



Ramsar Information Sheet

Published on 1 December 2023

Update version, previously published on : 1 January 1999

Australia Moreton Bay



Designation date	22 October 1993
Site number	631
Coordinates	27°23'20"S 153°19'14"E
Area	120 639,00 ha

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.

1 - Summary

Summary

The Moreton Bay Site (Wetland of International Importance) 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 squared kilometres (km²). The bay is approximately 110 kilometres (km) long from north to south and 35 km at its widest east to west axis.

The Site meets all nine criteria to be designated as a Wetland 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. It 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, 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.

2 - Data & location

2.1 - Formal data

2.1.1 - Name and address of the compiler of this RIS

Responsible compiler

Institution/agency	Department of Environment and Science, Queensland
Postal address	GPO Box 2454, Brisbane, Queensland, 4001 Australia

National Ramsar Administrative Authority

Institution/agency	Department of Climate Change, Energy, the Environment and Water
Postal address	GPO Box 3090 Canberra, ACT, 2601 Australia

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

From year	<input type="text" value="1999"/>
To year	<input type="text" value="2018"/>

2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)	Moreton Bay
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2.1.4 - Changes to the boundaries and area of the Site since its designation or earlier update

(Update) A. Changes to Site boundary	Yes <input checked="" type="radio"/> No <input type="radio"/>
(Update) The boundary has been delineated more accurately	<input checked="" type="checkbox"/>
(Update) The boundary has been extended	<input type="checkbox"/>
(Update) The boundary has been restricted	<input type="checkbox"/>
(Update) B. Changes to Site area	the area has increased
(Update) The Site area has been calculated more accurately	<input checked="" type="checkbox"/>
(Update) The Site has been delineated more accurately	<input type="checkbox"/>
(Update) The Site area has increased because of a boundary extension	<input type="checkbox"/>
(Update) The Site area has decreased because of a boundary restriction	<input type="checkbox"/>
(Update) For secretariat only. This update is an extension	<input type="checkbox"/>

2.1.5 - Changes to the ecological character of the Site

(Update) 6b i. Has the ecological character of the Ramsar Site (including applicable Criteria) changed since the previous RIS?	No
(Update) Optional text box to provide further information	Not applicable

2.2 - Site location

2.2.1 - Defining the Site boundaries

b) Digital map/image
<1 file(s) uploaded>

Former maps	0
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Boundaries description

The 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 Site, it 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

Refer to the boundary description (attached under section 6.1.2) for a more detailed description of the Site boundary.

2.2.2 - General location

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

The Site is in Queensland, Australia. Five local government areas intersect the Ramsar site: Sunshine Coast Regional Council; Moreton Bay Regional Council; Brisbane City Council; Redland City Council; City of Gold Coast.

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

2.2.4 - Area of the Site

Official area, in hectares (ha): 120639

Area, in hectares (ha) as calculated from GIS boundaries 120638.969

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Marine Ecoregions of the World (MEOW)	Temperate Australasia; East Central Australian Shelf (55), Tweed-Moreton (202)
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)
Freshwater Ecoregions of the World (FEOW)	Eastern Coastal Australia (807) (FEOW)
Other scheme (provide name below)	Australian Hydrological Geospatial Fabric – Topographic Drainage Divisions and River Regions; regions listed below.

Other biogeographic regionalisation scheme

- 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-aust ralia-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>)

3 - Why is the Site important?

3.1 - Ramsar Criteria and their justification

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

Moreton Bay is representative of sub-tropical coastal wetland systems of the Moreton Basin biogeographic region of SE Queensland, and the Tweed-Moreton marine meso-scale bioregion (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 major coastal system containing a diversity of wetland 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 influence 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). Hydrology 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; e.g., 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'. Wallum habitats 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). They 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 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. Hotspots have been identified in the western embayments and near the Southern Bay Islands and mangroves (ibid); however, the source of the discharge is difficult to determine as the fresh and recirculated marine components are often well mixed (Sadat-Noori et al. 2016).

Hydrological services provided

Moreton Bay provides numerous services to locals and visitors to south east Queensland. 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 \$24-30 million (m) (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).

Other ecosystem services provided

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 Site include the importance of the Site to Traditional Owners. The Site provides spiritual and aesthetic services, improving human wellbeing. It 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 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

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 broad-scale habitats 2008 and Regional ecosystem mapping (version 10). When compared to the Convention on Wetlands' habitat classification, it is clear that the Moreton Bay contains a wide diversity of wetland types (with up to 23 types (one human-made)), including several that are considered rare within the bioregion.

Criterion 2 : Rare species and threatened ecological communities

The Site supports a high diversity of threatened flora and fauna species, and ecological communities listed nationally under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), and/ or internationally under the IUCN Redlist. These include:

Plant species:

- swamp daisy, *Olearia hygrophila* (EPBC–endangered)
- lesser swamp orchid, *Phaius australis* (EPBC–endangered)
- yellow swamp orchid, *Phaius australis bernaysii* (EPBC–endangered)
- stinking cryptocarya, *Cryptocarya foetida* (EPBC–vulnerable)

The swamp orchids are frequently encountered on the bay islands but rarely on the mainland.

Shorebirds:

- eastern curlew, *Numenius madagascariensis* (EPBC—critically endangered, IUCN—endangered)
- curlew sandpiper, *Calidris ferruginea* (EPBC—critically endangered, IUCN—near threatened)
- great knot, *Calidris tenuirostris* (EPBC—critically endangered, IUCN—endangered)
- red knot, *Calidris canutus* (EPBC—endangered, IUCN—near threatened)
- lesser sand plover, *Charadrius mongolus* (EPBC—endangered)
- bar-tailed godwit, *Limosa lapponica* (EPBC—vulnerable, IUCN—near threatened)
- greater sand plover, *Charadrius leschenaultii* (EPBC—endangered)

Marine turtles:

- hawksbill, *Eretmochelys imbricata* (EPBC—vulnerable, IUCN—critically endangered)
- leatherback, *Dermochelys coriacea* (EPBC—endangered, IUCN—vulnerable)
- olive ridley, *Lepidochelys olivacea* (EPBC—endangered, IUCN—vulnerable)
- loggerhead, *Caretta caretta* (EPBC—endangered, IUCN—vulnerable)
- green, *Chelonia mydas* (EPBC—vulnerable, IUCN—endangered)
- flatback, *Natator depressus* (EPBC—vulnerable, IUCN—data deficient)

Optional text box to provide further information

Mammals:

- humpback whale, *Megaptera novaeangliae* (EPBC—vulnerable)
- southern right whale, *Eubalaena australis* (EPBC—endangered)
- dugong, *Dugong dugon* (IUCN—vulnerable)
- Australian humpback dolphin, *Sousa sahulensis* (IUCN—vulnerable)

Fish:

- grey nurse shark, *Carcharias taurus* (EPBC—critically endangered, IUCN—critically endangered),
- great white shark, *Carcharodon carcharias* (EPBC—vulnerable)
- manta ray, *Mobula alfredi* (IUCN – vulnerable)
- Oxleyan pygmy perch (*Nannoperca oxleyana*) (EPBC—endangered)

Frogs:

- wallum froglet, *Crinia tinnula* (IUCN – vulnerable)
- wallum sedgefrog, *Litoria olongburensis* (EPBC—vulnerable, IUCN—vulnerable)
- Cooloola sedgefrog, *Litoria cooloolensis* (IUCN—endangered)
- wallum rocketfrog, *Litoria freycineti* (IUCN—vulnerable)

Other species:

- water mouse, *Xeromys myoides* (EPBC—vulnerable, IUCN—vulnerable).
- swamp crayfish, *Tenuibranchiurus glypticus* (IUCN—endangered)
- Illidge's ant-blue butterfly, *Acrodipsas illidgei* (IUCN—endangered)

Ecological communities:

- Subtropical and Temperate Coastal Saltmarsh (EPBC—vulnerable)
- Lowland Rainforest of Subtropical Australia (EPBC—critically endangered)
- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland (EPBC—endangered)
- Littoral Rainforest and Coastal Vine Thickets of Eastern Australia (EPBC—critically endangered)

Criterion 3 : Biological diversity

Justification

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 Site. The 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 oriarus*) occurs within the 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 sections 3.2, 3.3, 4.3 and 6.1.2 vi for additional information.

Criterion 4 : Support during critical life cycle stage or in adverse conditions

The Site supports habitats that are important at critical stages in the life cycles of numerous wetland-dependent species, including at least 28 migratory shorebirds. Each summer, more than 33,000 migratory shorebirds spend the non-breeding season (approx. Nov-Mar), and part of their northward and southward migratory journeys in Moreton Bay. A subset of the non-breeding population (typically sub-adult birds not yet ready to reproduce) 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 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 site of the East Asian Australasian Flyway Network (site code EAAF013). The Site also supports a range of other waterbird species (QWSG 2017), providing important breeding habitat for the resident Australian pied oystercatcher (*Haematopus longirostris*), beach stone-curlew (*Esacus magnirostris*) and Little tern (*Sternula albifrons*), as well as raptors, such as the eastern osprey (*Pandion cristatus*).

Optional text box to provide further information

The Site provides important nursery grounds for a range of marine fish, prawns and crabs, as well as supporting the entire life cycle of 4 acid frog species, water mouse (*Xeromys myoides*), Illidge's ant blue butterfly (*Acrodipsas illidgei*) and Oxleyan pygmy perch (*Nannoperca oxleyana*).

The Site is also an important feeding area for green (*Chelonia mydas*) and loggerhead (*Caretta caretta*) turtles, providing suitable nesting areas 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). It marks their most southerly feeding and breeding grounds. It also supports the most southerly resident population of the Australian humpback dolphin.

The Site provides habitat features for migratory marine species including grey nurse shark (*Carcharias taurus*) (IUCN – vulnerable). Both species use mating sites in large aggregations during the warmer summer months near the Site (Dudgeon et al. 2013; Smith et al. 2015).

See table 3.3 and section 6.1.2 vi for additional information.

Criterion 5 : >20,000 waterbirds

Overall waterbird numbers	66,340
Start year	2013
End year	2017
Source of data:	QWSG 2017; Hansen et al. 2016

Optional text box to provide further information

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).

Estimated populations at the Site from 2013-2017:

- Migratory shorebirds (28 species): 33,929
- Non-migratory shorebirds (15 species): 3,758
- Other waterbirds (59 species): 28, 653.

Criterion 6 : >1% waterbird population

Optional text box to provide further information

IMPORTANT NOTE FROM THE SECRETARIAT OF THE CONVENTION ON WETLANDS:
 10 species of birds are marked for Criterion 6 in Section 3.3. Out of the 10, only *Charadrius bicinctus* and *Calidris acuminata* do not fulfil Criterion 6 using Waterbird Population Estimates (WPE) 1% threshold value provided by Wetland International. Except for *Haematopus longirostris*, occurrence(%) for all species in Section 3.3 have been calculated using the 1% threshold value from an alternate source, Hansen et al. (2016). Although usage of alternative sources for Criterion 6 was approved at COP14 (Resolution XIV.18), the guidance to use such sources is under preparation by the Scientific Technical and Review Panel (STRP) of the Convention. Once the guidance on the usage of alternative sources has been prepared, the application of Criterion 6 may change to some extent in the next update for this Site.

OPTIONAL INFORMATION FROM THE CONTRACTING PARTY:

The following species have been recorded at the Site at 1% or greater of their flyway population, which is based on the Wetlands International Waterbird Population Estimates (WPE) and Hansen et al. (2016) revised East Asian-Australasian Flyway population estimates:

- bar-tailed godwit (*Limosa lapponica*) (Hansen, WPE)
- curlew sandpiper (*Calidris ferruginea*) (Hansen, WPE)
- eastern curlew (*Numenius madagascariensis*) (Hansen, WPE)
- grey-tailed tattler (*Tringa brevipes*) (Hansen, WPE)
- red-necked stint (*Calidris ruficollis*) (Hansen, WPE)
- whimbrel (*Numenius phaeopus*) (Hansen, WPE)
- sharp-tailed sandpiper (*Calidris acuminata*) (Hansen)
- lesser sand plover (*Charadrius mongolus*) (Hansen, WPE)
- double-banded plover (*Charadrius bicinctus*) (Hansen)

The Site also supports >1% of the Australian population of the Australian pied oystercatcher (*Haematopus longirostris*), which is a resident species (WPE).

Based on the WPE, the Site supports 0.97% of the flyway population of the sharp-tailed sandpiper and 0.5% of the flyway population of the double-banded plover. These figures should be used with caution, as the WPE is based on older data, which does not reflect recent population declines across the flyway. 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 (threatened species listing). The QWSG surveys (see Criterion 5 above) include counts at high tide at the Port of Brisbane located adjacent to the Site. These shorebird species are likely to be foraging in the surrounding area, including the 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 Site.

Criterion 7 : Significant and representative fish

Justification

The Site supports diverse fish fauna due to the wide variety of habitats within and adjacent to it, including mangroves, saltmarsh, seagrass, sand/ 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).

Two interacting zones of fish diversity exist in Moreton Bay; an inshore estuarine-dominated system and an eastern marine-dominated system (Davie and Hooper 1998 in Tibbets et al. 1998). Moreton Bay is a meeting point for tropical northern and temperate southern fauna which, combined with the diversity of habitats, has resulted in high faunal diversity. Approximately 750 fish species are recorded in the Bay (Johnson 1999, Johnson 2010). There are 27+ species of fish that only 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). Major 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 other species of mullet, bream, whiting, tailor, spinefoot (rabbitfish), garfish, baitfish, flathead, dart, snapper and trevally (QFish 2018). Popular species for recreational fisheries include sand whiting (*Sillago ciliata*) and dusky flathead (*Platycephalus fuscus*) (Vargas-Fonseca et al. 2016; Henderson et al. 2017).

3,000+ marine invertebrate species have been recorded in the Bay (Davie and Hooper in Tibbets et al 1998; Johnson 1999). High value fisheries include 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 threatened fish including Oxleyan pygmy perch (*Nannoperca oxleyana*) (EPBC—endangered). This species, and other freshwater species recorded within the Site such as crayfish (*Tenuibranchiurus glypticus*) (IUCN-endangered), are coastal wetland habitat specialists, often geographically isolated, leading to high genetic divergence (Dawkins et al. 2010; Hughes et al. 1999; Page et al. 2004; 2012; Mather et al. 2015).

Criterion 8 : Fish spawning grounds, etc.

Justification

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).

Other 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).

Criterion 9 : >1% non-avian animal population

Optional text box to provide further information

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 Table 3.3 and Section 6.1.2 vi for additional information on these species, including a justification for the 1% criterion.

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

Phylum	Scientific name	Criterion 2	Criterion 3	Criterion 4	IUCN Red List	CITES Appendix I	Other status	Justification
Plantae								
TRACHEOPHYTA/ MAGNOLIOPSIDA	<i>Cryptocarya foetida</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	Nationally listed (EPBC Act) – vulnerable; State listed (QLD Nature Conservation Act 1992) – vulnerable	Nationally listed threatened species (EPBC). This species is only recorded on the mainland between Gympie and Ballina (NSW) as well as North Stradbroke and St Helena islands in Moreton Bay. This species contributes to the biodiversity of the site.
TRACHEOPHYTA/ MAGNOLIOPSIDA	<i>Olearia hygrophila</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	Nationally listed (EPBC Act) – endangered; State listed (QLD Nature Conservation Act 1992) – endangered	Nationally listed threatened species (EPBC). This species is endemic to North Stradbroke Island and is wetland dependent. It contributes to the biodiversity of the site.
TRACHEOPHYTA/ LILIOPSIDA	<i>Phaius australis</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	Nationally listed (EPBC Act) – endangered; State listed (QLD Nature Conservation Act 1992) – endangered	Nationally listed threatened species (EPBC). This species is found frequently on the bay islands, but rarely on the mainland. It contributes to the biodiversity of the site.
TRACHEOPHYTA/ LILIOPSIDA	<i>Phaius australis bernaysii</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	Nationally listed (EPBC Act) – endangered; State listed (QLD Nature Conservation Act 1992) – endangered	Nationally listed threatened species (EPBC). This species is found frequently on the bay islands, but rarely on the mainland. This species contributes to the biodiversity of the site.

Moreton Bay supports approximately 275 macroalgae species, representing 40% of all macroalgae species reported in Queensland (Phillips 1998 in Tibbetts et al. 1998). A large proportion of these species occur in the Ramsar site, although this number includes the reef areas outside the site. Overall, tropical/subtropical species predominate (approximately 64% of species). Several of these have their southernmost distribution limit in the Bay (ibid).

Other flora communities of note within the Ramsar site include saltmarsh, seagrass and mangrove ecosystems. These provide habitat to a range of species at various stages in their life cycles, including commercially and recreationally significant fish species and crustacea.

Saltmarshes are important for a range of ecosystem services, including providing habitat for species, carbon capture and storage, and water quality filtration. In Moreton Bay saltmarsh declined by 36%, a net loss of 5,700 ha, between 1955 and 2012 (Accad et al. 2016). Threats including reclamation for development, damage from recreational and industrial traffic, stormwater quality impacts, weed infestations, and mangrove incursion. Mangrove incursion is the major recent driver of loss of this community with 47% converted to mangrove communities (Accad et al. 2016; Wegscheidl et al. 2015).

Seven species of seagrass occur in the site. Most estuaries of the same bioregion typically host only one to three species (Abal et al. 1998 in Tibbetts et al. 1998; Roelfsema et al. 2009). Previous studies have estimated seagrass meadows cover approximately 190 km² of Moreton Bay with *Zostera muelleri* the dominant species in the intertidal and shallow areas (Roelfsema et al. 2013; Digby et al. 1998 in Gibbes et al. 2014).

Seven to eight species of mangrove occur in the site (Dowling and Stephens 2001; Duke 2006). Fourteen distinct mangrove communities have been mapped by the Queensland Herbarium covering an area of approximately 15,231 ha of the Bay (Dowling and Stephens 2001; Accad et al. 2016). The site represents the southernmost distribution limit of *Cerriops australis* and *Lumnitzera racemosa*. The area of mangrove community distribution in Moreton Bay has increased by 6.4% since 1955, due mainly to encroachment of mangroves into saltmarsh and swamp she-oak (*Casuarina glauca*) communities, and the colonisation and expansion of mangroves along the coastline where sediment from the catchment has been deposited (Accad et al. 2016).

Extensive loss of paperbark (*Melaleuca* spp.) swamps has occurred within southeast Queensland due to development. The paperbark communities within the Ramsar site are an important representation of this wetland type within the bioregion. Similarly, few areas of extensive, intact heathlands remain within the bioregion. Wallum heathland is particularly important due to the diversity of flora species, and the unique fauna species that inhabit it. The Ramsar site provides an important refuge for these habitats.

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

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence ¹⁾	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
Others																	
CHORDATA / REPTILIA	<i>Caretta caretta</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20	2005-2018	2.5	VU	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Nationally listed (EPBC Act) – endangered, marine, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – endangered	Nationally and internationally listed threatened species (EPBC and IUCN). There is a resident nesting population in Moreton Bay, with strong fidelity to foraging grounds. Australia's eastern coast population of nesting loggerhead turtles belong to the southwest Pacific Ocean genetic stock, a genetically distinct breeding stock considered as a separate management unit (FitzSimmons and Limpus 2014). The eastern Australia loggerhead turtle sub-population currently comprises an estimated 700-800 nesting females (Dr Limpus, C pers. comm. 2018). See additional information (6.1.2 vi) for Criterion 9 justification.
CHORDATA / REPTILIA	<i>Chelonia mydas</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10000	1993-2018	1.4	EN	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Nationally listed (EPBC Act) – vulnerable, marine, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – vulnerable	Nationally and internationally listed threatened species (EPBC and IUCN). Moreton Bay provides important feeding grounds for a resident population of green turtle, which occasionally nests within the site. The population size is based on survey data and an estimated total population of 700,000 individuals. See additional information (6.1.2 vi) for Criterion 9 justification.

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
CHORDATA / AMPHIBIA	<i>Crinia tinnula</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	100	2018	1.1	VU	<input type="checkbox"/>	<input type="checkbox"/>	State listed (QLD Nature Conservation Act 1992) – vulnerable	Internationally listed threatened species (IUCN). This species is acid wetland dependant. The population size and percentage estimate is 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. See additional information (6.1.2 vi) for Criterion 9 justification.
CHORDATA / REPTILIA	<i>Dermochelys coriacea</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				VU	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Nationally listed (EPBC Act) – endangered, marine, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – endangered	Nationally and internationally listed threatened species (EPBC and IUCN). This species is a seasonal visitor to the site and/ or occurs in lower abundance at the site. It contributes to the biodiversity of the site.
CHORDATA / MAMMALIA	<i>Dugong dugon</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	850	1995- 2016	97	VU	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – vulnerable	Internationally listed threatened species (IUCN). The site is the southernmost distribution of this species range. The resident dugong population in Moreton Bay is a distinct sub-population of the Australian east coast population, with genetic studies indicating significant genetic differentiation of dugong populations over relatively small distances in southern Queensland (Seddon et al. 2014). The most recent aerial survey of dugong in Moreton Bay in 2016, estimated relative dugong abundance at 601 with a standard error of 80 (Sobtzick et al. 2017). See additional information (6.1.2 vi) for Criterion 9 justification.
CHORDATA / REPTILIA	<i>Eretmochelys imbricata</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				CR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Nationally listed (EPBC Act) – vulnerable, marine, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – endangered	Nationally and internationally listed threatened species (EPBC and IUCN). There is a resident population in Moreton Bay. This species contributes to the biodiversity of the site.
CHORDATA / MAMMALIA	<i>Eubalaena australis</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Nationally listed (EPBC Act) – endangered, cetacean, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – least concern	Nationally listed threatened species (EPBC). This species is a seasonal visitor, and is important for tourism. It contributes to the biodiversity of the site.
CHORDATA / REPTILIA	<i>Lepidochelys olivacea</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				VU	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Nationally listed (EPBC Act) – endangered, marine, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – endangered	Nationally and internationally listed threatened species (EPBC and IUCN). There is a resident population in Moreton Bay. This species contributes to the biodiversity of the site.
CHORDATA / AMPHIBIA	<i>Litoria cooloolensis</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10	2018	1.1	EN	<input type="checkbox"/>	<input type="checkbox"/>	State listed (QLD Nature Conservation Act 1992) – near threatened	Internationally listed threatened species (IUCN). This species is acid wetland dependant. Based on limited studies of relative abundance, surveys of the extent of occurrence and area of occupancy, knowledge of habitat requirements and expert opinion, at least 1% of the Australian population of this species occur in the Moreton Bay Ramsar area. The population size and percentage estimate noted here is based on the total species population estimate of between 1000s and 10000s (Hines, H pers. comm. 2018). The exact population size at the site is unknown. See additional information (6.1.2 vi) for Criterion 9 justification.
CHORDATA / AMPHIBIA	<i>Litoria freycineti</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10	2018	1.1	VU	<input type="checkbox"/>	<input type="checkbox"/>	QLD (Nature Conservation Act 1992) – vulnerable	Internationally listed threatened species (IUCN). This species is acid wetland dependant, with a highly fragmented distribution, generally at low abundance. Based on limited studies of relative abundance, surveys of the extent of occurrence and area of occupancy, knowledge of habitat requirements and expert opinion, at least 1% of the Australian population of this species occur in the Moreton Bay Ramsar area. The population size and percentage estimate noted here is based on the total species population estimate of 1000s (Hines, H pers. comm. 2018). The exact population size at the site is unknown. See additional information (6.1.2 vi) for Criterion 9 justification.

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
CHORDATA/ AMPHIBIA	<i>Litoria olongburensis</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	100	2018	1.1	VU	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – vulnerable; State listed (QLD Nature Conservation Act 1992) – vulnerable	Internationally listed threatened species (IUCN). This species is acid wetland dependant, restricted to North Stradbroke Island and Great Sandy sandmasses. Based on limited studies of relative abundance, surveys of the extent of occurrence and area of occupancy, knowledge of habitat requirements and expert opinion, at least 1% of the Australian population of this species occur in the Moreton Bay Ramsar area. The population size and percentage estimate noted here is based on the total species population of between 10000s to 100000s (Hines, H pers. comm. 2018). The exact population size at the site is unknown. See additional information (6.1.2 vi) for Criterion 9 justification.
CHORDATA/ MAMMALIA	<i>Megaptera novaeangliae</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Nationally listed (EPBC Act) – vulnerable, cetacean, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – vulnerable	Nationally listed threatened species (EPBC). This species is a seasonal visitor, and is important for tourism. It contributes to the biodiversity of the site.
CHORDATA/ REPTILIA	<i>Natator depressus</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				DD	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – vulnerable, marine, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – vulnerable	Nationally listed threatened species (EPBC). There is a resident population in Moreton Bay. This species contributes to the biodiversity of the site.
CHORDATA/ MAMMALIA	<i>Physeter macrocephalus</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				VU	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Nationally listed (EPBC Act) – cetacean, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – least concern	Internationally listed threatened species (IUCN). This species contributes to the biodiversity of the site.
ARTHROPODA/ INSECTA	<i>Pseudodipsas illidgei</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1		1.1	EN	<input type="checkbox"/>	<input type="checkbox"/>	State listed (QLD Nature Conservation Act 1992) – vulnerable	Now known as <i>Acrodipsas illidgei</i> . Internationally listed threatened species (IUCN). 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 sahalensis</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				VU	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – cetacean, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – vulnerable	Internationally listed threatened species (IUCN). The site supports a resident population of this species, which is important for tourism.
CHORDATA/ MAMMALIA	<i>Stenella attenuata</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – cetacean, migratory (CMS)	This species contributes to the biodiversity of the site.
CHORDATA/ MAMMALIA	<i>Stenella longirostris</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – cetacean, migratory (CMS)	This species contributes to the biodiversity of the site.
CHORDATA/ MAMMALIA	<i>Xeromys myoides</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1		1.1	VU	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – vulnerable; State listed (QLD Nature Conservation Act 1992) – vulnerable	Nationally and internationally listed threatened species (EPBC and IUCN). Wetland dependent species. There is a high density population in Pumicestone Passage and Southern Moreton Bay including North and South Stradbroke Island. Total population is estimated to 10,000 mature individuals and Moreton Bay population estimated to support more than 1% of the population. See additional information (6.1.2 vi) for Criterion 9 justification.
Fish, Mollusc and Crustacea																	
CHORDATA/ ELASMOBRANCHII	<i>Carcharias taurus</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				CR	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – critically endangered; State listed (QLD Nature Conservation Act 1992) – endangered	Nationally and internationally listed threatened species (EPBC and IUCN). This is an iconic species that contributes to the diversity of fish fauna at the site. Seasonal aggregations of this species occur at the site.

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
CHORDATA / ELASMOBRANCHII	<i>Carcharodon carcharias</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				VU	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Nationally listed (EPBC Act) – vulnerable, migratory (CMS)	Nationally and internationally listed threatened species (EPBC and IUCN). This is an iconic species that contributes to the diversity of fish fauna at the site.
CHORDATA / ELASMOBRANCHII	<i>Hemirhamphys fluviorum</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT	<input type="checkbox"/>	<input type="checkbox"/>	State listed (QLD Nature Conservation Act 1992) – near threatened	This species contributes to the diversity of fish fauna at the site.
CHORDATA / ELASMOBRANCHII	<i>Isurus oxyrinchus</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				EN	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – migratory (CMS)	Internationally listed threatened species (IUCN). This species contributes to the diversity of fish fauna at the site.
CHORDATA / ELASMOBRANCHII	<i>Mobula alfredi</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				VU	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Nationally listed (EPBC Act) – migratory (CMS)	Internationally listed threatened species (IUCN). This is an iconic species that contributes to the diversity of fish fauna at the site. Seasonal aggregations of this species occur at the site.
CHORDATA / ELASMOBRANCHII	<i>Mobula japonica</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input checked="" type="checkbox"/>	Nationally listed (EPBC Act) – migratory (CMS)	This species contributes to the diversity of fish fauna at the site.
CHORDATA / ACTINOPTERYGII	<i>Nannoperca oxleyana</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1	2009	1.1	EN	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – endangered; State listed (QLD Nature Conservation Act 1992) – vulnerable	Nationally and internationally listed threatened species (EPBC and IUCN). This species contributes to the diversity of fish fauna at the site. This species is a coastal wetland habitat specialist and is geographically isolated from other populations, leading to high levels of genetic divergence. Comprehensive sampling efforts indicate this species has a significant proportion of their population at Moreton and North Stradbroke Islands (Knight et al. 2009). See additional information (6.1.2 vi) for Criterion 9 justification.
CHORDATA / ELASMOBRANCHII	<i>Sphyrna lewini</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				EN	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – conservation dependent	Internationally listed threatened species (IUCN). This species contributes to the diversity of fish fauna at the site.
CHORDATA / ELASMOBRANCHII	<i>Sphyrna mokarran</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				EN	<input type="checkbox"/>	<input type="checkbox"/>		Internationally listed threatened species (IUCN). This species contributes to the diversity of fish fauna at the site.
CHORDATA / ACTINOPTERYGII	<i>Syngnathoides biaculeatus</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine	This species contributes to the diversity of fish fauna at the site. Breeding aggregations of this species use the seagrass meadows within the site.
ARTHROPODA / MALACOSTRACA	<i>Tenuibranchiurus glypticus</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				EN	<input type="checkbox"/>	<input type="checkbox"/>	State listed (QLD Nature Conservation Act 1992) – vulnerable	Internationally listed threatened species (IUCN). This species is a coastal wetland habitat specialist and is geographically isolated from other populations, leading to high levels of genetic divergence. It contributes to the biodiversity of the site.
Birds																	
CHORDATA / AVES	<i>Actitis hypoleucos</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA);	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the East Asian-Australasian Flyway (EAAF). Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Apus pacificus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	Migratory species that contributes to biodiversity of the site.

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
CHORDATA / AVES	<i>Arenaria interpres</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Botaurus poiciloptilus</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				EN	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – endangered; State listed (QLD Nature Conservation Act 1992) - least concern	Nationally and internationally listed threatened species (EPBC and IUCN). Wetland-dependent species that contributes to diversity and abundance of birds at the site.
CHORDATA / AVES	<i>Calidris acuminata</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1550	2013-2017	1.82	LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); State listed (QLD Nature Conservation Act 1992) – special least concern	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species regularly exceeds the 1% threshold based on Hansen et al. 2016. The EAAF population estimate for this species is 85,000 individuals (based on Hansen et al 2016 estimates). The site regularly supports 1.82% of the flyway population. Using the Wetlands International (2008) flyway population estimate (of 160,000), the site regularly supports 0.97% of the flyway population.
CHORDATA / AVES	<i>Calidris alba</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Calidris canutus</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – endangered, marine, migratory (CMS CAMBA, JAMBA, ROKAMBA);	Nationally listed threatened species (EPBC). This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Calidris ferruginea</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2126	2013-2017	2.36	NT	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – critically endangered, marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); State listed (QLD Nature Conservation Act 1992) – endangered	Nationally listed threatened species (EPBC). This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. This species regularly exceeds the 1% threshold based on WI WPE and Hansen et al. 2016. The EAA flyway population estimate for this species is 90,000 individuals (based on Hansen et al 2016 estimates). The site regularly supports 2.36% of the flyway population. Using the Wetlands International (2008) flyway population estimate (of 140,000), the site regularly supports 1.52% of the flyway population.
CHORDATA / AVES	<i>Calidris melanotos</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, JAMBA, ROKAMBA)	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
CHORDATA/ AVES	<i>Calidris ruficollis</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4919	2013-2017	1.04	NT	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); State listed (QLD Nature Conservation Act 1992) – special least concern	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species regularly exceeds the 1% threshold based on WI WPE and Hansen et al. 2016. The EAAF population estimate for this species is 475,000 individuals (based on Hansen et al 2016 estimates). The site regularly supports 1.04% of the flyway population. Using the Wetlands International (2008) flyway population estimate (of 320,000), the site regularly supports 1.54% of the flyway population
CHORDATA/ AVES	<i>Calidris tenuirostris</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				EN	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Nationally listed (EPBC Act) – critically endangered, marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); State listed (QLD Nature Conservation Act 1992) – endangered	Nationally and internationally listed threatened species (EPBC and IUCN). This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA/ AVES	<i>Calonectris leucomelas</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	Migratory species that contributes to diversity and abundance of waterbirds at the site.
CHORDATA/ AVES	<i>Charadrius bicinctus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	248	2013-2017	1.31	LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS)	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species regularly exceeds the 1% threshold based on Hansen et al. 2016. The EAAF population estimate for this species is 19,000 individuals (based on Hansen et al 2016 estimates). The site regularly supports 1.31% of the flyway population. Using the Wetlands International (2008) flyway population estimate (of 50,000), the site regularly supports 0.5% of the flyway population.
CHORDATA/ AVES	<i>Charadrius leschenaultii</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – vulnerable, marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); State listed (QLD Nature Conservation Act 1992) – vulnerable.	Nationally listed threatened species (EPBC). This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA/ AVES	<i>Charadrius mongolus</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1949	2013-2017	1.08	LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – endangered, marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); State listed (QLD Nature Conservation Act 1992) – endangered	Nationally listed threatened species (EPBC). This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. The EAAF population estimate for this species is 180,000 individuals (based on Hansen et al 2016 estimates). The site regularly supports 1.08% of the flyway population. Using the Wetlands International (2008) flyway population estimate (of 25,500), the site regularly supports 7.4% of the flyway population.

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
CHORDATA / AVES	<i>Charadrius veredus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Chlidonias leucopterus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Cuculus optatus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – migratory (CAMBA)	Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Diomedea exulans</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				VU	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – vulnerable, Marine, Migratory (CMS); State listed (QLD Nature Conservation Act 1992) – vulnerable	Nationally and internationally listed threatened species (EPBC and IUCN). Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Esacus magnirostris</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) - marine; State listed (QLD Nature Conservation Act 1992) – vulnerable	The site provides important breeding habitat for this species. This species contributes to the biodiversity of the site.
CHORDATA / AVES	<i>Fregata ariel</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	Migratory species that contributes to the biodiversity of the site.
CHORDATA / AVES	<i>Fregata minor</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CAMBA, JAMBA)	Migratory species that contributes to the biodiversity of the site.
CHORDATA / AVES	<i>Fregatta grallaria grallaria</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – vulnerable State listed (QLD Nature Conservation Act 1992) – least concern	Nationally listed threatened species (EPBC). This subspecies contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Gallinago hardwickii</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, JAMBA, ROKAMBA)	Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Gelochelidon nilotica</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CAMBA)	Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Haematopus longirostris</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	560	2013-2017	5.09	LC	<input type="checkbox"/>	<input type="checkbox"/>	State listed (QLD Nature Conservation Act 1992) – least concern	The site provides important breeding habitat for this species. This is a resident species that regularly exceeds the 1% threshold based on WI WPE. The Australian population estimate for this species is 11,000 individuals (based on Wetlands International WPE). The site regularly supports 5.09% of the population. This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Halobaena caerulea</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – vulnerable, marine; State listed (QLD Nature Conservation Act 1992) – least concern	Nationally listed threatened species (EPBC). This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Hirundapus caudacutus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Hydroprogne caspia</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (JAMBA)	Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Lathamus discolor</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				CR	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – critically endangered, marine; State listed (QLD Nature Conservation Act 1992) – endangered	Nationally and internationally listed threatened species (EPBC and IUCN). This species contributes to the biodiversity of the site.

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
CHORDATA / AVES	<i>Limicola falcinellus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Limnodromus semipalmatus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Limosa lapponica</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11650	2013-2017	3.59	NT	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – vulnerable, marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); State listed (QLD Nature Conservation Act 1992) – vulnerable	Nationally listed threatened species (EPBC). This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds may use the site year-round. The site provides important feeding and roosting habitats. This species regularly exceeds the 1% threshold based on WI WPE and Hansen et al. 2016. The EAAF population estimate for this species is 325,000 individuals (based on Hansen et al 2016 estimates). The site regularly supports 3.58% of the flyway population. Using the Wetlands International (2008) flyway population estimate (of 120,000), the site regularly supports 9.71% of the flyway.
CHORDATA / AVES	<i>Limosa limosa</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Macronectes giganteus</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – endangered, marine, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – endangered	Nationally listed threatened species (EPBC). This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Macronectes halli</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – vulnerable, marine, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – vulnerable	Nationally listed threatened species (EPBC). This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Monarcha melanopsis</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS)	Migratory species that contributes to the biodiversity of the site.
CHORDATA / AVES	<i>Motacilla flava</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	Migratory species that contributes to the biodiversity of the site.
CHORDATA / AVES	<i>Myiagra cyanoleuca</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS)	Migratory species that contributes to the biodiversity of the site.

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
CHORDATA / AVES	<i>Numenius madagascariensis</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3158	2013-2017	9.02	EN	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Nationally listed (EPBC Act) – critically endangered, marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); State listed (QLD Nature Conservation Act 1992) – endangered	Nationally & internationally listed threatened species. This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds may use the site year-round. The site provides critical feeding and roosting habitats. This species regularly exceeds the 1% threshold based on WI WPE and Hansen et al. 2016. The EAAF population estimate for this species is 35,000 individuals (based on Hansen et al 2016 estimates). The site regularly supports 9.02% of the flyway population. Using the WI (2008) flyway population estimate (of 32,000), the site regularly supports 9.87% of the flyway population.
CHORDATA / AVES	<i>Numenius minutus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Numenius phaeopus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1140	2013-2017	1.75	LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) - marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); State listed (QLD Nature Conservation Act 1992) – special least concern	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species regularly exceeds the 1% threshold based on WI WPE and Hansen et al. 2016. The EAA flyway population estimate for this species is 65,000 individuals (based on Hansen et al 2016 estimates). The site regularly supports 1.75% of the flyway population. Using the Wetlands International (2008) flyway population estimate (of 55,000), the site regularly supports 2.07% of the flyway population.
CHORDATA / AVES	<i>Oceanites oceanicus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (JAMBA)	Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Onychoprion anaethetus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – migratory (CAMBA, JAMBA)	Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Pandion cristatus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS)	Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Phaethon rubricauda</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CAMBA, JAMBA); State listed (QLD Nature Conservation Act 1992) – vulnerable	Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Phoebastria palpebrata</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS)	This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Plegadis falcinellus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS)	This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Pluvialis fulva</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
CHORDATA / AVES	<i>Pluvialis squatarola</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Puffinus carneipes</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (JAMBA, ROKAMBA)	This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Puffinus griseus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (JAMBA)	This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Puffinus pacificus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (JAMBA); State listed (QLD Nature Conservation Act 1992) – vulnerable	This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Puffinus tenuirostris</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Rostratula australis</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				EN	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – endangered, marine; State listed (QLD Nature Conservation Act 1992) – vulnerable	Nationally and internationally listed threatened species (EPBC and IUCN). This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Stercorarius longicaudus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CAMBA, JAMBA)	Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Stercorarius parasiticus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Stercorarius pomarinus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CAMBA, JAMBA)	Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Sterna dougallii</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CAMBA, JAMBA)	Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Sterna hirundo</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Sterna paradisaea</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS)	Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Sterna sumatrana</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CAMBA, JAMBA)	Migratory species that contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Sternula albifrons</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, JAMBA, CAMBA, ROKAMBA); State listed (QLD Nature Conservation Act 1992) – special least concern	The site provides important breeding (nesting) habitat for this species. This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Sula dactylatra</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (JAMBA, ROKAMBA)	This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Sula leucogaster</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CAMBA, JAMBA, ROKAMBA)	This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Thalassarche bulleri</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – vulnerable, marine, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – vulnerable	Nationally listed threatened species (EPBC). This species contributes to the diversity and abundance of waterbirds at the site.

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
CHORDATA / AVES	<i>Thalassarche carteri</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				EN	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) –vulnerable, marine, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – vulnerable	Nationally and internationally listed threatened species (EPBC and IUCN). This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Thalassarche cauta</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) –vulnerable, marine, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – vulnerable	Nationally listed threatened species (EPBC). This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Thalassarche chrysostoma</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				EN	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) –endangered, marine, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – vulnerable	Nationally and internationally listed threatened species (EPBC and IUCN). This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Thalassarche melanophris</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) –vulnerable, marine, migratory (CMS); State listed (QLD Nature Conservation Act 1992) – special least concern	Nationally listed threatened species (EPBC). This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Tringa brevipes</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2430	2013-2017	3.47	NT	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); State listed (QLD Nature Conservation Act 1992) – special least concern	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species regularly exceeds the 1% threshold based on WI WPE and Hansen et al. 2016. The EAA flyway population estimate for this species is 70,000 individuals (based on Hansen et al 2016 estimates). The site regularly supports 3.47% of the flyway population. Using the Wetlands International (2008) flyway population estimate (of 44,000), the site regularly supports 5.52% of the flyway population.
CHORDATA / AVES	<i>Tringa glareola</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Tringa incana</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, JAMBA)	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Tringa nebularia</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
CHORDATA / AVES	<i>Tringa stagnatilis</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Tringa totanus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA)	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.
CHORDATA / AVES	<i>Xenus cinereus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>	Nationally listed (EPBC Act) – marine, migratory (CMS, CAMBA, JAMBA, ROKAMBA); State listed (QLD Nature Conservation Act 1992) – special least concern	This species uses the site for non-breeding habitat during the northern winter and/or as a stopover point on southward and northward migration through the EAAF. Sub-adult birds (not yet ready to reproduce) may use the site year-round. The site provides important feeding and roosting habitats. This species contributes to the diversity and abundance of waterbirds at the site.

1) Percentage of the total biogeographic population at the site

Note that the listing of status of species above are as 2018.

For some species listed under criterion 9 (above), the percent occurrence (e.g., 1.1) refers to an estimated population above 1%. (e.g. the four acid frog species). 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*, *Pseudodipsas illidgei* and *Xeromys myoides* indicates that there are no current official records of the exact population at the site.

The Site supports an abundance and diversity of native fauna, including high abundance and diversity of waterbirds. All six marine turtle species that occur in Australian waters have been recorded in Moreton Bay (Limpus et al. 2006). Seasonal aggregations of manta rays, grey nurse sharks and zebra sharks occur. 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).

The Site is the southern limit of the Australian distribution of dugong (Lanyon 2003) and contains one of the largest dugong populations on the east coast of Australia. Recent surveys suggest that climate and weather events have a significant influence on abundance, distribution, and fecundity of dugongs, due to effects on seagrass habitats (Sobtzick et al. 2015). The eastern Amity Banks, Moreton Banks (Eastern Banks) and adjacent areas are considered the most important seagrass habitats for dugong in the Bay (Lanyon 2003; Marsh et al. 2011; Sobtzick et al. 2017). Rous Channel and east of South Passage (to 10 m offshore of Moreton Island) are also important in cooler months. Pumicestone Passage's tidal flats and estuarine wetland assemblages support intertidal flats, shoals and seagrass, and are critical to dugongs (Lanyon et al. 2005).

The wallum wetlands support the Oxleyan pygmy perch, ornate rainbowfish and swamp crayfish. These species are coastal wetland habitat specialists, often with geographically isolated populations, leading to high genetic divergence (Dawkins et al. 2010; Hughes et al. 1999; Page et al. 2004; 2012; Mather et al. 2015). Acid frogs are uniquely adapted to breeding in low-pH, low-nutrient waters and are typically found in coastal and sub-coastal Melaleuca swamps, wet heath, sedgeland and lakes in SE Queensland and northern NSW. Three important acid frog populations occur within the Ramsar site: Bribie Island National Park; Moreton Island National Park; and North Stradbroke Island National Park (Meyer et al. 2006). Populations have declined due to habitat loss; competition; predation; and fragmentation and degradation due to changes in hydrological regimes (Ingram and Corben 1975; Gillespie and Hero 1999; Lowe et al. 2015; Meyer et al. 2006; Hines and Meyer 2011).

See section 6.1.2 vi for additional information on the species listed above, and a more detailed justification of species included under criterion 9.

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
Lowland Rainforest of Subtropical Australia	<input checked="" type="checkbox"/>	A full description is available in the TEC conservation advice: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/101-conservation-advice.pdf	Nationally listed (EPBC Act) – critically endangered
Subtropical and Temperate Coastal Saltmarsh	<input checked="" type="checkbox"/>	A full description is available in the TEC conservation advice: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/118-conservation-advice.pdf	Nationally listed (EPBC Act) – vulnerable
Coastal Swamp Oak (<i>Casuarina glauca</i>) Forest of New South Wales and South East Queensland	<input checked="" type="checkbox"/>	A full description is available in the threatened ecological community (TEC) conservation advice: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/141-conservation-advice.pdf	Nationally listed (EPBC Act) – endangered
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	<input checked="" type="checkbox"/>	A full description is available in the TEC conservation advice: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/76-conservation-advice-12112015.pdf	Nationally listed (EPBC Act) – critically endangered

Optional text box to provide further information

These threatened ecological communities include the following regional ecosystems, mapped and classified by the Queensland state government:

- *Casuarina glauca* woodland on margins of marine clay plains (RE 12.1.1)
Status - of concern (QLD Vegetation Management Act 1999); of concern (QLD Biodiversity status). Open forest to low open woodland. Occurs on margins of Quaternary estuarine deposits.
- Saltpan vegetation including grassland, herbland and sedgeland on marine clay plains (RE 12.1.2)
Status - least concern (QLD Vegetation Management Act 1999); no concern at present (QLD Biodiversity status). Saltpan vegetation comprises *Sporobolus virginicus* grassland and samphire herbland. Grasses including *Zoysia macrantha* subsp. *macrantha* are sometimes present in the upper portions of tidal flats. Includes saline or brackish sedgelands. Usually occurs on hypersaline Quaternary estuarine deposits. Marine plains/tidal flats.
- Notophyll vine forest on parabolic high dunes (RE 12.2.1)
Status - of concern (QLD Vegetation Management Act 1999); of concern (QLD Biodiversity status). Notophyll/ evergreen notophyll vine forest generally includes abundant *Archontophoenix cunninghamiana* or *A. alexandrae* in the north of bioregion. The plant families Lauraceae, Myrtaceae and Elaeocarpaceae are diagnostic of the type. Occurs on moist/wet, valley floors of parabolic dunes.
- Microphyll/notophyll vine forest on beach ridges (RE 12.2.2)
Status - of concern (QLD Vegetation Management Act 1999); endangered (QLD Biodiversity status). Characteristic species include *Cupaniopsis anacardioides*, *Acronychia imperforata*, *Flindersia schottiana*, *Alectryon coriaceus*, *Elaeocarpus obovatus*, *Polyalthia nitidissima*, *Diospyros* spp., *Pleiogynium timorense* and *Mallotus discolor*. *Melaleuca* spp. and eucalypt emergents may be present, e.g., *Melaleuca dealbata* and *Corymbia tessellaris*. Occurs on Quaternary coastal dunes and beaches.
- Complex notophyll vine forest (RE 12.3.1a)
Status - endangered (QLD Vegetation Management Act 1999); endangered (QLD Biodiversity status). Typical canopy species include *Castanospermum australe*, *Elaeocarpus grandis*, *Grevillea robusta*, *Cryptocarya obovata*, *Beilschmiedia obtusifolia*, *Dysoxylum mollissimum* subsp. *molle*, *Pseudoweinmannia lachnocarpa*, *Argyrodendron trifoliolatum*, *Planchonella australis*, *Ficus watkinsiana*, *F. macrophylla* forma *macrophylla*, *Aphananthe philippinensis*, *Toona ciliata* and *Syzygium francisii*. Emergent *Eucalyptus grandis* or *Lophostemon confertus* may occur. *Waterhousea floribunda* and *Tristaniopsis laurina* may occur on banks of stream channels. Typical sub canopy species include *Cryptocarya triplinervis*, *Archontophoenix cunninghamiana*, *Endiandra pubens*, *Arytera divaricata*, *Syzygium moorei* and *Macadamia* spp. Occurs on Quaternary alluvial plains and channels in areas of high rainfall (generally >1300mm). Riverine wetland or fringing riverine wetland.
- *Melaleuca quinquenervia*, *Casuarina glauca* +/- *Eucalyptus tereticornis*, *E. siderophloia* open forest on low coastal alluvial plains (RE 12.3.20)
Status least concern (QLD Vegetation Management Act 1999); endangered (QLD Biodiversity status). Occurs on lowest terraces of Quaternary alluvial plains in coastal areas.

4 - What is the Site like? (Ecological character description)

4.1 - Ecological character

The 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 character of the site include:

- physical coastal processes (tides, currents, erosion, accretion)
- hydrology (tidal inundation, freshwater flows, groundwater interactions)
- energy and nutrient dynamics (carbon and nutrient cycling)
- biological processes
- water quality
- climate
- geomorphology

Underlying critical components include:

- wetland habitats
- wetland dependent fauna and flora

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 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 improvement in the management of pressures on the site (refer to section 5).

See section 6.1.2 vi for additional information.

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

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 Freshwater springs; oases		0	5	

Human-made wetlands

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

(ECD) Habitat connectivity

A key feature of the Moreton Bay is its large size, the diversity of wetland habitats and the connectivity between these habitats. See section 6.1.2 vi for additional information.

4.3 - Biological components

4.3.1 - Plant species

Other noteworthy plant species

Phylum	Scientific name	Position in range / endemism / other
TRACHEOPHYTAMAGNOLIOPSIDA	<i>Acacia baueri baueri</i>	State listed (QLD Nature Conservation Act 1992) – vulnerable
TRACHEOPHYTALILIOPSIDA	<i>Blandfordia grandiflora</i>	State listed (QLD Nature Conservation Act 1992) – endangered
TRACHEOPHYTAMAGNOLIOPSIDA	<i>Durringtonia paludosa</i>	State listed (QLD Nature Conservation Act 1992) – near threatened
TRACHEOPHYTALILIOPSIDA	<i>Eleocharis difformis</i>	State listed (QLD Nature Conservation Act 1992) – endangered
TRACHEOPHYTALILIOPSIDA	<i>Maundia triglochinosides</i>	State listed (QLD Nature Conservation Act 1992) – vulnerable
TRACHEOPHYTALILIOPSIDA	<i>Prasophyllum exile</i>	State listed (QLD Nature Conservation Act 1992) – near threatened
TRACHEOPHYTALILIOPSIDA	<i>Pterostylis nigricans</i>	State listed (QLD Nature Conservation Act 1992) – near threatened
TRACHEOPHYTAPOLYPODIOPSIDA	<i>Thelypteris confluens</i>	State listed (QLD Nature Conservation Act 1992) – vulnerable

Invasive alien plant species

Phylum	Scientific name	Impacts	Changes at RIS update
TRACHEOPHYTAMAGNOLIOPSIDA	<i>Acanthospermum australe</i>	Potential	unknown
TRACHEOPHYTAMAGNOLIOPSIDA	<i>Acokanthera oblongifolia</i>	Potential	unknown
TRACHEOPHYTALILIOPSIDA	<i>Agave americana</i>	Potential	unknown
TRACHEOPHYTALILIOPSIDA	<i>Agave americana americana</i>	Potential	unknown
TRACHEOPHYTALILIOPSIDA	<i>Agave sisalana</i>	Potential	unknown

Optional text box to provide further information

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

A complete list of invasive plant species that occur within the site has been attached under additional information (see section 6.1.2). No detailed site specific assessment has been undertaken to determine which invasive species are of greater threat to the character of the Site. The term 'potential' (above) should be interpreted as 'not assessed'.

4.3.2 - Animal species

Other noteworthy animal species

Phylum	Scientific name	Pop. size	Period of pop. est.	% occurrence	Position in range /endemism/other
CHORDATA/REPTILIA	<i>Acanthophis antarcticus</i>				State listed (QLD Nature Conservation Act 1992) – vulnerable
CHORDATA/AMPHIBIA	<i>Adelotus brevis</i>				State listed (QLD Nature Conservation Act 1992) – vulnerable
CHORDATA/AVES	<i>Calyptorhynchus lathamii</i>				State listed (QLD Nature Conservation Act 1992) – vulnerable
CHORDATA/AVES	<i>Falco hypoleucos</i>				Internationally listed (IUCN) - vulnerable. However, not a wetland dependent species.
CHORDATA/AVES	<i>Ninox strenua</i>				State listed (QLD Nature Conservation Act 1992) – vulnerable
ARTHROPODA/INSECTA	<i>Ornithoptera richmondia</i>				State listed (QLD Nature Conservation Act 1992) – vulnerable
CHORDATA/AVES	<i>Pezoporus wallicus wallicus</i>				State listed (QLD Nature Conservation Act 1992) – vulnerable
CHORDATA/MAMMALIA	<i>Phascolarctos cinereus</i>				Nationally listed (EPBC) - endangered. However, not a wetland dependent species.

Invasive alien animal species

Phylum	Scientific name	Impacts	Changes at RIS update
CHORDATA/AVES	<i>Acridotheres tristis</i>	Potential	No change
CHORDATA/AVES	<i>Anas platyrhynchos</i>	Potential	No change
CHORDATA/AVES	<i>Cacatua tenuirostris</i>	Potential	No change
CHORDATA/MAMMALIA	<i>Canis lupus familiaris</i>	Potential	No change
CHORDATA/MAMMALIA	<i>Capra hircus</i>	Potential	No change
CHORDATA/AVES	<i>Carduelis carduelis</i>	Potential	No change
CHORDATA/AVES	<i>Columba livia</i>	Potential	No change
CHORDATA/MAMMALIA	<i>Equus caballus</i>	Potential	No change
CHORDATA/MAMMALIA	<i>Felis catus</i>	Potential	No change
CHORDATA/ACTINOPTERYGII	<i>Gambusia holbrooki</i>	Potential	No change
CHORDATA/REPTILIA	<i>Hemidactylus frenatus</i>	Potential	No change
CHORDATA/MAMMALIA	<i>Lepus europaeus</i>	Potential	No change
CHORDATA/AVES	<i>Lonchura punctulata</i>	Potential	No change
CHORDATA/MAMMALIA	<i>Mus musculus</i>	Potential	No change
CHORDATA/ACTINOPTERYGII	<i>Oreochromis spilurus</i>	Potential	No change
CHORDATA/AVES	<i>Passer domesticus</i>	Potential	No change
CHORDATA/AVES	<i>Pavo cristatus</i>	Potential	No change
CHORDATA/MAMMALIA	<i>Rattus rattus</i>	Potential	No change
CHORDATA/AMPHIBIA	<i>Rhinella marina</i>	Potential	No change
CHORDATA/AVES	<i>Streptopelia chinensis</i>	Potential	No change
CHORDATA/AVES	<i>Sturnus vulgaris</i>	Potential	No change
CHORDATA/MAMMALIA	<i>Vulpes vulpes</i>	Potential	No change

Optional text box to provide further information

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

The freshwater wetlands of Moreton and North Stradbroke Islands sustain unique fauna often exhibiting high levels of genetic divergence, including the Oxleyan pygmy perch, a crayfish (*Cherax robustus*) with restricted distribution, an undescribed species of false-spider crab (*Amarinus* sp.) and the one-gilled swamp eel (*Ophisternon* sp.) (Dawkins et al. 2010; Marshall et al. 2011). It includes the only known population in Queensland of the rare heath shadeskink (*Saproscincus orarius*) (Hines, Meyer and Hetherington 2015).

A genetically distinct population of koalas (*Phascolarctos cinereus*) (nationally 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).

No detailed site specific assessment has been undertaken for invasive animal species, so the term 'potential' (above) should be interpreted as 'not assessed'.

4.4 - Physical components

4.4.1 - Climate

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

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 increased intensity of rain events and consequential flooding (DEHP 2017a). Extreme weather events (such as the major floods of 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, and ocean acidification. These may alter habitats, affect breeding success, species health and mortality.

See section 6.1.2 vi for additional information.

4.4.2 - Geomorphic setting

a) Minimum elevation above sea level (in metres)

a) Maximum elevation above sea level (in metres)

- 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.

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

(Update) Changes at RIS update No change Increase Decrease Unknown

Organic

(Update) Changes at RIS 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)

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).

The depositional basin of Moreton Bay is comprised on a mixture of fluvial delta sands and muds that dominate the western regions of the bay, while clean marine sands and carbonate sediments dominate the norther and eastern regions. Most of the surface sediments of the southern regions comprise sandy mud (Coates-Marnane et al 2016b, Lockington et al 2016).

The western side of the Bay associated with the mainland contains extensive mapped areas of potential acid sulfate soils (see: <https://qldglobe.information.qld.gov.au/>).

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 precipitation	<input type="checkbox"/>	No change
Water inputs from groundwater	<input type="checkbox"/>	No change
Water inputs from surface water	<input checked="" type="checkbox"/>	No change
Marine water	<input checked="" 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 largely stable	No change
Water levels fluctuating (including tidal)	No change

Please add any comments on the water regime and its determinants (if relevant). Use this box to explain sites with complex hydrology.

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). Most 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 (Yu et al 2011).

(ECD) Connectivity of surface waters and of groundwater	Many of the wetlands within the site have connections to and/or are dependent on groundwater. See section 6.1.2 vi for additional information.
(ECD) Stratification and mixing regime	The Bay part of the Site is characterised by a broad mixing zone, with good connections between marine, estuarine and freshwater systems. Stratification and mixing regimes of the freshwater wetlands are variable. See section 6.1.2 vi.

4.4.5 - Sediment regime

Significant erosion of sediments occurs on the site

(Update) Changes at RIS update No change Increase Decrease Unknown

Significant accretion or deposition of sediments occurs on the site

(Update) Changes at RIS update No change Increase Decrease Unknown

Significant transportation of sediments occurs on or through the site

(Update) Changes at RIS update No change Increase Decrease Unknown

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

(Update) Changes at RIS update No change Increase Decrease Unknown

Sediment regime unknown

Please provide further information on sediment (optional):

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 km² of the Bay representing over 50% 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. The 2011 flood delivered an estimated 5-10 million tonnes of sediment to Moreton Bay (Steven et al 2014, Coates-Marnane et al 2016b). See section 6.1.2 vi for additional information.

(ECD) Water turbidity and colour	Turbidity varies across the site. See section 6.1.2 vi for additional information.
(ECD) Light - reaching wetland	Light penetration varies across the site. See section 6.1.2 vi for additional information.

(ECD) Water temperature Water temperature varies, depending on wetland type. See section 6.1.2 vi for additional information.

4.4.6 - Water pH

Acid (pH<5.5)

(Update) Changes at RIS update No change Increase Decrease Unknown

Circumneutral (pH: 5.5-7.4)

(Update) Changes at RIS update No change Increase Decrease Unknown

Alkaline (pH>7.4)

(Update) Changes at RIS update No change Increase Decrease Unknown

Unknown

Please provide further information on pH (optional):

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 Iantsoff 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, willum 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)

(Update) Changes at RIS update No change Increase Decrease Unknown

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

(Update) Changes at RIS update No change Increase Decrease Unknown

Euhaline/Eusaline (30-40 g/l)

(Update) Changes at RIS update No change Increase Decrease Unknown

Hyperhaline/Hypersaline (>40 g/l)

(Update) Changes at RIS update No change Increase Decrease Unknown

Unknown

Please provide further information on salinity (optional):

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).

(ECD) Dissolved gases in water

Variable

4.4.8 - Dissolved or suspended nutrients in water

Eutrophic

(Update) Changes at RIS update No change Increase Decrease Unknown

Mesotrophic

(Update) Changes at RIS update No change Increase Decrease Unknown

Oligotrophic

(Update) Changes at RIS update No change Increase Decrease Unknown

Dystrophic

(Update) Changes at RIS update No change Increase Decrease Unknown

Unknown

Please provide further information on dissolved or suspended nutrients (optional):

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

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).

(ECD) Dissolved organic carbon	See section 6.1.2 vi for additional information.
(ECD) Redox potential of water and sediments	Variable
(ECD) Water conductivity	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

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:

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 (www.hlw.org.au). See section 6.1.2 vi for additional information.

4.5 - Ecosystem services

4.5.1 - Ecosystem services/benefits

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	Water sports and activities	High
Recreation and tourism	Picnics, outings, touring	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

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

Other ecosystem service(s) not included above:

Ecosystem services include (but are not limited to):

- Soil formation – mangrove forests and seagrass beds play important roles in sediment retention and the accumulation of organic matter (Adame et al 2010).
- Nutrient cycling – mangrove communities, saltmarsh, seagrasses and other wetlands support nutrient capture, recycling, and storage. They also support carbon storage and sequestration, which helps with climate regulation. Seagrasses are important for fixing nitrogen via nitrogen-fixing bacteria. 0.2 – 0.4knN/Ha/day is fixed in Moreton Bay seagrass sediments. Mangrove forests also play an important role in nitrogen fixing and de-nitrification (Adame and Lovelock 2011).
- Biodiversity – the Site includes a range of natural and near-natural wetland types that support habitat for a range of species. Seagrass beds provide critical habitat for species such as dugong and green turtles (Sobtzick et al. 2017, Commonwealth of Australia 2017). Coral reef communities support coral and other species, including loggerhead turtles (Thomson et al. 2012). Estuarine wetlands contain intertidal flats, sandy and muddy substrates that support critical species such as shorebirds, dugong, turtles and water mice. The water mouse inhabits the critical zone of connectivity between terrestrial and marine ecosystems where it constructs mud nests that act as an island at high tide (Kaluza et al. 2016). These islands are likely to provide an important ecosystem service for other animals inhabiting the intertidal zone (ibid). Mangroves support *Crematogaster* sp. ants that form a mutually beneficial relationship with larvae of the endangered Illidge's ant-blue butterfly (Sands and New 2002; Breiffuss and Dale 2004). The freshwater wetlands of Moreton and North Stradbroke Islands sustain unique fauna often exhibiting high levels of genetic divergence. See section 4.3.2 for more information.

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):

Economic assessments include:

- 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

- 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
- ii) the site has exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland
- iii) the ecological character of the wetland depends on its interaction with local communities or indigenous peoples
- 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

<no data available>

4.6 - Ecological processes

(ECD) Primary production	Mangroves, saltmarsh, seagrass and vegetated swamps are key primary producers, supporting marine, estuarine and freshwater food webs. Sporobolus virginicus is a critical primary producer, and provides nutritional support to wetland food webs. See 6.1.2.
(ECD) Nutrient cycling	Occurring, variable
(ECD) Carbon cycling	Occurring, variable
(ECD) Animal reproductive productivity	Occurring, variable
(ECD) Vegetational productivity, pollination, regeneration processes, succession, role of fire, etc.	Occurring, variable
(ECD) Notable species interactions, including grazing, predation, competition, diseases and pathogens	Occurring, variable
(ECD) Notable aspects concerning animal and plant dispersal	Occurring, variable
(ECD) Notable aspects concerning migration	Shorebirds, whales, dolphins, marine turtles and fish undertake migrations through, in or around the Ramsar site as part of their lifecycle. Migratory shorebird foraging and roosting habitat is essential during the non-breeding and migration periods.
(ECD) Pressures and trends concerning any of the above, and/or concerning ecosystem integrity	Shorebirds (in particular migratory species) face significant threats from coastal development, disturbance (from humans, domestic and feral animals), predation, fishing (of prey species), and introduction of invasive plant species.

5 - How is the Site managed? (Conservation and management)

5.1 - Land tenure and responsibilities (Managers)

5.1.1 - Land tenure/ownership

Public ownership

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

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 km² extending seawards to the limit of Queensland waters and incorporates nearly all of the Site.

Land areas above the high water mark within the 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 Site are held by local government.

Within the Site, active Native Title claims exist to Moreton Island (Mulgumpin) (Quandamooka People #4), western Moreton Bay (Quandamooka) 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:

Queensland State Government
 Queensland Department of Environment and Science – 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
 Queensland Department of Transport and Main Roads – www.tmr.qld.gov.au
 Queensland Department of Natural Resources, Mines and Energy – www.dnrm.qld.gov.au

Local Governments
 Sunshine Coast Council – www.sunshinecoast.qld.gov.au
 Moreton Bay Regional Council – www.moretonbay.qld.gov.au
 Brisbane City Council – www.brisbane.qld.gov.au
 Redland City Council – www.redland.qld.gov.au
 City of Gold Coast – www.goldcoast.qld.gov.au

Quandamooka Yoolooburrabee Aboriginal Corporation – www.qyac.net.au
 Port of Brisbane – www.portbris.com.au
 Gold Coast Waterways Authority - www.gcwa.qld.gov.au

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

Manager, Wetlands Team, Queensland Department of Environment and Science

Postal address:

Queensland Department of Environment and Science
 GPO Box 2454
 Brisbane QLD 4001
 Australia

E-mail address:

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

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	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	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	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Dams and water management/use	unknown impact	unknown impact	<input type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Vegetation clearance/land conversion	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	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	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	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	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Industrial and military effluents	unknown impact	unknown impact	<input type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Agricultural and forestry effluents	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Garbage and solid waste	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Excess heat, sound, light	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

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	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Droughts	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Temperature extremes	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Storms and flooding	unknown impact	unknown impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

Please describe any other threats (optional):

A comprehensive site specific assessment and ranking of impacts has not been undertaken. The term "unknown" (above) should be interpreted as "not formally assessed".

In addition to the threats listed above, other potential threats to the site include (but are not limited to):

- Illegal collection or interference with native flora and fauna.
- Mosquito control programs within the site. These programs are highly regulated.
- Jamella leaf hopper (*Jamella australiae*) outbreaks and myrtle rust (*Puccinia psidii*) fungal disease.

5.2.2 - Legal conservation status

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	http://eaaflyway.net	whole

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Declared Fish Habitat Area	Coomera (FHA-023)	https://www.npsr.qld.gov.au/management/habitat-areas/area-plans.html	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)	https://www.npsr.qld.gov.au/management/habitat-areas/area-plans.html	partly
State Protected Area (QLD)	Beachmere Conservation Park	https://www.npsr.qld.gov.au/parks/	partly
State Protected Area (QLD)	Beerburum East State Forest	https://www.npsr.qld.gov.au/parks/	partly
State Protected Area (QLD)	Beerwah State Forest	https://www.npsr.qld.gov.au/parks/	partly
State Protected Area (QLD)	Bird Island Conservation Park	https://www.npsr.qld.gov.au/parks/	whole
State Protected Area (QLD)	Bribie Island National Park	https://www.npsr.qld.gov.au/parks/	partly
State Protected Area (QLD)	Bribie Island State Forest	https://www.npsr.qld.gov.au/parks/	partly
State Protected Area (QLD)	Buckleys Hole Conservation Park	https://www.npsr.qld.gov.au/parks/	partly
State Protected Area (QLD)	Bullock Creek Conservation Park	https://www.npsr.qld.gov.au/parks/	partly
State Protected Area (QLD)	Carbrook Wetlands Conservation Park 2	https://www.npsr.qld.gov.au/parks/	partly
State Protected Area (QLD)	Coombabah Lake Conservation Park	https://www.npsr.qld.gov.au/parks/	partly
State Protected Area (QLD)	Deception Bay Conservation Park	https://www.npsr.qld.gov.au/parks/	partly

Designation type	Name of area	Online information url	Overlap with Ramsar Site
State Protected Area (QLD)	Goat Island Conservation Park	https://www.npsr.qld.gov.au/park s/	whole
State Protected Area (QLD)	Hays Inlet Conservation Park 1 & 2	https://www.npsr.qld.gov.au/park s/	whole
State Protected Area (QLD)	King Island Conservation Park	https://www.npsr.qld.gov.au/park s/	whole
State Protected Area (QLD)	Main Beach Conservation Park	https://www.npsr.qld.gov.au/park s/	whole
State Protected Area (QLD)	Moreton Bay Marine Park	https://www.npsr.qld.gov.au/park s/	partly
State Protected Area (QLD)	Moreton Island National Park	https://www.npsr.qld.gov.au/mana ging/habitat-areas/area-plans.ht ml	partly
State Protected Area (QLD)	Mud Island Conservation Park	https://www.npsr.qld.gov.au/mana ging/habitat-areas/area-plans.ht ml	partly
State Protected Area (QLD)	Myora Conservation Park	https://www.npsr.qld.gov.au/mana ging/habitat-areas/area-plans.ht ml	partly
State Protected Area (QLD)	Naree Budjong Djara Conservation Park	https://www.npsr.qld.gov.au/mana ging/habitat-areas/area-plans.ht ml	partly
State Protected Area (QLD)	Naree Budjong Djara National Park	https://www.npsr.qld.gov.au/mana ging/habitat-areas/area-plans.ht ml	whole
State Protected Area (QLD)	Ningi Creek Conservation Park	https://www.npsr.qld.gov.au/mana ging/habitat-areas/area-plans.ht ml	partly
State Protected Area (QLD)	Pumicestone National Park	https://www.npsr.qld.gov.au/mana ging/habitat-areas/area-plans.ht ml	partly
State Protected Area (QLD)	South Stradbroke Island Conservation Park	https://www.npsr.qld.gov.au/mana ging/habitat-areas/area-plans.ht ml	partly
State Protected Area (QLD)	Southern Moreton Bay Islands National Park	https://www.npsr.qld.gov.au/mana ging/habitat-areas/area-plans.ht ml	partly
State Protected Area (QLD)	St Helena Island National Park	https://www.npsr.qld.gov.au/mana ging/habitat-areas/area-plans.ht ml	whole
State Protected Area (QLD)	Teerk Roo Ra Conservation Park	https://www.npsr.qld.gov.au/mana ging/habitat-areas/area-plans.ht ml	partly
State Protected Area (QLD)	Teerk Roo Ra National Park	https://www.npsr.qld.gov.au/mana ging/habitat-areas/area-plans.ht ml	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	http://datazone.birdlife.org/site/factsheet/23545	partly
Important Bird Area	Moreton Bay & Pumicestone Passage	http://birdlife.org.au/documents/OTHPUB-IBA-suppl.pdf	partly
Other non-statutory designation	Moreton Bay hope spot	https://mission-blue.org/2017/08/citizen-scientist-nurture-the-moreton-bay-hope-spot/	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
Livestock management/exclusion (excluding fisheries)	Partially implemented
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
Fisheries management/regulation	Partially implemented

Other:

In Australia, the ecological character of Sites included in the List of Wetland of International Importance is protected as a Matter of National Environmental Significance (MNES) under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

Note that 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

Has a management effectiveness assessment been undertaken for the site? Yes No

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:

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

Is there a site-specific restoration plan? No need identified

Further information

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

A comprehensive list of monitoring programs relating to aquatic ecosystems, including those underway in the Site is provided on www.wetlandinfo.des.qld.gov.au.

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

This RIS has been prepared using information from relevant scientific documents, past Ramsar Information Sheets, and other key information sources.
A full bibliography is included as an attachment under Section 6.1.2 vi.

6.1.2 - Additional reports and documents

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

<no file available>

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

<no file available>

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

<no file available>

iv. relevant Article 3.2 reports

<no file available>

v. site management plan

<no file available>

vi. other published literature

<5 file(s) uploaded>

6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:



Blue Lake, Moreton Bay Ramsar Site (*Department of Environment and Science, 2018*)

North Stradbroke Island, Moreton Bay Ramsar Site (*Department of Environment and Science, 2018*)



Cooloola Sedgefrog (*Litoria cooloolensis*), Moreton Bay Ramsar Site (*Department of Environment and Science, 2018*)



North Stradbroke Island, Moreton Bay Ramsar Site (*Department of Environment and Science, 2018*)



North Stradbroke Island, Moreton Bay Ramsar Site (*Department of Environment and Science, 2018*)



North Stradbroke Island, Moreton Bay Ramsar Site (*Department of Environment and Science, 2018*)

6.1.4 - Designation letter and related data

Designation letter

<1 file(s) uploaded>

Date of Designation