significance, including for arts and creative inspiration, and including existence values	High
Spiritual and inspirational	Inspiration	High
Scientific and educational	Long-term monitoring site	High
Scientific and educational	Important knowledge systems, importance for research (scientific reference area or site)	High
Scientific and educational	Educational activities and opportunities	High
Scientific and educational	Major scientific study site	High

#### Supporting Services

Ecosystem service	Examples	Importance/Extent/Significance
Biodiversity	Supports a variety of all life forms including plants, animals and microorganisms, the genes they contain, and the ecosystems of which they form a part	High
Soil formation	Accumulation of organic matter	High
Soil formation	Sediment retention	High
Nutrient cycling	Carbon storage/sequestration	High
Nutrient cycling	Storage, recycling, processing and acquisition of nutrients	High
Pollination	Support for pollinators	High

Optional text box to provide further information (This field is limited to 2500 characters)

Other ecosystem service(s) not included above: (This field is limited to 2000 characters)

While no detailed and comprehensive (i.e. across all services) Ramsar site specific assessment has been undertaken relating to ecosystem services and their economic value/ranking, given the site's values, it is inferred it is of high significance for those outlined above.

Please make a rough estimate of the approximate number of people who directly benefit from the ecological services provided by this site (estimate at least in orders of magnitude: 10s, 100s, 1000s, 10 000s etc.):

Within the site:

1000000s

Outside the site:

1000000s

Have studies or assessments been made of the economic valuation of ecosystem services provided by this Ramsar Site?

☒ Yes / ☐ No / ☐ Unknown

Where economic studies or assessments of economic valuation have been undertaken at the site, it would be helpful to provide information on where the results of such studies may be located (e.g. website links, citation of published literature): (This field is limited to 2500 characters)

- Literature Review of the Economic Value of Ecosystem Services that Wetlands Provide (including Moreton Bay) - <http://www.environment.gov.au/water/wetlands/publications/literature-review-economic-value-ecosystem-services-wetlands-provide>
- Linking the Ecological and Economic Values of Wetlands: A Case Study of the Wetlands of Moreton Bay PhD Thesis by Clouston, Elizabeth, 2002- <https://www120.secure.griffith.edu.au/rch/file/d2a213de-1c8a-bfbb-47a8-cd985df89109/1/02Whole.pdf>
- Sean Pascoe, Amar Doshi, Quentin Dell, Mark Tonks, Rob Kenyon (2014) "Economic value of recreational fishing in Moreton Bay and the potential impact of the marine park rezoning" in Tourism Management 41 (2014) 53-63, <https://doi.org/10.1016/j.tourman.2013.08.015>

- McPhee, D. P., Mills, M., Hundloe, T. J. A., Buxton, C. D., Knuckey, I., & Williams, K. A. (2008). A participatory and coordinated fishing industry solution to the rezoning of the Moreton Bay Marine Park. Canberra: Fisheries Research and Development Corporation.
- K.A. Williams, D.P. McPhee, T.J.A. Hundloe, C.D. Buxton, I. Knuckey and S. Stone (2009) Regional Impact Assessment for the Moreton Bay Marine Park; FRDC Project No. 2007/053 – 2009

#### 4.5.2 Social and cultural values

*Is the site considered internationally important for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? If so, please describe this importance under one or more of the four following categories. You should not list here any values derived from non-sustainable exploitation or which result in detrimental ecological changes.*

☐ i) the site provides a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland

Description if applicable (This field is limited to 2500 characters)

☐ ii) the site has exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland

Description if applicable (This field is limited to 2500 characters)

☐ iii) the ecological character of the wetland depends on its interaction with local communities or indigenous peoples

Description if applicable (This field is limited to 2500 characters)

☐ iv) relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland

Description if applicable (This field is limited to 2500 characters)

## 4.6 Ecological processes

*This section is not intended for completion as part of a standard RIS, but is included for completeness as part of the agreed format of a 'full' Ecological Character Description (ECD) outlined by Resolution X.15*

Primary production (ECD)

See Section 6.1.2 - for additional information

Nutrient cycling (ECD)

Occurring, variable

Carbon cycling (ECD)

Occurring, variable

Animal reproductive productivity (ECD)

Occurring, variable

Vegetational productivity, pollination, regeneration processes, succession, role of fire, etc. (ECD)

Occurring, variable

Notable species interactions, including grazing, predation, competition, diseases and pathogens (ECD)

Occurring, variable

Notable aspects concerning animal and plant dispersal (ECD)

Occurring, variable

Notable aspects concerning migration (ECD)

See Section 6.1.2 - for additional information

Pressures and trends concerning any of the above, and/or concerning ecosystem integrity (ECD)

See Section 6.1.2 - for additional information

## How is the Site managed?

### 5.1 Land tenure and responsibilities (Managers)

#### 5.1.1 Land tenure/ownership

Please specify if this category applies to the Ramsar Site, to the surrounding area or to both, by ticking the relevant option(s).

##### Public ownership

Category	Within the Ramsar Site	In the surrounding area
Provincial/region/state government	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
National/Federal government	<input type="checkbox"/>	<input type="checkbox"/>
Local authority, municipality, (sub)district, etc.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Public land (unspecified)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Other public ownership	<input type="checkbox"/>	<input type="checkbox"/>

##### Private ownership

Category	Within the Ramsar Site	In the surrounding area
Commercial (company)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other types of private/individual owner(s)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

##### Other

Category	Within the Ramsar Site	In the surrounding area
Commoners/customary rights	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Provide further information on the land tenure / ownership regime (optional): (This field is limited to 1000 characters)

Moreton Bay Marine Park is a management layer, tenure is state land/waters as identified above. Moreton Bay Marine Park covers a total of 3,400 km<sup>2</sup> extending seawards to the limit of Queensland waters and incorporates nearly all of the Ramsar site.

Land areas above the high water mark within the Ramsar site are largely State or local government owned lands including national parks, conservation parks, reserves, esplanades and unallocated State land. Areas of freehold land in the Ramsar site are held by local government.

Within the Ramsar site, active Native Title claims exist to Moreton Island (Gnoorganbin) (Quandamooka People #4), western Moreton Bay (Quandamook) waters and areas of the mainland (Quandamooka Coast Claim), Bribie Island and inland waters (Kabi Kabi First Nation) and mainland (Kabi Kabi Undambi Area Claim) areas).

See section 6.1.2 vi for additional information.

### 5.1.2 Management authority

Please list the local office / offices of any agency or organization responsible for managing the site: *(This field is limited to 1000 characters)*

Queensland State Government

Queensland Department of Environment and Science – [www.des.qld.gov.au](http://www.des.qld.gov.au)

The Moreton Bay Marine Park, adjacent National Parks, Conservation Parks and Recreation Areas are managed by the Queensland Department of Environment and Science, Queensland Parks and Wildlife Service (QPWS).

Queensland Department of Agriculture and Fisheries – [www.daf.qld.gov.au](http://www.daf.qld.gov.au)

Queensland Department of Transport and Main Roads – [www.tmr.qld.gov.au](http://www.tmr.qld.gov.au)

Queensland Department of Natural Resources, Mines and Energy – [www.dnrm.qld.gov.au](http://www.dnrm.qld.gov.au)

Local Governments

Sunshine Coast Council – [www.sunshinecoast.qld.gov.au](http://www.sunshinecoast.qld.gov.au)

Moreton Bay Regional Council – [www.moretonbay.qld.gov.au](http://www.moretonbay.qld.gov.au)

Brisbane City Council – [www.brisbane.qld.gov.au](http://www.brisbane.qld.gov.au)

Redland City Council – [www.redland.qld.gov.au](http://www.redland.qld.gov.au)

City of Gold Coast – [www.goldcoast.qld.gov.au](http://www.goldcoast.qld.gov.au)

Quandamooka Yoolooburrabee Aboriginal Corporation – [www.qyac.net.au](http://www.qyac.net.au)

Port of Brisbane – [www.portbris.com.au](http://www.portbris.com.au)

Gold Coast Waterways Authority - [www.gcwa.qld.gov.au](http://www.gcwa.qld.gov.au)

Provide the name and title of the person or people with responsibility for the wetland:

Manager, Wetlands Team, Queensland Department of Environment and Science

Postal address: *(This field is limited to 1000 characters)*

Queensland Department of Environment and Science

GPO Box 2454

Brisbane QLD 4001

E-mail address: *(The online RIS only accepts valid e-mail addresses, e.g. example@mail.com )*

[info@des.gov.au](mailto:info@des.gov.au)

## 5.2 Ecological character threats and responses (Management)

### 5.2.1 Factors (actual or likely) adversely affecting the Site's ecological character

Please specify if this category applies to the Ramsar Site, to the surrounding area or to both, by ticking the relevant option(s).

#### Human settlements (non agricultural)

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Housing and urban areas	unknown impact	unknown impact	<input type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Commercial and industrial areas	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Tourism and recreation areas	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

#### Water regulation

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Drainage	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Water abstraction	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Dredging	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Water releases	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Canalisation and river regulation	unknown impact	unknown impact	<input type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

#### Agriculture and aquaculture

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Annual and perennial non-timber crops	unknown impact	unknown impact	<input type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Wood and pulp plantations	unknown impact	unknown impact	<input type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

Livestock farming and ranching	unknown impact	unknown impact	<input type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Marine and freshwater aquaculture	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

## Energy production and mining

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Mining and quarrying	unknown impact	unknown impact	<input type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

## Transportation and service corridors

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Roads and railroads	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Utility and service lines (e.g., pipelines)	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Shipping lanes	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Aircraft flight paths	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

## Biological resource use

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Fishing and harvesting aquatic resources	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

## Human intrusions and disturbance



Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Recreational and tourism activities	unknown impact	unknown impact	[x]	No change	[x]	No change

## Natural system modifications

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Fire and fire suppression	unknown impact	unknown impact	[x]	No change	[x]	No change
Dams and water management/use	unknown impact	unknown impact	[ ]	No change	[x]	No change
Vegetation clearance/ land conversion	unknown impact	unknown impact	[x]	No change	[x]	No change

## Invasive and other problematic species and genes

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Invasive non-native/ alien species	unknown impact	unknown impact	[x]	No change	[x]	No change

## Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Household sewage, urban waste water	unknown impact	unknown impact	[x]	No change	[x]	No change
Industrial and military effluents	unknown impact	unknown impact	[ ]	No change	[x]	No change
Agricultural and forestry effluents	unknown impact	unknown impact	[x]	No change	[x]	No change

Garbage and solid waste	unknown impact	unknown impact	[x]	No change	[x]	No change
Excess heat, sound, light	unknown impact	unknown impact	[x]	No change	[x]	No change

#### Geological events

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes

#### Climate change and severe weather

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Habitat shifting and alteration	unknown impact	unknown impact	[x]	No change	[x]	No change
Droughts	unknown impact	unknown impact	[x]	No change	[x]	No change
Temperature extremes	unknown impact	unknown impact	[x]	No change	[x]	No change
Storms and flooding	unknown impact	unknown impact	[x]	No change	[x]	No change

Please describe any other threats (optional): (This field is limited to 3000 characters)

A comprehensive site specific assessment of impacts to rank them has not been undertaken. As such, unknown has been used above as the option to represent not formally assessed.

Illegal collection or interference with native flora and fauna.

Highly regulated mosquito control programs operate within the site.

Jamella leaf hopper (*Jamella australiae*) outbreaks and myrtle rust (*Puccinia psidii*) fungal disease have been noted.

### 5.2.2 Legal conservation status

Please list any other relevant conservation status, at global, regional or national level and specify the boundary relationships with the Ramsar Site:

#### Global legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site

## Regional (international) legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Other international designation	East Asian-Australasian Flyway Network site EAAF013	<a href="http://eaaflyway.net">http://eaaflyway.net</a>	whole

## National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Declared Fish Habitat Area	Coomera (FHA-023)	<a href="https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html">https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html</a>	partly
Declared Fish Habitat Area	Peel Island (FHA-10); Pumicestone Channel (FHA-011); Hays Inlet (FHA-012); Deception Bay (FHA-013); Kippa-Ring (FHA-014); Moreton Banks (FHA-015); Coombabah (FHA-16); Myora–Amity Banks (FHA-017); Jumpinpin-Broadwater (FHA-021); Pimpama (FHA-022)	<a href="https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html">https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html</a>	partly
State Protected Area (QLD)	Beachmere Conservation I Park	<a href="https://www.npsr.qld.gov.au/parks/">https://www.npsr.qld.gov.au/parks/</a>	partly
State Protected Area (QLD)	Beerburum East State Forest	<a href="https://www.npsr.qld.gov.au/parks/">https://www.npsr.qld.gov.au/parks/</a>	partly
State Protected Area (QLD)	Beerwah State Forest	<a href="https://www.npsr.qld.gov.au/parks/">https://www.npsr.qld.gov.au/parks/</a>	partly
State Protected Area (QLD)	Bird Island Conservation Park	<a href="https://www.npsr.qld.gov.au/parks/">https://www.npsr.qld.gov.au/parks/</a>	whole
State Protected Area (QLD)	Bribie Island National Park	<a href="https://www.npsr.qld.gov.au/parks/">https://www.npsr.qld.gov.au/parks/</a>	partly
State Protected Area (QLD)	Bribie Island State Forest	<a href="https://www.npsr.qld.gov.au/parks/">https://www.npsr.qld.gov.au/parks/</a>	partly
State Protected Area (QLD)	Buckleys Hole Conservation Park	<a href="https://www.npsr.qld.gov.au/parks/">https://www.npsr.qld.gov.au/parks/</a>	partly
State Protected Area (QLD)	Bullock Creek Conservation Park	<a href="https://www.npsr.qld.gov.au/parks/">https://www.npsr.qld.gov.au/parks/</a>	partly

State Protected Area (QLD)	Carbrook Wetlands Conservation Park 2	<a href="https://www.npsr.qld.gov.au/parks/">https://www.npsr.qld.gov.au/parks/</a>	partly
State Protected Area (QLD)	Coomabah Lake Conservation Park	<a href="https://www.npsr.qld.gov.au/parks/">https://www.npsr.qld.gov.au/parks/</a>	partly
State Protected Area (QLD)	Deception Bay Conservation Park	<a href="https://www.npsr.qld.gov.au/parks/">https://www.npsr.qld.gov.au/parks/</a>	partly
State Protected Area (QLD)	Goat Island Conservation Park	<a href="https://www.npsr.qld.gov.au/parks/">https://www.npsr.qld.gov.au/parks/</a>	whole
State Protected Area (QLD)	Hays Inlet Conservation Park 1 & 2	<a href="https://www.npsr.qld.gov.au/parks/">https://www.npsr.qld.gov.au/parks/</a>	whole
State Protected Area (QLD)	King Island Conservation Park	<a href="https://www.npsr.qld.gov.au/parks/">https://www.npsr.qld.gov.au/parks/</a>	whole
State Protected Area (QLD)	Main Beach Conservation Park	<a href="https://www.npsr.qld.gov.au/parks/">https://www.npsr.qld.gov.au/parks/</a>	whole
State Protected Area (QLD)	Moreton Bay Marine Park	<a href="https://www.npsr.qld.gov.au/parks/">https://www.npsr.qld.gov.au/parks/</a>	partly
State Protected Area (QLD)	Moreton Island National Park	<a href="https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html">https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html</a>	partly
State Protected Area (QLD)	Mud Island Conservation Park	<a href="https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html">https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html</a>	partly
State Protected Area (QLD)	Myora Conservation Park	<a href="https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html">https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html</a>	partly
State Protected Area (QLD)	Naree Budjong Djara Conservation Park	<a href="https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html">https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html</a>	partly
State Protected Area (QLD)	Naree Budjong Djara National Park	<a href="https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html">https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html</a>	whole
State Protected Area (QLD)	Ningi Creek Conservation Park	<a href="https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html">https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html</a>	partly
State Protected Area (QLD)	Pumicestone National Park	<a href="https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html">https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html</a>	partly
State Protected Area (QLD)	South Stradbroke Island Conservation Park	<a href="https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html">https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html</a>	partly
State Protected Area (QLD)	Southern Moreton Bay Islands National Park	<a href="https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html">https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html</a>	partly
State Protected Area (QLD)	St Helena Island National Park	<a href="https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html">https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html</a>	whole

State Protected Area (QLD)	Teerk Roo Ra Conservation Park	<a href="https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html">https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html</a>	partly
State Protected Area (QLD)	Teerk Roo Ra National Park	<a href="https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html">https://www.npsr.qld.gov.au/managing/habitat-areas/area-plans.html</a>	partly

## Non-statutory designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Important Bird Area	KBA – Key Biodiversity Area- Moreton Bay & Pumicestone Passage	<a href="http://datazone.birdlife.org/site/factsheet/23545">http://datazone.birdlife.org/site/factsheet/23545</a>	partly
Important Bird Area	Moreton Bay & Pumicestone Passage	<a href="http://birdlife.org.au/documents/OTHPUB-IBA-suppl.pdf">http://birdlife.org.au/documents/OTHPUB-IBA-suppl.pdf</a>	partly
Other non-statutory designation	Moreton Bay hope spot	<a href="https://mission-blue.org/2017/08/citizen-scientist-nurture-the-moreton-bay-hope-spot/">https://mission-blue.org/2017/08/citizen-scientist-nurture-the-moreton-bay-hope-spot/</a>	partly
Other non-statutory designation			

## 5.2.3 IUCN protected areas categories (2008)

- ☐ Ia Strict Nature Reserve
- ☐ Ib Wilderness Area: protected area managed mainly for wilderness protection
- ☒ II National Park: protected area managed mainly for ecosystem protection and recreation
- ☐ III Natural Monument: protected area managed mainly for conservation of specific natural features
- ☒ IV Habitat/Species Management Area: protected area managed mainly for conservation through management intervention
- ☒ V Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation
- ☐ VI Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems

## 5.2.4 Key conservation measures

## Legal protection

Measures	Status
Legal protection	Implemented

## Habitat

Measures	Status
----------	--------

Catchment management initiatives/controls	Partially implemented
Improvement of water quality	Partially implemented
Habitat manipulation/enhancement	Partially implemented
Hydrology management/restoration	Partially implemented
Re-vegetation	Partially implemented
Soil management	Partially implemented

#### Species

Measures	Status
Control of invasive alien plants	Partially implemented
Threatened/rare species management programmes	Partially implemented
Control of invasive alien animals	Partially implemented

#### Human Activities

Measures	Status
Management of water abstraction/takes	Partially implemented
Regulation/management of wastes	Partially implemented
Regulation/management of recreational activities	Partially implemented
Communication, education, and participation and awareness activities	Partially implemented
Research	Partially implemented

Livestock management/exclusion (excluding fisheries)	Partially implemented
Fisheries management/regulation	Partially implemented

Other: (This field is limited to 3000 characters)

In Australia, the ecological character of Ramsar sites is protected as a Matter of National Environmental Significance (MNES) under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).  
\*The measures outlined above as partially implemented are ongoing.

### 5.2.5 Management planning

Is there a site-specific management plan for the site?

Yes<sup>6</sup>

Is the management plan/planning implemented?

☒ Yes / ☐ No

The management plan covers

Part of Ramsar Site<sup>7</sup>

Is the management plan currently subject to review and update?

☒ Yes / ☐ No

Has a management effectiveness assessment been undertaken for the site?

☐ Yes / ☒ No

Please give link to site-specific plan or other relevant management plan if this is available via the Internet or upload it in section 'Additional material': (This field is limited to 500 characters)

Management plans exist for the island protected areas on Bribie Island, Moreton Island and South Stradbroke Island. The Moreton Bay Marine Park Zoning Plan is not a management plan but provides guidance on use. Local Governments undertake catchment action planning and management planning for reserves. See section 6.1.2 vi for additional information. Links: to management plans and statements at: <https://parks.des.qld.gov.au/managing/plans-strategies/>

If the site is a formal transboundary site as indicated in section Data and location > Site location, are there shared management planning processes with another Contracting Party?

☐ Yes / ☒ No

Please indicate if a Ramsar centre, other educational or visitor facility, or an educational or visitor programme is associated with the site: (This field is limited to 1000 characters)

There are a number of educational and visitor facilities associated with the site.

Refer section 5.1 management authorities web pages and  
<https://www.npsr.qld.gov.au/parks/moreton-bay/>  
<https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/ramsar-wetland-moreton-bay/>

URL of site-related webpage (if relevant):

<https://www.npsr.qld.gov.au/parks/moreton-bay/> <https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/ramsar-wetland-moreton-bay/>

### 5.2.6 Planning for restoration

<sup>6</sup> No | Yes | In preparation

<sup>7</sup> All of Ramsar Site | Part of Ramsar Site

Is there a site-specific restoration plan?

No need identified<sup>8</sup>

Has the plan been implemented?

☐ Yes / ☒ No

The restoration plan covers:

No need identified<sup>9</sup>

Is the plan currently being reviewed and updated?

☐ Yes / ☒ No

Where the restoration is being undertaken to mitigate or respond to a threat or threats identified in this RIS, please indicate it / them: *(This field is limited to 1000 characters)*

Further information *(This field is limited to 2500 characters)*

There are restoration activities undertaken by the range of site managers that oversee the site - refer to Section 5.1

Additionally, non-government organisations and natural resource management groups undertake a range of restoration activities that contribute to the protection and enhancement of site values. (including through national, state, local government and NGO programs).

### 5.2.7 Monitoring implemented or proposed

Monitoring	Status
Water quality	Implemented
Plant community	Implemented
Plant species	Implemented
Animal species (please specify)	Implemented
Birds	Implemented

Please indicate other monitoring activities:

*(This field is limited to 3000 characters)*

A comprehensive list of monitoring programs relating to aquatic ecosystems, including those underway in the Ramsar site is provided on [www.wetlandinfo.des.qld.gov.au](http://www.wetlandinfo.des.qld.gov.au).

<sup>8</sup> No need identified | No; the site has already been restored | No; but restoration is needed | No; but a plan is being prepared | Yes; there is a plan

<sup>9</sup> All of Ramsar Site | Part of Ramsar Site



## Additional material

### 6.1 Additional reports and documents

#### 6.1.1 Bibliographical references

(This field is limited to 3000 characters)

See section 6.1.2 vi for the full bibliography.

#### 6.1.2 Additional reports and documents

i. taxonomic lists of plant and animal species occurring in the site (see section 4.3)

**-UPLOAD via online form-**

ii. a detailed Ecological Character Description (ECD) (in a national format)

**-UPLOAD via online form-**

iii. a description of the site in a national or regional wetland inventory

**-UPLOAD via online form-**

iv. relevant Article 3.2 reports

**-UPLOAD via online form-**

v. site management plan

**-UPLOAD via online form-**

vi. other published literature

**-UPLOAD via online form-**

*Please note that any documents uploaded here will be made publicly available.*

#### 6.1.3 Photograph(s) of the Site

Please provide at least one photograph of the site:

File	Copyright holder	Date on which the picture was taken	Caption
files/42194278/pictures/Blue Lake Nth Straddie AS.JPG	Department of Environment and Science	2018	Blue Lake, Moreton Bay Ramsar Site
files/42194278/pictures/Deadman's Beach Nth Straddie AS.JPG	Department of Environment and Science	2018	North Stradbroke Island, Moreton Bay Ramsar Site
files/42194278/pictures/Litoria cooloolensis AS.JPG	Department of Environment and Science	2018	Cooloola Sedgefrog (Litoria cooloolensis), Moreton Bay Ramsar Site
files/42194278/pictures/Flinders Beach Nth Straddie AS (2).jpg	Department of Environment and Science	2018	North Stradbroke Island, Moreton Bay Ramsar Site
files/42194278/pictures/Flinders Beach Nth Straddie AS.JPG	Department of Environment and Science	2018	North Stradbroke Island, Moreton Bay Ramsar Site
files/42194278/pictures/Main Beach North Straddie AS.JPG	Department of Environment and Science	2018	North Stradbroke Island, Moreton Bay Ramsar Site

--	--	--	--

☒ I certify that I am the photographer, the valid holder of rights over the photograph(s), or an authorized representative of the organization which is the valid holder of rights over the photograph(s), and I hereby assign an irrevocable, perpetual and royalty-free right to use, reproduce, edit, display, transmit, prepare derivative works of, modify, publish, affix logos to, and otherwise make use of the submitted photograph(s) in any way, to the Ramsar Convention Secretariat, its affiliates and partners, for non-commercial purposes in conjunction with the mission of the Ramsar Convention. This use includes, but is not limited to, internal and external publication and materials, presentation on the websites of the Ramsar Convention or any affiliated body, and any and all other communication channels with copyright attributed to the holder in all published forms. The full accuracy of all data submitted rests with the submitter, or organization submitting the photograph(s). In submitting, I hereby agree to the aforementioned terms, personally or on behalf of the organization of which I am an authorized official, certifying that the Ramsar Convention Secretariat, its affiliates and partners are explicitly held harmless for any and all costs, expenses, or damages arising from use of the submitted photograph(s) and any additional information provided.

#### 6.1.4 Designation letter and related data

Designation letter\*

**-UPLOAD via online form-**

*Please upload a letter of designation from the Ramsar Administrative Authority. This letter must clearly state that the wetland is being designated for inclusion in the Ramsar List and specify the formal date of designation wished. The letter can be uploaded in two formats: Word document (doc); pdf Strategic Framework: 408. The RIS for a newly designated Site (or an update to the RIS for a previously designated site) must be officially transmitted to the Secretariat by the Ramsar Administrative Authority (AA) of the Contracting Party concerned, with a letter clearly stating that the wetland is being designated for inclusion in the Ramsar List and specifying the formal date of designation if wished. 413. The date of designation of a Ramsar Site is that indicated or requested by the Ramsar Administrative Authority (AA). The designation date required should be indicated in the designation letter from the AA to the Secretariat that accompanies the RIS. 414. If no designation date is indicated to the Secretariat, the Secretariat assigns the date of the designation letter from the Administrative Authority as the designation date of the site. 415. If, following the receipt and review of the RIS by the Secretariat (see below), a significant time-period elapses before any problems with the RIS content are resolved with the Administrative Authority, the Secretariat may propose that, with the agreement of the AA, the date of designation is that on which the RIS is finalised.*

Transboundary Designation letter

**-UPLOAD via online form-**

Date of Designation

1993-10-22

Number of certificates wished *(The online RIS only accepts numeric values)*

0