Ramsar Information Sheet

Published on 25 March 2025
Update version, previously published on : 21 October 2002

Australia

Coral Sea Reserves

Designation date	21 October 2002
Site number	1222
Coordinates	17°07'03"S 150°45'16"E
Area	1 728 920,00 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 Coral Sea Ramsar site comprises the Coringa islets, Herald cays and Lihou reef. The site comprises near-pristine oceanic islet and reef habitats that are representative of the Coral Sea.

The site is part of the larger Coral Sea Marine Park, which was designated to protect representative examples of the region's ecosystems. The site is noted for its significant island and reef ecosystems, shallow and deep-water habitats. These habitats support a rich and diverse marine flora and fauna, characteristic of a major reef province, including potentially undescribed species.

The undisturbed sandy habitats at several islets are nesting sites for the globally endangered green turtle, while foreshores, forest and shrubland support important breeding populations of seabirds including terns, boobies and tropicbirds. Coral reef habitat supports distinct communities of marine flora and fauna, including a relatively rich diversity of crustacean and hydroid fauna, and significant feeding habitat for migratory seabirds.

The site meets Ramsar criteria 1, 2, 3, 4, 5, 7 and 8:

1: The site comprises near-pristine oceanic islet and reef habitats that are representative of the Coral Sea.

2: The site provides habitat for threatened species listed nationally (under the EPBC Act) and/ or internationally (under the IUCN Redlist), including the green and hawksbill turtle.

3: The site is considered a hotspot of biodiversity within the Coral Sea bioregion, due the presence of a range of reef and terrestrial habitats, including vegetated islets.

4: The sandy cays support breeding populations of green turtle. The vegetated islets provide important nesting sites for breeding seabirds.

5: Large numbers of breeding seabirds have been regularly recorded at the Site.

7: The site supports a diversity of fish species (over 390 coral reef species), from at least 54 families, representing a range of morphologies, reproductive types and life strategies.

8: The shallow reef and lagoons are likely to provide important spawning and/or nursery habitat for a range of species, including those that use deeper waters in their adult stages.

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 Climate Change, Energy, the Environment and Water
Postal address	GPO Box 3090 Canberra ACT 2601 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	2001
To year	2011

2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)	Coral Sea Reserves
Unofficial name (optional)	Coral Sea Reserves (Coringa-Herald and Lihou Reefs and Cays)

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 ○ No ◉
(Update) B. Changes to Site area	No change to area
(Update) For secretariat only: This update is an extension	☐

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?	Uncertain

(Update) Optional text box to provide further information

In early 2020, shallow reef habitats across the Coral Sea Marine Park experienced severe and widespread bleaching, with 63% of all corals surveyed across the Marine Park, and up to 89% of corals at individual reefs being bleached. Major bleaching events occurred in in 2016, 2017 and 2020, and are reflective of the increasing frequency and intensity of marine heatwaves that are affecting coral reefs globally (Hoey et al 2021).

Continued surveys of Marine Park reefs will be critical to assess the longer-term impacts of the 2020 bleaching event on reef fishes and other reef-associated species, and the potential recovery and resilience of these isolated reef systems in the absence of other stressors (Hoey et al 2021).

While there has been no notifiable change in ecological character, the site has been subject to a changing climate. Australia has warmed by an average of 1.47°C (higher than the global average of 1°C) since national records began in 1910, leading to an increased frequency of extreme heat events. Further increases in temperature are projected, with most extremely hot days and fewer extremely cool days under all emissions scenarios (BoM and CSIRO 2020). These conditions will affect the critical components, processes, and services of the Ramsar site and will test the site's resilience.

Climate projections and the information to guide wetland management under a changing climate is continually evolving. This and other relevant sections of the RIS will be reviewed and updated as significant advances are made.

2.2 - Site location

2.2.1 - Defining the Site boundaries

b) Digital map/image
<3 file(s) uploaded>

Former maps	0

Boundaries description

The Ramsar site is in the Coral Sea at latitude 25° 28' 46" S, longitude 152° 54' 9" E (centroid coordinates). It sits wholly within the Coral Sea Marine Park but does not include all of the Marine Park area.

The site comprises two components:
• the former Coringa-Herald National Nature Reserve. The boundary of this component of the site is described by a line which extends from 149°00‘E, 16°46‘S eastward to149°48‘E, 16°46‘S, then in a north-easterly direction to 150°12‘E, 16°23‘S, then eastward to 150°30‘E, 16°23‘S, then southward to 150°30‘E, 16°52‘S, then south-westward to 150°05‘E, 17°11‘S, then westward to 149°00‘E, 17°11‘S, then north to meet its origin. This area includes the Herald Cays (at 16° 58' S, 149° 08' E), Coringa Islets (at 16° 56' S, 150° 00' E) and Magdelaine Cays (at 16° 30' S, 150° 17' E).

• the former Lihou Reefs National Nature Reserve. The boundary of this component of the site is described by a line which extends from 151°08‘E, 17°21‘S in a north-easterly direction to 151°54‘E, 16°57‘S, then eastward to 152°20‘E, 16°57‘S, then southward to 152°20‘E, 17°27‘S, then south-westward to 151°08‘E, 17°54‘S, then north to meet its origin. It is a horseshoe-shaped line of cays and reefs that extends from Nellie (No.9) Cay to Licklick Cay.

2.2.2 - General location

a) In which large administrative region does the site lie? The Ramsar site is in the Coral Sea Islands Territory, an external Territory of Australia.

b) What is the nearest town or population centre? The centre of the Coringa Islets and Herald Cays is approximately 440km east of Cairns, Qld. Lihou reef is approximately 650km east-south-east of Cairns (Cairns population: 150,041 in 2016).

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): 1728920

Area, in hectares (ha) as calculated from GIS boundaries: 1728920.048

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Marine Ecoregions of the World (MEOW)	Southwest Pacific Province, Coral Sea Ecoregion
Other scheme (provide name below)	East Region, Northeast Provincial Bioregion, Australia

Other biogeographic regionalisation scheme

Commonwealth of Australia (2006). Integrated Marine and Coastal Regionalisation of Australia (IMCRA) Version 4 – East Region, Northeast provincial bioregion (https://parksaustralia.gov.au/marine/management/resources/scientific-publications/guide-integrated- marine-and-coastal-regionalisation-australia-version-40-june-2006-imcra/)

The Integrated Marine and Coastal Regionalisation of Australia (IMCRA v4.0) is a spatial framework for classifying Australia’s marine environment into bioregions that make sense ecologically and are at a scale useful for regional planning.

Note: the Marine Ecoregions of the Worldll (MEOW) classification system adopts Australia’s IMCRA Version 4.0 regionalisation, and refers to Australia‘s IMCRA “Northeast Province” as the “Coral Sea Ecoregion” which is grouped within the “Southwest Pacific” Province, which is part of the “Central Indo-Pacific” Realm (Spalding et al 2007).

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

Other reasons	The site includes several representative examples of coral reef (Ramsar wetland type C), including the sub-type “shelf-edge oceanic coral reef”. The site includes the largest and least disturbed examples of this sub-type within the northeast provincial bioregion. The Lihou reef formation is the largest of its type (at 2,500km2) in the bioregion. The reef communities within the Ramsar site are in near-pristine condition, with minimal evidence of human-disturbance. The reef communities display distinct differences to those of neighbouring bioregions. Several islets within the site include undisturbed sand-cay habitat (Ramsar wetland type E), which are nesting sites for green turtle. The site includes the only forested reef cays in the bioregion, making it an outstanding breeding site for seabirds and shorebirds.

☑ Criterion 2 : Rare species and threatened ecological communities

Optional text box to provide further information	The Ramsar site provides habitat for species listed as threatened nationally under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), and/ or internationally under the IUCN Red List. Threatened species that occur at the site include: • green turtle, Chelonia mydas (EPBC – vulnerable, IUCN – endangered) • hawksbill turtle, Eretmochelys imbricata (EPBC – vulnerable, IUCN – critically endangered) Green turtles breed on sandy islets of the Coringa-Herald cluster and on 11 cays of Lihou Reef. Hawksbill turtles have been sighted foraging within the Ramsar site but have not been observed nesting (Environment Australia 2002c). Fairy Terns, Sternula nereis nereis (EPBC – vulnerable, IUCN – vulnerable) have been sighted at the Coringa-Herald component of the Ramsar site, but are not considered common to the site (Phillips et al. 2006). Based on a 2021 report, it is possible that these were misidentified and were instead Caledonian fairy tern (Sternula nereis exsul), which is not listed as threatened (Chapman et al 2021).

☑ Criterion 3 : Biological diversity

Justification

The Ramsar site can be considered a 'hotspot' of biological diversity within the bioregion. Whilst there are no comprehensive inventories of the whole site, the limited scientific investigations to date have identified a diversity and abundance of species, including:

• 745 species of mollusc recorded at North-East Herald Cay (Loch 2001). Species at Lihou Reef is a knowledge gap.
• 294 species of fish recorded in the former Lihou Reef Reserve (DEH 2001).
• 342 species of fish recorded at the North-East Herald Cay (Oxley et al 2003).
• 125 species of decapod crustaceans (including 6 semi-terrestrial and terrestrial species) recorded at the North-East Herald Cay (Davie and Short 2001).
• 66 species of marine algae, including 41 species of red algae, 23 species of green algae and 2 of brown algae recorded in the former Coringa-Herald Reserve (Millar 2001).
• 55 species of hydroids recorded at North-East Herald Cay (Preker 2001).
• high densities of 6 species of holothurian (sea cucumbers) in the former Coringa-Herald and Lihou Reef Reserves (Oxley et al 2003).
• a diversity and abundance of sea sponges, with the following species occurring in the site's large "sponge gardens": Thorecta n. sp., Polyfibrospongia flabellifera, Phyllospongia n. subsp., Carteriospongia lamellosa, Carteriospongia n. sp., and C. pennatula (DEH 2001).
• a diversity and abundance of soft and hard corals, with 99 species of hard coral and 9 genera of soft coral recorded in the former Coringa-Herald Reserve (Oxley et al 2003); and 100 species of hard coral and 2 genera of soft coral recorded in the former Lihou Reef Reserve (Oxley et al 2004).
• 19 species of shorebirds and seabirds, 13 of which have been recorded breeding at the site. Pisonia grandis provides critical nesting habitat for some of these species.

The nesting population of green turtles within the site are considered to be a separate genetic stock compared to other green turtle populations. They have genetic affinities to the Great Barrier Reef and Torres Strait populations (DEH 2001), but with sufficient differences to be regarded as a separate genetic breeding stock or 'management unit' (Moritz et al 2002). Movements of this highly migratory species between these locations has been confirmed in tagging studies (Harvey et al 2005).

Reefs, islets and associated habitats in the site provide the only habitat for a diverse community of sedentary reef-inhabiting animals within an extensive area of deep ocean. However, the number of species of mollusc, decapod crustaceans, marine algae and hydroids likely to occur at Lihou Reef is a knowledge gap.

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

Optional text box to provide further information

The site provides important breeding habitat, and the reefs provide shelter for oceanic species during severe storms.

The sandy cays of the site support breeding colonies of green turtle. These nesting sites are almost completely free from disturbances such as artificial lighting, human beach use, pollution, feral animals and boat traffic compared to many nesting sites of the Great Barrier Reef.

The Ramsar site includes the only forested cays in the Coral Sea Islands Territory and supports breeding colonies of 13 seabird species (including boobies, frigatebirds, tropicbirds, and terns). While some of these species (such as the red-footed booby, reed-tailed tropicbird, great and lesser frigatebirds) have an extensive distribution outside of Australian waters, they are uncommon within Australia, and the Ramsar site contains a significant proportion of the region's breeding populations (Baker et al 2000 cited in DEH 2001). Most breeding commences at the end of the cyclone season (March-April) and continues during the cooler months. The colonies are important to the ecological balance of the Coral Sea region (DEH 2001), with seabirds gathering from an extensive oceanic 'catchment'.

A 2021 survey of the Lihou reef component of the Ramsar site recorded nests, chicks and/ or young of the following species at the site:
• buff-banded rail (Gallirallus philippensis tounelieri)
• common noddy (Anous stolidus)
• lesser frigatebird (Fregata ariel)
• brown booby (Sula leucogaster)
• masked booby (Sula dactylatra)
• red-footed booby (Sula sula)
• crested tern (Thalasseus bergii)
• sooty tern (Onychoprion fuscatus)
• black-naped tern (Sterna sumatrana)
• roseate tern (Sterna dougalli)
• New Caledonian fairy tern (Sternula nereis exsul)
(Chapman et al 2021).

The Herald Cays breeding population exceeds 500 pairs of red-tailed tropicbird (Phaethon rubricauda). This is the largest-known breeding population of this species in the Coral Sea and eastern Australia, and the second largest in Australia after Christmas Island in the Indian Ocean (Baker et al 2008; RGSQ 2001).

At least 8 species of migratory shorebird, including the Pacific golden plover (Pluvialis fulva) and ruddy turnstone (Arenaria interpres), use the site's reefs and cays as migration stop-over areas, in very small numbers (DEH 2001).

Reefs, islets and associated habitats in the site provide the only habitat for a diverse community of sedentary reef-inhabiting animals within an extensive area of deep ocean. Many of these species depend on these habitats to complete their whole life cycle.

☑ Criterion 5 : >20,000 waterbirds

Overall waterbird numbers: 20 000

Start year: 1992

End year: 2021

Source of data: Royal Geographical Society of Queensland 2001, Baker et al 2008, Chapman et al 2021

Optional text box to provide further information

Based on records from 1992 to 2021, the site regularly supports over 20,000 seabirds breeding on North East Herald Cay (NEH), South West Herald Cay (SWH) and islets and cays of Lihou Reef (RGSQ 2001, Baker et al 2008, Chapman et al 2021). Species that contribute to this total include:
• lesser frigatebird (Fregata ariel) and great frigatebird (Fregata minor): stable population of around 200 pairs in Argusia shrubland and 3,000 pairs in Pisonia/ Cordia forest on NEH (1992-1997). These species have been grouped together as identification to species level during nesting is difficult. Also recorded breeding at Lihou Reef (see below).
• red-footed booby (Sula sula): relatively stable population of around 300 pairs in Argusia shrubland and 1,000 pairs in Pisonia/ Cordia forest on NEH. Also recorded breeding at Lihou Reef.
• brown booby (Sula leucogaster): a breeding visitor to NEH (10 birds recorded in 1997). Recorded in higher numbers at Lihou Reef.
• masked booby (Sula dactylatra): present at NEH in limited numbers (53 birds recorded in 1997). Recorded in higher numbers at Lihou Reef.
• black noddy (Anous minutus): stable population with nest counts of around 20,000 (1992 – 1997) on NEH. This species does not breed on SWH as Pisonia/ Cordia forest habitat is not present.
• red-tailed tropicbird (Phaethon rubricauda): population appears to be stable at 200 to 250 pairs (1992-2007).
• common noddy (Anous stolidus): recorded breeding in “moderate” numbers on NEH (RGSQ 2001).
• sooty tern (Onychoprion fuscatus): not recorded breeding on NEH but noted to breed in large numbers on SWH (RGSQ 2001). Recorded in high numbers at Lihou Reef.
• black-naped tern (Sterna sumatrana): recorded breeding at Lihou Reef.
• crested tern (Thalasseus bergii): recorded breeding at Lihou Reef.
• roseate tern (Sterna dougalli): recorded breeding at Lihou Reef.

The following count data was recorded from the 2007 survey of NEH and SWH (Baker et al 2008):
• red-footed booby: 1525 nesting pairs on NEH and 839 pairs on SWH.
• lesser and great frigatebird: 1794 nesting pairs on NEH (approximately 52% of which were great frigatebirds) and 215 nesting pairs of great frigatebirds (only) on SWH.
• red-tailed tropicbird: 174 pairs on NEH and 215 pairs on SWH
• masked booby: 10 pairs on NEH and 35 pairs on SWH
• black noddy: 22,373 nests.
Note the 2007 survey did not include Lihou Reef.

The following count data was recorded from the 2021 survey of Lihou Reef (Chapman et al 2021):
• terns: 48,746 breeding pairs (mostly sooty tern, but also black-naped, crested, and roseate tern)
• boobies: 1,160 breeding pairs (including brown, masked, and red-footed booby)
• lesser frigate bird: 837 breeding pairs
• brown noddy: 7,461 breeding pairs
• 52 breeding pairs of New Caledonian fairy terns (Sternula nereis exsul). This was the first time that nests and chicks of this species were recorded at the site.
Note the 2021 survey did not include Coringa-Herald (NEH and SWH).

☑ Criterion 7 : Significant and representative fish

Justification

Whilst there is not a complete an inventory of fish species at the site, based on past surveys, the site is important for maintaining species diversity within the Coral Seas bioregion.

At least 390 species of coral reef fish (from at least 54 families) occur across the site. 342 species have been recorded from North-East Herald Cay (Oxley et al 2003) and 390 species from Lihou Reef (Ayling & Ayling 1985 and Oxley et al 2004). A 2007 survey recorded 326 species of non-cryptic, diurnal reef fish (Ceccarelli et al 2008). Surveys of cryptic fauna would likely result in a much higher estimate of species richness.

The six families represented by the greatest number of species were Labridae (wrasses), Pomacentridate (damselfish), Acanthuridae (surgeonfish), Chaetodontidae (butterfly fish), Serranidae (cods and coral trout) and Scaridae (parrotfish) (Ayling & Ayling 1985). Fish fauna at the site includes a diverse range of morphologies, reproductive types, and life strategies. This is made possible by the diversity of reef geomorphological zones and habitat types at the site.

Life forms and life strategies present at the site include benthic, demersal, pelagic, herbivorous, omnivorous, predatory, planktivorous, scavenging, symbiotic, live-bearing, egg-releasing, hermaphroditic protogyny and protandry. Several of these groups are present in high abundance.

The marine faunal assemblage of the site is distinctive in several ways:
• Sponges (family Spongiidae) form an important part of the reef fauna and are often more abundant than coral (in contrast to the shallow reef areas of the Great Barrier Reef and other sites in the western Pacific).
• Decapod crustacean and hydroid faunas are relatively rich.
• Some species of fish that are common at the Ramsar site are rare or absent from the nearby Great Barrier Reef (and vice versa).

Commonly occurring sponges in the site's large sponge gardens include Thorecrta n. sp., Polyfibrospongia flabellifera, Phyllospongia n subsp., Carteriospongia lamellosa, Carteriospongia n. sp, and Cateriospongia pennatula.

The marine molluscan fauna is moderately rich and represents a subset of a more widely distributed tropical molluscan fauna. A 1997 survey (Loch 2001) recorded 717 species of mollusc. Two species, Rissopsis typica and Cypraea childrei, were quite common at the site, despite being rare over much of the rest of their range (DEH 2001). There have not been any more recent comprehensive surveys of molluscs to compare against these figures.

The fish communities of the Coral Sea Ramsar site support a diverse and complex range of other ecosystem components and processes, including multiple food webs, re-cycling and breakdown of coralline materials, algal grazing, and symbiotic relationships.

☑ Criterion 8 : Fish spawning grounds, etc.

Justification

The shallow reefs and lagoons within the site are likely to provide important spawning and nursery habitat for fish species, as well as providing habitat for the whole life cycle of some species. The site may provide larval recruits to other nearby reef systems. The shallow areas of the site are likely to support populations of prey species for pelagic and oceanic predators, and act as aggregation areas for oceanic and migratory species such as yellow-fin tuna (Thunnus albacares) and big-eye tuna (Thunnus obesus).

Whilst hard corals cover a relatively small proportion of the reef area compared to other reef ecosystems, the presence of Pacific Ocean corals supports the suggestion that the Coral Sea reefs provide a pathway for the dispersal of species between the Great Barrier Reef and Pacific Ocean reefs (Oxley et al 2003, Ceccarelli et al 2008). The dominant hard corals at the site are Acropora palifera (Isopora palifera), Acroporahumilis and Poecilopora spp. The dominant soft corals are Sarcophyton sp.

Marine algal communities are an important ecological feature of the site, frequently covering a greater area than the corals. These communities are likely to provide habitat and food sources for other species, and form part of food webs within the Ramsar site. During a 1997 preliminary survey of marine algae of North East (Herald) Cay, 66 species were recorded (41 species of red algae, 23 of green and 2 of brown). The near absence of brown algae is unusual for a typical reef environment DEH 2001).

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	*Pisonia grandis*	☐	☑	☐		☐		This species provides critical nesting habitat for seabirds. This forest ecosystem is relatively uncommon within Australia and globally. Only 2 forested cays remain within the Coral Island Sea Territory.

The Pisonia grandis forest ecosystem is relatively uncommon in Australia and globally, despite having an extensive Indo-Pacific distribution. Throughout much of its range, P. grandis forests have been cleared for subsistence agriculture and guano mining. Remaining examples are known from only 44 of about 950 islands within the Great Barrier Reef region and the species is rare on reef islands in the north of this region, where it does not generally form monospecific stands. In this context, the P. grandis forests of the Ramsar site are of intrinsic value.

There are only two Pisonia grandis forested cays within the Coral Sea Island Territory (North East Herald and South East Magdelaine). Pisonia forest formerly occurred on Coringa South West Islet (approx. 16 ha). This was destroyed between 1993 and 2000, presumably due to infestation of soft scale insect (Pulvinaria urbicola). Pisonia forest does not occur within the Lihou Reef part of the Site.

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																	
PORIFERA / DEMOSPONGIAE	*Carteriospongia flabellifera*	☐	☑	☐	☐	☑	☐	☑	☐					☐	☐		This species forms part of the site's large sponge gardens, and contributes to the biological diversity of the site. The sponge gardens provide important habitat for other species dependent on the site (e.g. feeding habitat for hawksbill turtle and a range of fish species).

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								
PORIFERA / DEMOSPONGIAE	*Carteriospongia pennatula*	☐	☑	☐	☐	☑	☐	☑	☐					☐	☐		This species forms part of the site's large sponge gardens, and contributes to the biological diversity of the site. The sponge gardens provide important habitat for other species dependent on the site (e.g. feeding habitat for hawksbill turtle and a range of fish species).
CHORDATA / REPTILIA	*Chelonia mydas*	☑	☑	☐	☐	☑	☐	☐	☐				EN	☑	☑	Nationally listed (EPBC) - vulnerable	Nationally and internationally listed threatened species. The site provides nesting habitat for this species. Green turtles breeding at the site represent a separate genetic stock from those found in the Great Barrier Reef and Torres Strait.
CHORDATA / REPTILIA	*Eretmochelys imbricata*	☑	☑	☐	☐	☐	☐	☐	☐				CR	☑	☑	Nationally listed (EPBC) - vulnerable	Nationally and internationally listed threatened species. This species has been recorded from the site but does not appear to breed here. The sponge gardens within the site provide key feeding grounds for this species.
CNIDARIA / ANTHOZOA	*Isopora palifera*	☐	☐	☐	☐	☐	☐	☑	☑				NT	☐	☐		Hard corals such as Isopora palifera (Acropora palifera) provide spawning and nursery habitat for fish and other species, and contribute to the biological diversity of the site.
PORIFERA / DEMOSPONGIAE	*Phyllospongia lamellosa*	☐	☑	☐	☐	☑	☐	☑	☐					☐	☐		This species forms part of the site's large sponge gardens, and contributes to the biological diversity of the site. The sponge gardens provide important habitat for other species dependent on the site (e.g. feeding habitat for hawksbill turtle and a range of fish species).
Fish, Mollusc and Crustacea																	
CHORDATA / ACTINOPTERYGII	*Acanthurus dussumieri*	☐	☐	☐	☐	☐	☐	☑	☑				LC	☐	☐		This species represents one of the morphologies/ reproductive types/ life strategies found at the site. Acanthurus dussumieri is an example of a deep-bodied, laterally compressed oval fish (compressiform). Juveniles and young adults are mostly associated with reef habitats. Adults occur at depths to 130m.
CHORDATA / ELASMOBRANCHII	*Carcharhinus amblyrhynchos*	☑	☐	☐	☐	☐	☐	☑	☑				EN	☐	☐		Internationally listed threatened species. This species represents one of the morphologies/ reproductive types/ life strategies found at the site. It is viviparous, with 4-6 pups born every two years. This species inhabits reef environments for its whole life, and is mostly found in depths less than 60 m. They are frequently found near the drop-offs at the outer edges of the reef.
CHORDATA / ACTINOPTERYGII	*Chaetodon citrinellus*	☐	☐	☐	☐	☐	☐	☑	☑				LC	☐	☐		This species represents one of the morphologies/ reproductive types/ life strategies found at the site. This species is oviparous and forms pairs during breeding. Juveniles and adults are common in shallow reef habitats, occasionally to depths of 36m.
CHORDATA / ACTINOPTERYGII	*Cheilinus undulatus*	☑	☐	☐	☐	☐	☐	☑	☑				EN	☐	☐		Internationally listed threatened species. This species represents one of the morphologies/ reproductive types/ life strategies found at the site. Cheilinus undulatus is an example of fusiform morphology, with adults developing a large hump on the forehead. Juveniles typically inhabit shallower inshore areas, whilst adults are mostly found in deeper waters on outer reef slopes and channels.
MOLLUSCA / GASTROPODA	*Ipsa childreni*	☐	☐	☐	☐	☑	☐	☑	☐					☐	☐		This species is quite common at the site despite being rare over much of the rest of its range. It contributes to the biodiversity of mollusc biota at the site (745 species of mollusc recorded 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 / ACTINOPTERYGII	*Plectropomus laevis*	☐	☐	☐	☐	☐	☐	☑	☑				LC	☐	☐		This species represents one of the morphologies/ reproductive types/ life strategies found at the site. They are monandric protogynous hermaphrodites, in which the males develop from mature females. This species is found in lagoon areas and on the seaward side of reefs where it appears to prefer reef channels and the outer shelf of the reef.
MOLLUSCA / GASTROPODA	*Rissopsis typica*	☐	☐	☐	☐	☑	☐	☑	☐					☐	☐		This species is quite common at the site despite being rare over much of the rest of its range. It contributes to the biodiversity of mollusc biota at the site (745 species of mollusc recorded at the site)
CHORDATA / ACTINOPTERYGII	*Scarus altipinnis*	☐	☐	☐	☐	☐	☐	☑	☑				LC	☐	☐		This species represents one of the morphologies/ reproductive types/ life strategies found at the site. This species is oviparous and forms distinct pairs to spawn. Adults and subadults form groups, whilst juveniles are usually solitary. The adults are normally recorded along the reef margin of seaward reefs whereas the juveniles and subadults inhabit shallow protected reefs. It feeds mainly on algae.
CHORDATA / ACTINOPTERYGII	*Thunnus albacares*	☐	☐	☐	☐	☐	☐	☑	☑				LC	☐	☐		The site may act as an aggregation area for this species. This species represents one of the morphologies/ reproductive types/ life strategies found at the site.
CHORDATA / ACTINOPTERYGII	*Thunnus obesus*	☑	☐	☐	☐	☐	☐	☑	☑				VU	☐	☐		Internationally listed threatened species. The site may act as an aggregation area for this species. This species represents one of the morphologies/ reproductive types/ life strategies found at the site.
MOLLUSCA / BIVALVIA	*Tridacna maxima*	☐	☑	☐	☐	☑	☐	☐	☐				NT	☐	☐		The site potentially supports a number of clam species, including some or all of the following: Tridacna maxima, Tridacna squamosa, Tridacna derasa, Tridacna crocea, Hippopus hippopus, and/or Tridacna gigas. The diversity of clam species supported by the site is a knowledge gap.
CHORDATA / ACTINOPTERYGII	*Zanclus cornutus*	☐	☐	☐	☐	☐	☐	☑	☑				LC	☐	☐		This species represents one of the morphologies/ reproductive types/ life strategies found at the site. It has a distinctively compressed disk-like body, tubular snout and an elongated, sickle-shaped dorsal fin. It is a pelagic spawner (eggs and sperm are released into the water column), with a long pelagic larval stage.
Birds																	
CHORDATA / AVES	*Anous minutus*	☐	☑	☐	☐	☑	☑	☐	☐	20000	1992 to 1997		LC	☐	☐		The site provides breeding habitat for this species. This species was recorded breeding in large numbers between 1992 and 1997at North East Herald Cay. A 2007 survey recorded 22,373 nests at North East Herald Cay. This species contributes to the biological diversity of the site.
CHORDATA / AVES	*Anous stolidus*	☐	☑	☐	☐	☑	☑	☐	☐	7461	2021		LC	☐	☐	Nationally listed (EPBC) - migratory species	The site provides breeding habitat for this species. A 2021 survey recorded 7,461 breeding pairs at Lihou Reef. This species contributes to the biological diversity of the site.
CHORDATA / AVES	*Arenaria interpres*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	Nationally listed (EPBC) - migratory species	This species uses the site as a migration stop-over. This species contributes to the biological diversity 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	*Fregata ariel*	☐	☑	☐	☐	☑	☑	☐	☐	753	2007		LC	☐	☐	Nationally listed (EPBC) - migratory species	The site provides breeding habitat for this species. A 2007 survey recorded 1794 nesting pairs of great and lesser frigatebirds at North East Herald Cay. Approximately 48% were identified as lesser frigatebirds (753 pairs). 215 pairs were recorded on South West Herald Cay. A 2021 survey recorded 837 breeding pairs at Lihou Reef. This species contributes to the biological diversity of the site.
CHORDATA / AVES	*Fregata minor*	☐	☑	☐	☐	☑	☑	☐	☐	932	2007		LC	☐	☐		The site provides breeding habitat for this species. A 2007 survey recorded 1794 nesting pairs of great and lesser frigatebirds at North East Herald Cay. Approximately 52% were identified as great frigatebirds (932 pairs). This species contributes to the biological diversity of the site.
CHORDATA / AVES	*Gallirallus philippensis tounelieri*	☐	☑	☐	☐	☑	☐	☐	☐					☐	☐		The site provides breeding habitat for this species. This species contributes to the biological diversity of the site.
CHORDATA / AVES	*Numenius phaeopus*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	Nationally listed (EPBC) - migratory species	This species may use the site as a migration stop-over. This species contributes to the biological diversity of the site.
CHORDATA / AVES	*Onychoprion fuscatus*	☐	☑	☐	☐	☑	☑	☐	☐	48260	2021		LC	☐	☐		The site provides breeding habitat for this species. A 2021 survey recorded 48,746 breeding pairs of terns at Lihou Reef. These were mostly sooty tern (48,260), but also included black-naped tern (470), crested tern (12), and roseate tern (4). This species contributes to the biological diversity of the site.
CHORDATA / AVES	*Phaethon rubricauda*	☐	☑	☐	☐	☑	☑	☐	☐	389	2007		LC	☐	☐		The site provides breeding habitat for this species. In 2007, 174 breeding pairs were recorded on NEH and 215 pairs on SWH. This species contributes to the biological diversity of the site.
CHORDATA / AVES	*Pluvialis fulva*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	Nationally listed (EPBC) - migratory species	This species may use the site as a migration stop-over. This species contributes to the biological diversity of the site.
CHORDATA / AVES	*Sterna dougallii*	☐	☑	☐	☐	☐	☑	☐	☐	4	2021		LC	☐	☐		The site provides breeding habitat for this species. A 2021 survey recorded 48,746 breeding pairs of terns at Lihou Reef. These were mostly sooty tern (48,260), but also included black-naped tern (470), crested tern (12), and roseate tern (4). This species contributes to the biological diversity of the site.
CHORDATA / AVES	*Sterna sumatrana*	☐	☑	☐	☐	☑	☑	☐	☐	470	2021		LC	☐	☐	Nationally listed (EPBC) - migratory species	The site provides breeding habitat for this species. A 2021 survey recorded 48,746 breeding pairs of terns at Lihou Reef. These were mostly sooty tern (48,260), but also included black-naped tern (470), crested tern (12), and roseate tern (4). This species contributes to the biological diversity of the site.
CHORDATA / AVES	*Sternula nereis*	☑	☐	☐	☐	☐	☐	☐	☐				VU	☐	☐	Nationally listed (EPBC) - vulnerable	Nationally and internationally listed threatened species. This species was previously recorded at the site, but it is unclear which subspecies was sighted. In Australia, only the Australian fairy tern subspecies (Sternula nereis nereis) is listed as threatened. This sighting could instead have been the New Caledonian fairy tern, as there are records for this subspecies on Lihou Reef.
CHORDATA / AVES	*Sternula nereis exsul*	☐	☑	☐	☐	☑	☐	☐	☐	52	2021			☐	☐		The site provides breeding habitat for this species. In 2021, 52 breeding pairs of New Caledonian fairy terns were recorded at Lihou Reef. This was the first time that nests and chicks of this species were recorded at the site. This species contributes to the biological diversity 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	*Sula dactylatra*	☐	☑	☐	☐	☑	☑	☐	☐	35	2007		LC	☐	☐		The site provides breeding habitat for this species. In 2007, 10 breeding pairs were recorded on NEH and 35 pairs on SWH. A 2021 survey recorded 1,160 breeding pairs of boobies at Lihou Reef, including brown, masked, and red-footed booby. This species contributes to the biological diversity of the site.
CHORDATA / AVES	*Sula leucogaster*	☐	☑	☐	☐	☑	☑	☐	☐				LC	☐	☐		The site provides breeding habitat for this species. A 2021 survey recorded 1,160 breeding pairs of boobies at Lihou Reef, including brown, masked, and red-footed booby. This species contributes to the biological diversity of the site.
CHORDATA / AVES	*Sula sula*	☐	☑	☐	☐	☑	☑	☐	☐	1525	2007		LC	☐	☐		The site provides breeding habitat for this species. In 2007, 1525 nesting pairs were recorded on NEH and 839 pairs on SWH. A 2021 survey recorded 1,160 breeding pairs of boobies at Lihou Reef, including brown, masked, and red-footed booby. This species contributes to the biological diversity of the site.
CHORDATA / AVES	*Thalasseus bergii*	☐	☑	☐	☐	☑	☐	☐	☐	12	2021		LC	☐	☐	Nationally listed (EPBC) - migratory species	The site provides breeding habitat for this species. A 2021 survey recorded 48,746 breeding pairs of terns at Lihou Reef. These were mostly sooty tern (48,260), but also included black-naped tern (470), crested tern (12), and roseate tern (4). This species contributes to the biological diversity of the site.
CHORDATA / AVES	*Tringa incana*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	Nationally listed (EPBC) - migratory species	This species may use the site as a migration stop-over. This species contributes to the biological diversity of the site.

1) Percentage of the total biogeographic population at the site

The fish species listed in the table above are an example of the variety of species recorded at the site during a 2003 marine survey of the site. A full species list is included in the appendix to Oxley et al 2003 (copy attached to this RIS update).

Bird counts and breeding information used in the table above is based on RGSQ (2001) and Baker et al (2008) for the Coringa Herald component of the site, and Chapman et al (2021) for the Lihou Reef component. Baker et al (2008) noted that identification to species level for the great frigatebird and lesser frigatebird during nesting is difficult unless a parent is attending the nest. As such, identification to the species level may be an estimate. Based on data collected between 1999 and 2007, it is estimated that approximately 40% of the frigatebirds breeding were great frigatebirds, and the rest were lesser frigatebirds.

The 2007 bird survey (Baker et al 2008) was undertaken in August and collected data about black noddy nests as an adjunct to the main study (as this species was not an intended subject of the main study). These nest counts do not directly equate to the number of breeding pairs, as the black noddy often builds a series of nests during courtship, not all of which are used. Breeding for this species is likely to commence in late autumn/ early winter (May/ June) and has finished by September each year. As such, many of the nests would have been empty at the time of the survey.

Large numbers of green turtles arrive between October and April to nest on the sandy cays of the Coral Sea Marine Park. Use of the site by Hawksbill turtles is a knowledge gap.

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
Pisonia grandis forest	☐		Provides critical habitat for seabird nesting.

Optional text box to provide further information

Whilst not listed nationally as a threatened ecological community, the Pisonia grandis forest ecosystem is considered a critical component of the Ramsar site.

Pisonia grandis forest is relatively uncommon in Australia and globally and has been cleared throughout much of its range. Remaining examples are known from only 44 of about 950 islands within the Great Barrier Reef region, and the species is rare on reef islands in the north of this region, where it does not generally form monospecific stands. The Pisonia grandis forests of the Ramsar site are therefore of intrinsic value and play a significant role as habitat for nesting seabirds.

Within the Ramsar site, Pisonia grandis forest occurs on only two cays: North East Herald Cay and South East Magdelaine Cay. Pisonia grandis forest formerly occurred on Coringa South West Islet (16 ha) but was destroyed between 1993 and 2000 due to a heavy infestation of soft scale Pulvinaria urbiccola (Smith et 2004).

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

4.1 - Ecological character

The critical components and processes that support the ecosystem services of the site are:

• available habitats, geomorphology and substrates: the site comprises a range of marine habitats, including reefs, islets and cays. The Coringa-Herald system includes three separate platform reef systems, each at a different stage of reef formation. Islets and cays supported by these reefs are Herald Cay (South West Cay, North East Cay), Coringa Islets (Chilcott Islet, South West Islet) and Magdelaine Cays (North West Islet, Couth East Cay). The islets and cays are composed of sand, rock and coral rubble, and range from 16 to 37 ha in size. Each has a fringing coral reef fully exposed to the influences of oceanic currents and swells. Reef flats are up to 4m deep and composed of turf and coralline algae along with sponges, soft and hard corals. Lihou Reef includes the largest reef structure in the Coral Sea. The reef forms an incomplete loop with 18 small sand cays along its edge. Lihou Reef is separated from the Coringa-Herald system by deep ocean.

The marine algal beds and reef zones within the Ramsar site provide feeding habitat for two species of turtle, numerous species of fish, marine molluscs, crustaceans, hydroids and bêche-de-mer. The hard and persistent substrate of the atolls provides a stable platform for the colonization of coral and algae species.

There are some vegetated cays within the site, which provide terrestrial habitat. This diversity of habitat supports a wide variety of species and communities.

• food sources and productivity: The highly productive ecosystems at the site provide the wide range of food sources necessary to support a diversity of fish and other species, including algae, corals, sponges, crustaceans, molluscs, echinoderms and fish.

• water quality and temperature: water quality aspects such as temperature, turbidity, nutrient concentrations and potential contaminants influence the biota at the site. The low-nutrient, clear water of this area allows maximum light penetration and supports the growth of submerged flora (macroalgae and seagrass). Coringa-Herald and Lihou Reefs experience annual sea surface temperatures ranging from approximately 24°C to 29 °C. Higher sea surface temperatures have been recorded regularly from 1999 onwards, resulting in periods of extensive coral bleaching.

• terrestrial vegetation including Pisonia forest: this forest ecosystem supports large rookeries of seabirds including red-footed boobies, lesser and great frigatebirds, common and black noddies. The islets within the Ramsar site include the only forested cays in the Coral Sea Islands Territory. The islets provide habitat for 16 or more species of vascular plants, which in turn provide nesting and roosting habitat for birds.

(Phillips et al 2006)

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
C: Coral reefs	Examples include Lihou Reef, Herald Cays, Coringa Islets, and Magdelaine Cays	1		Representative
E: Sand, shingle or pebble shores	Examples include Herald Cays such as South West Cay and North East Cay.	2		

(ECD) Habitat connectivity	Oceanic currents provide connectivity between the reefs of the site with the Great Barrier Reef and Pacific Ocean reefs.

4.3 - Biological components

4.3.1 - Plant species

Other noteworthy plant species

Phylum	Scientific name	Position in range / endemism / other
TRACHEOPHYTA/MAGNOLIOPSIDA	*Cordia subcordata*	Provides nesting habitat for seabirds. IUCN - least concern (decreasing)
TRACHEOPHYTA/MAGNOLIOPSIDA	*Heliotropium foertherianum*	Provides nesting habitat for seabirds. IUCN - least concern

Optional text box to provide further information

Noteworthy flora:
Sandy islets in Coringa-Herald support important stands of Argusia argentea (synonym of Heliotropium foertherianum) (a littoral shrub) and Cordia subcordata (a tree), which have been extensively cleared throughout much of their range.

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/AVES	*Egretta sacra*				This species breeds at the site.
CHORDATA/AVES	*Porphyrio porphyrio*				This species breeds at the site.
CHORDATA/AVES	*Puffinus pacificus*				Non-waterbird species that breeds at the site in large numbers.

Invasive alien animal species

Phylum	Scientific name	Impacts	Changes at RIS update
ECHINODERMATA/ASTEROIDEA	*Acanthaster planci*	Potential	unknown
ARTHROPODA/INSECTA	*Hippotion velox*	Potential	unknown
ARTHROPODA/INSECTA	*Pulvinaria urbicola*	Actual (major impacts)	unknown

Optional text box to provide further information

Other noteworthy fauna:
• Three non-colonial waterbirds eastern reef egret (Egretta sacra), buff-banded rail (Gallirallus philippensis tournelieri) and purple swamphen (Porphyrio porphyrio) breed at the site (Royal Geographical Society of Queensland 2001).
• Non-waterbirds that use the site include 60,000 to 130,000 breeding pairs, of Wedge-tailed Shearwater (Puffinus pacificus), which breed at the site annually (Royal Geographical Society of Queensland 2001).
• The marine faunal assemblage of the site is distinctive:
- sponges (family Spongiidae) form an important part of the reef fauna and often are more abundant than coral, in marked contrast to the shallow reef areas of the Great Barrier Reef.
- hard corals cover a relatively small proportion of reef area compared to the hard corals of the Great Barrier Reef and other sites in the western Pacific.
- the decapod crustacean and hydroid faunas are relatively rich.
- some species of fish that are common in the site are rare or absent from the Great Barrier Reef, and vice versa.
- Two species of marine mollusc, Rissopsis typica and Cypraea childreni, are quite common at the site despite being rare over much of the rest of their range (DEH 2001).
• The presence of Pacific Ocean corals supports the theory that the Coral Sea reefs provide stepping-stones for the dispersal of species between the Great Barrier Reef and Pacific Ocean reefs (Oxley et al 2003; Ceccarelli et al 2008). The dominant hard corals of the Site are Acropora palifera, A. humilis and Poecilopora spp. and the dominant soft corals are Sarcophyton sp.
• Commonly occurring sponges in the site's large sponge gardens include Thorecta n. sp., Polyfibrospongia flabellifera, Phyllospongia n. subsp., Carteriospongia lamellosa, Carteriospongia n. sp., and C. pennatula. Phyllospongia pennatula is common at Chilcott Islet.

Invasive species:
• Scale insect (Pulvinaria urbicola): the former Pisonia forest of South West (Coringa) Islet was extensively damaged (reduced to herbfield) by an outbreak of scale insect in 1991. Scale insect attack is now monitored.
• Hawkmoths (Hippotion velox): have the potential to cause defoliation in the Pisonia forest, which could impact seabird nesting.
• Crown of thorns starfish (Acathaster planci): several individuals of this species have been observed within the site. They may not occur in numbers sufficient to cause disturbance to the reef fauna.

4.4 - Physical components

4.4.1 - Climate

Climatic region	Subregion
A: Tropical humid climate	Af: Tropical wet (No dry season)

There is little variation in daily or annual temperatures at the Ramsar site. Data from Willis Islets (northwest of the site) indicate mean daily temperatures during December to January range from 25°C (min) to 31°C (max); and 22°C to 26°C for August (Bureau of Meteorology 2009). Mean annual rainfall is 1125mm (Bureau of Meteorology 2009) with 68% falling from January to April (RGSQ 2001).

The site has been subject to a changing climate. Australia has warmed by 1.4°C since 1910, with most warming since 1950. Further temperate increases are projected, with more extremely hot days and fewer extremely cool days over the coming decades under all emissions scenarios. Around Australia, oceans have warmed by around 1°C since 1910, with longer and more frequent marine heatwaves. Sea levels are rising, increasing the risk of inundation, and the oceans are acidifying. These conditions will affect the components, processes and services of the site and test its adaptive capacity (BOM 2018).

4.4.2 - Geomorphic setting

a) Minimum elevation above sea level (in metres): -5

a) Maximum elevation above sea level (in metres): 5

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.

The Ramsar site lies within the Coral Sea, to the east of the Australian continent.
The Ramsar site comprises coralline reef materials on a carbonate oceanic platform (the Queensland Plateau). The reefs are likely to have formed since the last ice age, keeping pace with rising sea levels.
The marine habitats present in the shallower areas of both reef systems are front (windward) reef slopes, exposed reef crests/ rims, reef flats, back (leeward) reef crests, back reef slopes, reef shoals and inter-reef channels. Lihou Reef has a lagoon habitat formed within the U-shaped structure of the reef system. Detailed information about the deeper lagoon habitats is not available.

4.4.3 - Soil

Mineral ☑

(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)

The site comprises calcareous sediments, derived in-situ from biogenic origins. Biogenic reef substrates form the basis of the reef habitats (Ceccarelli et al 2008). Biogenic calcareous sands contribute to the formation of sand cays and islets on several reefs. The calcareous soils on the vegetated islands are classified as “Inceptic Coral Calcarosols” (Batianoff et al 2008) under the Australian soils classification system (McKenzie et al 2004).

4.4.4 - Water regime

Water permanence

Presence?	Changes at RIS update
Usually permanent water present	No change

Source of water that maintains character of the site

Presence?	Predominant water source	Changes at RIS update
Marine water	☑	No change
Water inputs from precipitation	☐	unknown

Water destination

Presence?	Changes at RIS update
Marine	No change

Stability of water regime

Presence?	Changes at RIS update
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:

The oceanic location influences the hydrological forces affecting the Ramsar site. Tidal range is approximately 2m. Although information on oceanic currents in the area is limited, there is evidence that westward currents operate for most of the year, bringing propagules and larvae from islands of the western Pacific to the Coral Sea. During June to September, northward currents dominate and may assist the dispersal of biota and nutrients from the Great Barrier Reef to the Coral Sea (Brinkman et al 2001, Smith 1994). These currents are important for the dispersal of biota and the transfer of nutrients.

(ECD) Connectivity of surface waters and of groundwater: Not applicable.

(ECD) Stratification and mixing regime: The waters are a mix of warm, moderately saline equatorial water and cooler, more saline sub-tropical water. Salinity and temperature characteristics are believed to be important for coral development.

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 ☑

(ECD) Light - reaching wetland	Water is low-nutrient and clear, allowing maximum light penetration and supporting the growth of submerged flora.
(ECD) Water temperature	The waters are a mix of warm equatorial water and cooler sub-tropical water.

4.4.6 - Water pH

Unknown ☑

4.4.7 - Water salinity

Euhaline/Eusaline (30-40 g/l) ☑

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

Unknown ☐

Please provide further information on salinity (optional):

The waters are a mix of warm, moderately saline equatorial water and cooler, more saline sub-tropical water. Salinity is constant at about 35.2 parts per thousand. Salinity and temperature characteristics are believed to be important for coral development.

4.4.8 - Dissolved or suspended nutrients in water

Oligotrophic ☑

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

Unknown ☐

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

The oligotrophic waters of the Coral Sea support relatively low phytoplankton populations. (Oxley et al 2003).

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 Ramsar site lies in the remote oceanic environment on the Coral Sea Plateau. The area immediately adjacent to the Ramsar site forms part of the Coral Sea Marine Park, which covers 989,836 km2. The Coral Sea Marine Park is zoned, with some zones managed for conservation, whilst other zones allow for industries such as commercial fishing and shipping.

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)	Medium

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Nature observation and nature-based tourism	Low
Recreation and tourism	Water sports and activities	Low
Spiritual and inspirational	Cultural heritage (historical and archaeological)	Medium
Spiritual and inspirational	Aesthetic and sense of place values	Low
Scientific and educational	Important knowledge systems, importance for research (scientific reference area or site)	Medium

Supporting Services

Ecosystem service	Examples	Importance/Extent/Significance
Biodiversity	Supports a variety of all life forms including plants, animals and microorganizms, the genes they contain, and the ecosystems of which they form a part	Medium

Optional text box to provide further information

The critical ecosystem services of the Coral Sea Ramsar site are:

• represents a unique ecosystem in the bioregion (oceanic islets and associated reefs): the site is comprised of a series of oceanic islets with associated reefs, occurring on the Coral Sea (Queensland) Plateau. They represent one of the largest carbonate platforms in the ocean and are the dominant feature of the site.

• supports threatened marine turtles: the Ramsar site includes habitat that supports significant populations of green turtles and populations of hawksbill turtle. Green turtles nest regularly at the site, whilst hawksbill turtles forage in the reef areas surrounding islets within the site.

• supports species diversity and abundance: the site supports a diversity of marine species including fish, molluscs, decapod crustaceans, hydroids, bêche-de-mer, sponges, soft and hard corals and marine algae. Preliminary surveys of the site indicate that fish families with the greatest species diversity are Labridae (wrasses), Pomacentridae (damselfish), Acanthuridae (surgeonfish), Chaetodontidae (butterfly fish), Serranidae (cods and coral trout) and Scaridae (parrotfish). Some of the fish species common at the site are rare or absent from the Great Barrier reef and vice versa.

• supports significant forest of Pisonia grandis in the bioregion: the site includes the only forested cays in the Coral Sea Territory. This ecosystem provides critical habitat for seabird breeding.

• supports animal taxa at a vulnerable or critical stage of their lifecycle: this includes providing habitat for nesting green turtles and breeding/ nesting habitat for seabirds, as well as nursery areas for fish that have open-water adult stages.

• supports large numbers of seabirds: 19 species of waterbirds, including seabirds and migratory birds have been recorded at the site. Thirteen species have been recorded breeding at the site. The cays within the site provide vegetation used for nesting sites.
(Phillips et al 2006)

Have studies or assessments been made of the economic valuation of ecosystem services provided by this Ramsar Site? Yes ○ No ○ Unknown ◉

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

<no data available>

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
National/Federal government	☑	☑

Provide further information on the land tenure / ownership regime (optional):

The Ramsar Site comprises two separate sections of the Coral Sea Marine Park, which is owned and managed by the Commonwealth Government of Australia. The Ramsar site and surrounding oceanic waters lie within the Coral Sea Islands Territory of Australia. Oceanic waters surrounding the Ramsar site are within the Australian Economic Exclusion Zone.

The site is used for nature conservation and scientific research as well as some recreational diving. There is no resident human population on the site although there is a manned weather station at Willis Island, outside of the Site, 50km north-west of the Magdelaine Cays.

5.1.2 - Management authority

Please list the local office / offices of any agency or organization responsible for managing the site:
Marine and Island Parks Branch, Parks Australia,
Department of Climate Change, Energy, the Environment and Water.

Provide the name and/or title of the person or people with responsibility for the wetland:
Coral Sea Marine Park Section

Postal address:
GPO Box 3090
Canberra ACT 2601
Australia

E-mail address: parksmedia@dcceew.gov.au

5.2 - Ecological character threats and responses (Management)

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

Transportation and service corridors

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Shipping lanes	Low impact	Medium impact	☐	No change	☑	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	☑	No change	☑	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	Medium impact	Medium impact	☑	No change	☐	No change

Natural system modifications

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Vegetation clearance/ land conversion	Medium impact	Medium impact	☑	No change	☐	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	High impact	High impact	☑	No change	☐	No change

Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Unspecified	Medium impact	Medium impact	☑	No change	☐	No change

Climate change and severe weather

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Droughts	Medium impact	Medium impact	☑	No change	☐	No change
Temperature extremes	Medium impact	High impact	☑	unknown	☑	unknown
Storms and flooding	Medium impact	Medium impact	☑	No change	☐	No change
Unspecified	High impact	High impact	☑	No change	☑	No change

Please describe any other threats (optional):

Threats:
• Infestations of soft scale insect (Pulvinaria urbicola): could damage/ destroy Pisonia forest, which would result in loss of critical seabird nesting habitat.

• Defoliation by hawkmoths (Hippotion velox): have the potential to damage/ destroy Pisonia forest. The potential long-term impacts of Hippotion velox on Pisonia forest is unknown.

• Beach erosion: the windward beach on North East Herald cay has been actively eroding since 1997, which could destabilse fringing Argusia shrubland vegetation.

• Crown of thorns starfish (Acathaster planci): have been observed within the site in low numbers. If numbers increase, this species has the potential to cause significant damage/ destruction of reef habitat.

• Illegal fishing/ specimen collection: is potentially an issue for the site, particularly in relation to bêche-de-mer. The reefs also have species considered attractive to the aquarium trade.

• Anchor damage: through indiscrete use of anchors by authorized or unauthorized vessels could damage reef habitat.

• Ballast water and pollutants: release of ballast water could introduce pests, pathogens or other pollutants into the ecosystem. Disposal of rubbish and/or disused nets could result in mortality of marine biota through ingestion and/or entanglement.

• Shipping accidents: modern shipping routes pass relatively close to the reefs and pose a risk of grounding and/or pollution from oil (or other) spills.

• Climate change: has the potential to impact the Site in various ways, including through:
- Increased incidences of coral bleaching
- Increased severity and frequency of storm events, including cyclones, which could reduce habitat availability (reef habitat, terrestrial habitat) for other species.

5.2.2 - Legal conservation status

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
National Marine Park	Coral Sea Marine Park	https://parksaustralia.gov.au/marine/parks/coral-sea/	partly

Non-statutory designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Important Bird Area	Coringa-Herald Reefs IBA	http://datazone.birdlife.org/site/factsheet/coringa-herald-reefs -iba-australia	partly

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

Other:

In Australia, the ecological character of a designated Ramsar site is protected as a matter of national environmental significance (MNES) under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

The areas of the Coral Sea Marine Park that form the Ramsar site (i.e., Coringa-Herald islets and cays, and Lihou Reef) are zoned as National Park Zone (IUCN II). The objective of the National Park Zone (II) is to provide for the protection and conservation of ecosystems, habitats and native species in as natural a state as possible.

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 ◉

URL of site-related webpage (if relevant): https://parksaustralia.gov.au/marine/pub/plans/coral-sea-management-plan-2018.pdf

5.2.6 - Planning for restoration

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

5.2.7 - Monitoring implemented or proposed

Monitoring	Status
Animal community	Implemented
Animal species (please specify)	Implemented
Birds	Implemented

Activities such as scientific research, dive charter tours and other commercial activities are managed by use of permits. Visitor logbooks monitor use of the site. Marine Parks staff (Australian Government Department of Climate Change, Energy, the Environment and Water) undertake visit the site at least once per year. Compliance patrols are undertaken by the Australian Border Force.

Resource limitations and the remoteness of this site mean research, monitoring and management responses are constrained and often opportunistic. Strategic review of management needs and resource allocation at the site ensures a mix of ongoing monitoring across several elements, combined with active management responses to the more urgent conservation issues.

Scientific studies have recommended ongoing monitoring, strict quarantine procedures for the islets and pre-testing of the impacts of biological control agents (BCA's) before decisions on implementing any BCA's and vegetation (e.g., Smith et al 2001; Freebairn 2007; Greenslade and Farrow 2008).

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

This RIS has been prepared using information from the Coral Sea Ramsar site Ecological Character Description; the Coral Sea Marine Park Management Plan; past Ramsar Information Sheets; and other key information sources. A full bibliography is included as an attachment under Section 6.1.2 vi, under the file name, "AU1222_lit230504__bibliography.docx".

6.1.2 - Additional reports and documents

i. taxonomic lists of plant and animal species occurring in the site (see section 4.3)
<1 file(s) uploaded>

ii. a detailed Ecological Character Description (ECD) (in a national format)
<1 file(s) uploaded>

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
<1 file(s) uploaded>

vi. other published literature
<1 file(s) uploaded>

6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:

Coral Reef, Coral Sea. Photo by Australian Customs Service (date of image unknown). (*Australian Government, 03-03-2005*)

Lihou Reef, Coral Sea. Photo by Australian Customs Service (date of image unknown). (*Australian Government, 29-01-2005*)

Coral Sea Ramsar site sign. Photo by Parks Australia (date of image unknown). (*Australian Government, 04-05-2023*)

6.1.4 - Designation letter and related data

Designation letter
<1 file(s) uploaded>

Date of Designation: 2002-10-21