Department of Environment and Science

Raine Island National Park (Scientific)

Incorporates: Raine Island, Moulter Cay and MacLennan Cay

Resource Information

2021

Queensland Government

This management statement has been jointly prepared by the Wuthathi People, Meriam Nation People and Queensland Parks & Wildlife Service and Partnerships (QPWS&P), Department of Environment and Science

Front cover photo: *Raines Islet on the Great Barrier Reef* by Edwin Augustus Porcher 1844 (Painting in the public domain)

This resource information document does not intend to affect, diminish or extinguish native title or associated rights.

Aboriginal and Torres Strait Islander people should be aware that this document may contain images or names of deceased persons in photographs and printed material that some people may find distressing.

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1. Introduction

The Department of Environment and Science recognises, respects and values First Nations peoples and cultures. We recognise First Nations rights and interests in the Country on which we walk, work and live. We are committed to progressing self-determination by working in genuine partnerships with First Nations peoples to incorporate their priorities and perspectives across our decision-making and operations. The *Gurra Gurra Framework 2020-2026* prioritises and accelerates this commitment, guiding the agency to embed Country and people at the centre of all that we do.

The Queensland Parks and Wildlife Service and Partnership's (QPWS&P) management planning process aligns with the Values-Based Management Framework (VBMF), an adaptive management cycle that incorporates planning, prioritising, doing, monitoring, evaluating and reporting into all areas of our business (Figure 1). It is based on international best practice and targets management focused on the most important features of each park: their key values.

Management plans and statements set the strategic management direction, guiding the next tier of planning and the development of thematic strategies, which in turn inform and prioritise our on-ground operations.

Queensland Parks and Wildlife Service (QPWS) is the operational stream of the QPWS&P division within DES. QPWS will be referred to throughout this document as the State's representative in the management partnership.

Resource information is a compendium of park information and a supporting document for management plans and management statements. It contains background information about a park's purpose, values, resources and legal and administrative framework.

Information about the Values-Based Management Framework is available on the DES website at www.des.qld.gov.au.

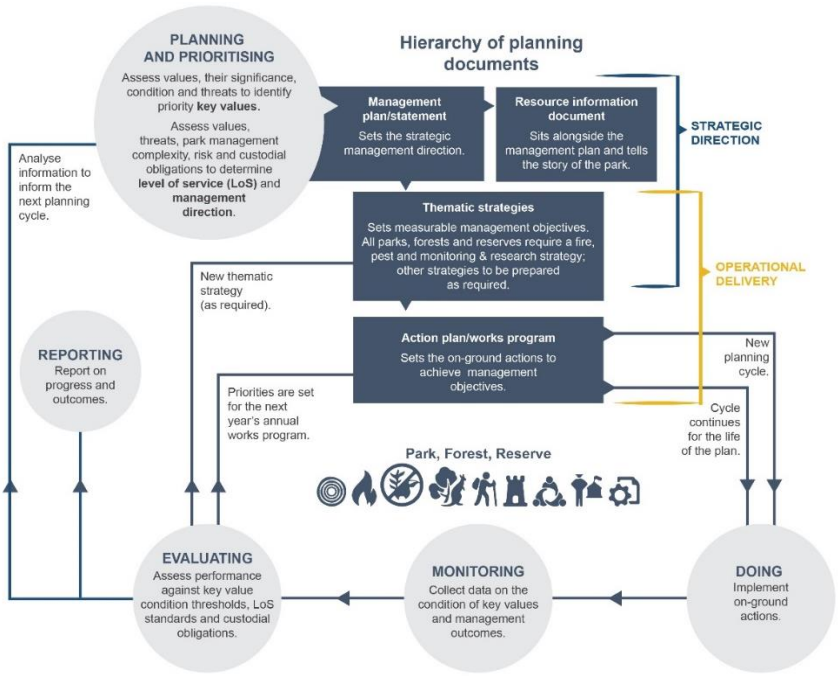
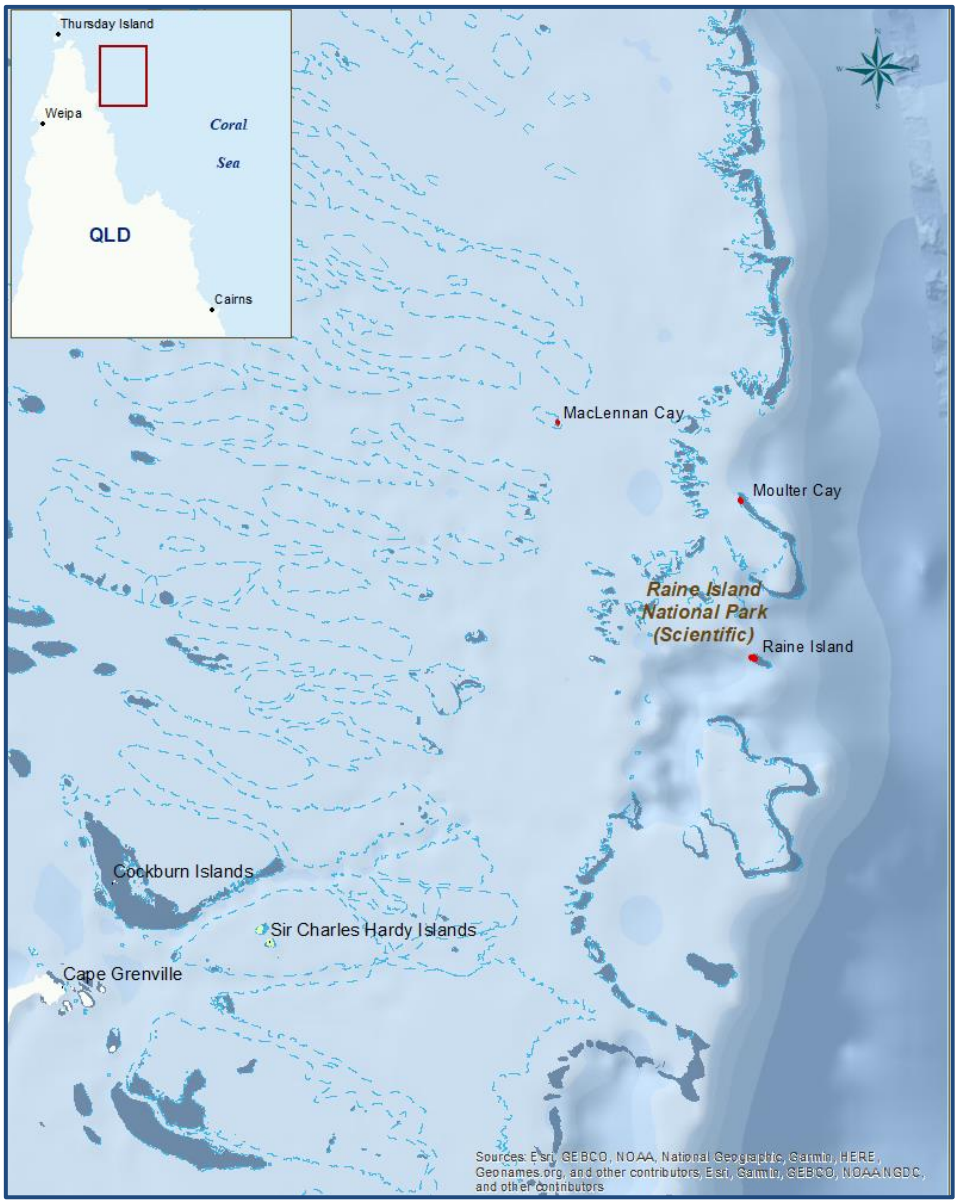


Figure 1. Phases of the VBMF cycle for planning and the hierarchy of planning documents

2. Raine Island National Park (Scientific)

Raine Island is an outer barrier cay located on the western (leeward) end of a 210 hectare planar detached reef, approximately 620 kilometres north-northwest of Cairns,170 kilometres south-east of the tip of Cape York Peninsula and 80 kilometres east north-east of Cape Grenville (Map 1). Nearby Moulter Cay and MacLennan Cay are smaller oceanic cays with related geomorphology. Of the two, only Moulter Cay is currently vegetated. Both the island and the two cays lack significant ecological influence from the mainland coast and share some attributes with oceanic cays located in the Coral Sea (Department of National Parks, Recreation, Sport and Racing 2013).



Map 1. Raine Island National Park (Scientific) location map

Raine Island National Park (Scientific), incorporating Raine Island, Moulter Cay and MacLennan Cay, was dedicated in August 2007 as a mechanism to upgrade the protection and management of the exceptional scientific, natural and cultural values of the island and cays. This remote island national park (scientific) is not accessible by the public, with restricted access provisions applying to the island and cays as well as the adjoining State and Commonwealth marine park waters. In 1997, the island and two cays were originally gazetted as a Nature Refuge, and managed under two conservation agreements between the State and the Raine Island Corporation to protect its significant natural and

cultural values. Funded by an international philanthropic entity, the Meaker Trust, the Corporation had a statutory responsibility to control public access, facilitate research activities, and manage the nature refuge in accordance with the management principles of a national park (scientific) [*Meaker Trust (Raine Island Research) Act 1981; Nature Conservation (Protected Areas) Amendment (No.2) No.85 1997*]. The Raine Island Corporation had statutory membership positions for both an Aboriginal and a Torres Strait Islander representative with connection to the area.

The *Raine Island National Park (Scientific) Indigenous Land Use Agreement (Area agreement)* (ILUA) between the Wuthathi People, Meriam Nation People and State of Queensland, was registered on 13 August 2007 and provided for the dedication of Raine Island National Park (Scientific) and the establishment of a consultative working group of Wuthathi People and Meriam Nation People, the Indigenous Land Use Agreement Working Group (ILUAWG). The ILUA includes both the park and surrounding marine park waters (extending three nautical miles from the high water mark of Raine Island, MacLennan Cay and Moulter Cay). The ILUA has been entered into as an Area Agreement under the *Native Title Act 1993* (Cwlth) with a focus on the parties working together cooperatively, to ensure that significant conservation and cultural values are protected. The ILUA is not associated with a formal determination of native title or recognition of native title by the State of Queensland.

Raine Island is a highly significant cultural and story place for Aboriginal and Torres Strait Islander peoples and part of a broader sea country cultural landscape belonging to the Wuthathi People and the Meriam Nation People. The island also features a stone beacon constructed in 1844 by the British Admiralty as a navigational aid and shelter for ships passing through the reef's northern passage. Visible for some 13 nautical miles, it is a landmark of national cultural significance. Raine Island also preserves other historical features, including sites of archaeological sensitivity that are representative of its early maritime, guano mining and beche-de-mer history.

Raine Island National Park (Scientific) is within the Great Barrier Reef World Heritage Area (GBRWHA). The surrounding waters are managed under the Great Barrier Reef Marine Park (Commonwealth) and the Great Barrier Reef Coast Marine Park (Queensland). Access to the park is restricted to scientific and conservation purposes only. No public access is permitted within Raine Island National Park (Scientific). The State and Commonwealth marine parks immediately surrounding Raine Island and MacLennan and Moulter Cays have been declared a Restricted Access Special Management Area under both State and Commonwealth legislation, and access to these waters is by permit only. This restriction further protects breeding seabirds and turtles. The park is within a Marine National Park (Green) Zone where all fishing, harvesting and other marine extractive activities (other than permitted research and traditional native title holder activities) are prohibited.

Raine Island is the site of the world's largest known rookery for the internationally endangered[1] green turtle *Chelonia mydas*, which comes ashore in the tens of thousands to nest each year. Raine Island is also the most diverse seabird rookery in the GBRWHA.

Bioregion	East Cape York Bioregion		
Area	40ha		
Local Government Area	Cook Shire Council	**State electorate**	Cook
Management obligations	*Nature Conservation Act 1992* (Qld) (NCA) *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC) Great Barrier Reef Intergovernmental Agreement 2009 Q12006/044 – *Raine Island National Park (Scientific) Indigenous Land Use Agreement*		

[1] *Chelonia mydas* is listed as 'endangered' at an international level [International Union for Conservation of Nature (IUCN)]; listed as 'vulnerable' at both a national Australia level [Environment Protection and Biodiversity Conservation Act 1999 (EPBC)] and the Queensland level [Nature Conservation Act 1992 (NCA)].

2.1 Wuthathi People and Meriam[2] Nation People

Wuthathi People of eastern Cape York Peninsula identify as the Traditional Owners/Custodians and holders of Native Title in the [Raine Island ILUA] Agreement Area, including holding custodial rights to speak for, govern and manage Native Title in the Agreement Area. Wuthathi connections to Raine Island go back 60,000 years when sea levels were much lower and Raine Island was only five kilometres from the ancient coastline.

Erubam Le, Meriam Le and Ugarem Le from the eastern islands of Torres Strait, which together make up the Meriam Nation, identify as holders of Native Title in the Agreement Area. Meriam Nation People are connected to Raine Island through their canoe voyages and trading with Wuthathi People over several thousand years.

Wuthathi People and Meriam Nation People also have a shared history of involvement in commercial fishing around Raine Island since the 1860s.

[Source: Raine Island National Park (Scientific) Indigenous Land Use Agreement Working Group (2018a)]

The Wuthathi People refer to Raine Island as *Thukuru* and the Meriam Nation People refer to the island as *Bub Warwar Kaur*.

For further information on Wuthathi People and their connection to land and sea country (including Raine Island National Park (Scientific)), refer to the Wuthathi Aboriginal Corporation website http://www.wuthathi.com.au/

A common language and strong kinship ties unite the Meriam Nation People. They continue as skilled hunter–fisher–gatherers in family groups or clans living on a number of inner eastern Torres Strait Islands, including *Mer* or Murray Island. The Meriam Nation People are well known for their involvement in the High Court of Australia's Mabo decision that fundamentally changed land law in Australia by recognising native title. Further general information on Meriam Nation People can be found at: http://www.mabonativetitle.com/mer_08.shtml

The 2007 Raine Island ILUA provided for the dedication of the park as national park (scientific) and the establishment of a consultative Working Group of Wuthathi People and Meriam Nation People. The ILUA includes both the park and surrounding marine park waters (extending three nautical miles from the high water mark of Raine Island, MacLennan Cay and Moulter Cay). The Working Group meets at least annually with the State of Queensland. Its role is to negotiate management protocols and other arrangements to give effect to the ILUA and the management statement (as amended from time to time). Under the Working Group framework, the ILUA provides for collaboration between the parties on a wide range of Raine Island National Park (Scientific) management issues, including (but not limited to) preserving indigenous cultural heritage and any other matters that may affect the rights and interests of the Native Title Groups.

In 2018, with the support of QPWS, the Wuthathi People and Meriam Nation People, through the Indigenous Land Use Agreement Working Group (ILUAWG), prepared their own planning document:

[2] The name ‘Meriam’, and hence the term ‘Meriam Nation People’, both refer collectively to those First Nations People from Erub, Mer, Ugar and Dauar Islands in the eastern Torres Strait [Raine Island National Park (Scientific) Indigenous Land Use Agreement Working Group personal communication November 2020].

Caring for Raine Island Country and Culture. A strategic plan for the Indigenous cultural heritage management of the Raine Island Group (the plan) (ILUAWG 2018). The plan provides an invaluable primary source document to understanding the cultural values of the First Nations Peoples, and their social, cultural, economic, governance and management aspirations for Raine Island National Park (Scientific) and surrounding marine park waters. The plan has been a key element in developing the management statement, particularly in identifying key values (including condition and trend), threats and strategic management directions.

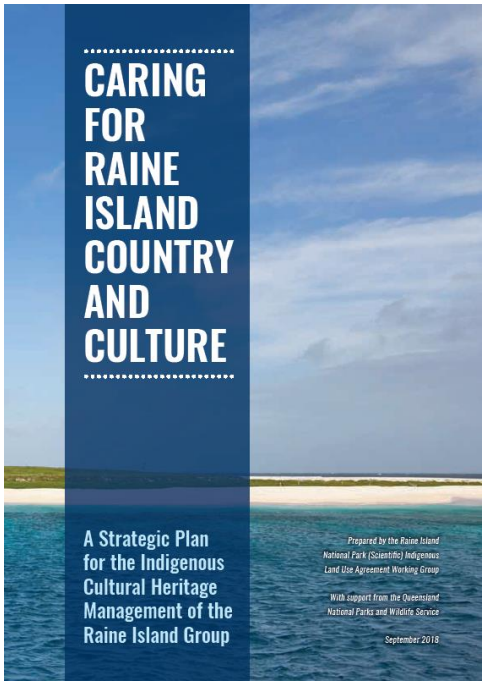
2.2 Indigenous-led strategic planning

Caring for Raine Island Country and Culture. A strategic plan for the Indigenous cultural heritage management of the Raine Island Group

In the *Caring For Raine Island Country and Culture. A strategic plan for the Indigenous cultural heritage management of the Raine Island Group* (the plan), the ILUAWG has developed a framework for the Wuthathi People, Meriam Nation People, QPWS, researchers and other partners to work together to care for the area's cultural, environmental and economic values.

The plan supports the Wuthathi People and Meriam Nation People to actively be involved in managing their cultural heritage through Indigenous-led governance, capacity-building, and partnerships. Through the plan, the ILUAWG:

- tells the story of Raine Island and broader Sea Country
- identifies important values, rights and interests of People and Country, and their known threats
- communicates Traditional Owners' vision, aspirations and commitments to sustainable use and management
- establishes priority actions to mitigate threats to Country and achieve their vision, aspirations and commitments in collaboration with partners and stakeholders.



The plan provides significant insight into the values and management aspirations of the ILUAWG on behalf of the First Nations peoples. The plan is a key resource underpinning the development and implementation of the Raine Island National Park (Scientific) Management Statement. In addition to enhanced natural and cultural values protection, the plan also focuses on securing social, educational and economic benefits for the Wuthathi People and Meriam Nation People, including sustainable Indigenous-led commercial tourism, and employment and cultural and scientific learning opportunities for their young people.

2.3 World Heritage

Raine Island National Park (Scientific) sits within the GBRWHA.

The Great Barrier Reef was declared a World Heritage Area in 1981 because of its 'outstanding universal value'. This recognised the reef as being one of the most remarkable places on Earth, as well as its global importance and its natural worth.

The World Heritage Committee listed the reef for all four natural criteria (Commonwealth of Australia 2019). The values of Raine Island National Park (Scientific) are consistent with the following three of the recognised four GBRWHA natural criteria, most notably in relation to the extent, nature and significance of its green turtle *Chelonia mydas* rookery and seabird nesting habitat:

- **Criteria 7:** Contains superlative natural phenomena or area of exceptional natural beauty and aesthetic importance.
- **Criteria 9:** Outstanding examples representing significant ongoing ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals.
- **Criteria 10:** Contains the most important and significant habitats for in-situ conservation of biological diversity, including those containing threatened species of Outstanding Universal Value from the point of view of science or conservation.

2.4 Ecosystems and biodiversity

Raine Island National Park (Scientific) is a vertebrate biodiversity hotspot within the GBRWHA. Raine Island, the largest and most ecologically significant landform, has become highly modified through a history of guano mining and related maritime use, including the previous presence of goats *Capra aegagrus hircus* and construction of the historic beacon. Despite these historic impacts and harsh environmental conditions, Raine Island is renowned as the most diverse and one of the most important tropical seabird rookeries in the GBRWHA, and for supporting the world's largest remaining green turtle *Chelonia mydas* nesting population (Department of Environment and Science 2019a). Vegetation is largely sparse (a low mat of grasses, herbs and shrubs), and currently only occurs on Raine Island and Moulter Cay. While the vegetation is not particularly noteworthy in itself from a conservation significance perspective, it plays an important role in island and cay landform stability, and provides important nesting and rookery habitat, particularly for the diverse seabird populations (Figure 3).

More than eighty bird species have been recorded at Raine Island since the first documented visit in 1842, many of these being vagrant species from the mainland. The endangered[3] Herald petrel *Pterodroma heraldica* is currently unknown from any other island in the GBRWHA apart from Raine Island. Sixteen different bird species are known to have bred on Raine Island, including fourteen seabirds and the nankeen night-heron *Nycticorax caledonicus* and the buff-banded rail *Gallirallus philippensis*.

Raine Island, Moulter and MacLennan Cays, and surrounding waters, provide refuge for the vulnerable (NCA and EPBC) green turtle *Chelonia mydas*. They nest primarily at Raine Island and Moulter Cay (with incidental nesting at MacLennan Cay), with tens of thousands of adult female green turtles coming ashore each year to nest on Raine Island. The numbers of turtles nesting varies from year to year as well as throughout the year, with the highest density nesting occurring during the mid-summer months. They are a genetically distinct population of an ancient lineage that has long been isolated from green turtle populations in other parts of the world. This includes being distinct from the southern Great Barrier

[3] NCA – endangered; EPBC – critically endangered; IUCN – least concern

Reef breeding stock (Department of Environment and Science 2019a). The Raine Island National Park (Scientific) population is one of the largest remaining stocks of green turtles in the world.

Coral reef islands and cays, such as those found within Raine Island National Park (Scientific), are one of the habitats most vulnerable to the effects of climate change. This is because they are low-lying and growth and maintenance of cays depends on sediment accumulation. Key stressors include sea-level rise and coastal erosion (Dawson *et al*. 2014; Great Barrier Reef Marine Park Authority 2019a). Further, the sediments necessary for cay renewal and growth are derived from reef organisms, such as benthic [4] foraminifera, which are themselves particularly susceptible to ocean acidification.

2.4.1 Regional ecosystems

Regional Ecosystem mapping is not available for Raine Island National Park (Scientific). Vegetation, including individual plant species found within the national park (Scientific), is discussed in Section 2.5.2.

Figure 2. Wet season at Raine Island © Gary Cranitch 2017, Queensland Museum

[4] Foraminifera, also commonly referred to as 'forams,' are minute marine organisms with a calcareous shell that contribute significantly to sand formation and cay maintenance along the Great Barrier Reef.

2.5 Species

2.5.1 Native animals

Located in association with a continental shelf slope in a major reef passage, Raine Island National Park (Scientific) is thought to be in an area of shelf-edge nutrient up-welling. While this remains speculative, the seasonal presence of dense populations of turtles and seabirds on the island implies that important links exist between oceanographic conditions, food webs and nesting behaviour. Large feeding aggregations of sharks during turtle activity also highlight the area's ecological connections (Department of National Parks, Recreation, Sport and Racing 2013).

Further to its status as a highly significant seabird rookery, Raine Island is the only known nesting site in Australian waters for the endangered[4] Herald petrel, *Pterodroma heraldica*. In 2017, 26 birds were seen at Raine Island and one pair was observed breeding (the first confirmed breeding sighting since 1987) (Great Barrier Reef Marine Park Authority 2019a). Several other nests have been located in subsequent breeding seasons since this survey. The vulnerable[5] red-tailed tropicbird, *Phaethon rubricauda,* also nests in small numbers, but Raine Island is the most significant site for tropicbirds in the GBRWHA.

Seabird surveys are undertaken at Raine Island at least three times a year to monitor breeding numbers, in accordance with the *Coastal Bird Monitoring and Information Strategy: Seabirds 2015-2020* (Department of Environment and Science 2019b). While there has been a significant increase in field management activity on Raine Island since 2014 (particularly in relation to turtle management interventions), current monitoring indicates no overly concerning impact on the island's seabird population (Australian Government and Queensland Government 2019).

Declining global sea turtle populations emphasise the international importance of the Raine Island National Park (Scientific) turtle rookery. Unfortunately, the green turtle *Chelonia mydas* rookery continues to face real threats. For example, one of the largest nesting events, recorded in December 1996, is thought to have been compromised by the elevation of Raine Island's water table due to exceptionally high tides (Limpus *et al* 2003). Such events underline the need to continue turtle population monitoring studies, to adopt a strategic approach to assessing current and future risks, and to identify management actions that can be taken to maintain or enhance green turtle reproductive success. Key strategies supporting ongoing monitoring and direct management intervention for both the green turtle and seabirds of Raine Island National Park (Scientific) include the *Raine Island Recovery Project* (Department of Environment and Science 2019a) and the *Reef 2050 Long-term Sustainability Plan* (Commonwealth of Australia 2018).

The Great Barrier Reef Marine Park Authority's (GBRMPA) *Great Barrier Reef Outlook Report 2019* provides a valuable assessment of contemporary studies of Raine Island's green turtles, which make up 90 per cent of the northern Great Barrier Reef green turtle breeding population. While concerns have been expressed about declines in nesting and hatchling success of green turtles at Raine Island, Moulter Cay and MacLennan Cay since the mid-1990s, extra management interventions (such as beach re-profiling and cliff-top fencing) implemented on some parts of Raine Island since 2014 are slightly improving reproductive success and reducing adult mortality. Nevertheless, the previous period of low hatchling productivity is expected to cause a future decline in nesting turtle numbers on Raine Island National Park (Scientific) because there will be fewer adult turtles entering the breeding population. Given that an estimated 90 per cent of the northern Great Barrier Reef nesting population nest on Raine Island or nearby Moulter Cay, there may be significant implications for the northern population as a whole. Warming temperatures are resulting in the feminisation of the green turtles originating from nesting beaches in the northern Region, potentially leading to significant scarcity or absence of adult males in the future (Great Barrier Reef Marine Park Authority 2019a).

[4] NCA – endangered; EPBC – critically endangered
[5] NCA – vulnerable

There have been no sightings of other turtle species nesting on Raine Island National Park (Scientific) since turtle research commenced in 1974; Limpus et al. 2003 reported the occurrence in 1974 of skeletal remains of an adult hawksbill turtle in the central depression where nesting turtles are often trapped and die.

While records are often incomplete or un-compiled, arachnids, insects (later identified to also include native ants) and crustaceans have been collected from Raine Island National Park (Scientific) (Queensland Parks and Wildlife Service 2006).

Unauthorised access is difficult to manage and poses a threat to the park's native animals either through disturbance, direct take or biosecurity incursions. The area's remoteness has contributed to inappropriate historical activity such as the harvesting of clams (1984) and incursions by foreign fishing vessels (2006). Illegal harvesting of marine resources may remain a low yet potential threat to park values (Department of National Parks, Recreation, Sport and Racing 2013).

2.5.2 Native plants

The vegetation community on Raine Island has been severely disturbed by historical events such as the planting of vegetables and non-endemic plants (1800s), introduction of goats *Capra aegagrus hircus* (1840s), guano (phosphate) mining (1890s). Despite these historical impacts, plant species assemblages appear to have been relatively stable on Raine Island and Moulter Cay since the early 1970s. MacLennan Cay is currently un-vegetated although vegetation has been recorded in the past (Department of National Parks, Recreation, Sport and Racing 2013).

On Raine Island, vegetation consists of a low mat of grasses, herbs and sparsely occurring shrubs on the interior of the island, with 13 species recorded since 1973. Vegetation occurs within the swale area (between the phosphate cliff line/island interior and high tide mark) outside of the peak turtle-breeding season. Another species, the herb *Lepidium englerianum,* has not been recorded since the 1973 survey. Raine Island vegetation is thought to be derived from drift seeds probably from Coral Sea islands, Cape York Peninsula and the Papua New Guinea coast, and there is potential for seed dispersal through seabirds. These processes may influence vegetation change over time. Stalky grass *Lepturus repens* may play an important role in island stability, erosion control, and seabird nest habitat. The breeding success of some bird species may depend on the continuing viability of specific vegetation types (Department of National Parks, Recreation, Sport and Racing 2013).

The various zones at Raine Island provide specialised habitat requirements such as earth mounds and cliff cavities for nesting seabirds such as wedge-tailed shearwaters *Ardenna pacificus* and red-tailed tropicbirds *Phaethon rubricauda*. The location and success of summer seabird breeding is affected to a varying extent by the vegetation disturbance that results from turtle nesting.

On Moulter Cay seven plant species have been recorded: two grasses; stalky grass *Lepterus repens*, coast button grass *Dactyloctenium aegyptium*, three herbs; bulls head vine *Tribulus cistoides*, chaff flower *Achyranthes aspera*, pigweed *Portulaca oleracea* and two shrubs tar vine *Boerhavia diffusa*, yellow pea bush *Sesbania cannabina*. The island's grasses and herbs can be severely disrupted by storm events, extended dry seasons and during summer turtle nesting seasons. However, revegetation normally occurs after significant rainfall.

During the 1980s the central vegetated zone on MacLennan Cay contained three plant species: a tussock grass *Lepterus repens*, herb *Portulaca oleracea*, and low shrub tar vine *Boerhavia diffusa*. The island's narrow shape and exposure to weather and storm surge may have contributed to a reduction in size and height of the cay and the complete loss of vegetation observed in February 2010 (Department of National Parks, Recreation, Sport and Racing 2013).

2.6 Geophysical features

The oceanic island and cays that constitute Raine Island National Park (Scientific) are believed to have been formed during the last 4700 years following the last post-glacial sea level rise. Raine Island is a significant vegetated cay approximately 830 metres long and 430 metres wide. It consists of four clearly defined concentric zones: the beach, phosphate rock cliff (derived from bird excrement), vegetated ridge, and a central depression (a remnant of guano mining). Vegetation consists of a low mat of grasses, herbs and shrubs, comprising 13 species (Queensland Parks and Wildlife Service 2006). The various zones at Raine Island provide specialised habitat requirements such as earth mounds and cliff cavities for nesting seabirds.

Moulter Cay is composed of a wide coral sand beach adjoining a vegetated depression with a low (<1m high), discontinuous cliff of loosely cemented coralline rock surrounding a raised central vegetated platform up to three metres above high water mark. Phosphate rock cliffs on Raine Island and Moulter Cay provide a natural barrier that partly prevents turtles accessing the central vegetated seabird breeding areas.

MacLennan Cay consists of a small (< 50m diameter) coral sand and shingle mound with beach rock on the eastern side. Records from the 1970s and early 1980s confirm that at that time MacLennan Cay was significantly larger and of sufficient height to maintain a moderate level of seabird breeding and a central, sparsely vegetated zone comprising low herbs and grasses (Department of National Parks, Recreation, Sport and Racing 2013). Surveys in 2010 and 2017 confirm that MacLennan Cay is currently un-vegetated. In its present configuration, the cay only supports moderate incidental seabird nesting.

Figure 3. Raine Island © Biopixel

2.7 Recreational opportunities

There are no recreational opportunities available at Raine Island National Park (Scientific). This is due to the restricted access special management area declared over the national park and surrounding marine park waters precluding recreational activities and protecting the integrity of the seabird habitat and green turtle rookery from visitor impacts.

2.8 Ecotourism

At present tourism is not permitted at Raine Island National Park (Scientific) under the restricted access management provisions that apply separately over the National Park (Scientific) and the surrounding Marine Park waters. Discussions continue with Wuthathi People and Meriam Nation People, under the framework of the Raine Island ILUA, regarding the possibility for small-scale Indigenous-led tourism permissions in the future.

2.9 Historic cultural heritage

The first recorded European discovery of Raine Island was in 1815 by Thomas Raine, acting captain of the convict transport *Surrey* on a return trip to England via China (Australian Government 2019). However, the maritime history of the island actually extends back thousands of years as demonstrated by the cultural stories and history of the seafaring Wuthathi People and the Meriam Nation People (ILUAWG 2018). The historical features remaining on Raine Island (particularly the Raine Island Beacon, the gravesite and mining archaeology) are of shared cultural significance to both First Nations People and the wider community. Refer to Appendix 4a.

2.9.1 Maritime history and the Raine Island Beacon

Raine Island is located in a remote area of the Great Barrier Reef that was the site of numerous shipwrecks, particularly during the 1800s. Prior to the construction of the beacon, ships bound north from Australia to Asia generally took the Outer Passage before turning west through the Great Barrier Reef to Torres Strait. Passing ships used Raine Island during this period as a place to collect turtle, birds' eggs and birds to replenish ship stores. The area's reefs claimed many ships, including the *Pandora*, wrecked in 1791 and one of Australia's most important historic shipwrecks. It lies in Pandora Entrance just to the north of Raine Island. In 1842, the *Martha Ridgeway* was wrecked 40 kilometres south of the island. This shipwreck site has recently been relocated (Great Barrier Reef Marine Park Authority 2019b). The beacon to aid navigation was built on Raine Island in 1844 by the British Admiralty using convict stonemasons. It also served as a shelter for shipwrecked sailors. Though serving as a landmark for shipping and used by crews, the beacon soon became obsolete on discovery and use of the northern passage. The beacon was built mostly of local materials: coral limestone quarried on site, shells burned to make lime for mortar, and timber from the *Martha Ridgway* (Australian Government 2019; Queensland Government 2019).

Located on the eastern end of the island, the Raine Island Beacon is a substantial structure about 12 metres high with a base diameter of 9 metres. Although never lit, the beacon remains visible out at sea for 13 nautical miles. Constructed of good quality coral limestone trimmed to produce a continuous curve inside and out, its cylindrical form decreases in diameter in four steps upwards and is topped by a crenellated parapet. A lightning conductor of wrought copper is fitted from top to bottom of the east face. The only opening in the walls is a semi-circular arched doorway surmounted by the inscription 'VR' (from the Latin – *Victoria Regina*) and the date: 1844. Two inscribed stone plaques inserted into the wall above the keystone are illegible due to erosion. The interior originally comprised three levels of wooden floors, which were reached by ladders and topped by a dome of timber ribs covered with canvas.

More than 900 legible inscriptions have been carved or painted inside the beacon. Many of these names belong to Wuthathi People and Meriam Nation People. Their descendents today recognise the beacon as being of significant shared historical value: 'the beacon shows common interest in navigation between our cultures and has family names of our people who have passed away'.(ILUAWG 2018; p.45). The presence of First Nations Peoples' inscriptions carved on the Raine Island beacon highlights the mobility and occupational habits of these groups, both in co-operation with European ventures and Torres Strait Islander-owned and crewed vessels. They used the islands, reefs, and waters of the outer barrier extensively from the 1840s in response to the growing commercial exploitation of turtles, pearls and trochus shell, and later also beche-de-mer. (Department of National Parks, Recreation, Sport and Racing 2013).

The beacon also records the names of those from ships who sheltered on the island, and others such as Chinese miners, whose names would not otherwise have made their way into official historical documents. Place names are also inscribed into the internal wall of the beacon, including Tonga, Port Samuel, Weipa and Murray Island.

Goats *Capra hircus* were introduced to provide a food source for shipwrecked sailors and for those temporary island residents involved in beacon construction, guano mining and possibly the beche-de-mer industry. No remnant goats or other domestic animals are on the island today.

Shoreline recession at Raine Island during the 1980s raised concerns about the long-term stability of the beacon. In 1987, a grant under the Australian Bicentennial Project in partnership with the Raine Island Corporation/Meaker Trust enabled Scottish stonemason, Ian Watson, and crew to complete tower restoration and foundation repairs. This work included replacement block fabrication, sealing of the parapet top, and construction of an aluminium access ladder and viewing platform to enable future research observations. A related expedition in 1994 completed exterior pointing of stonework and installed lightning conductors. An archaeological investigation in 1995 by Austral Archaeology developed guidelines for long-term management including developing a Raine Island Cultural Sites Conservation Policy (Department of National Parks, Recreation, Sport and Racing 2013). Additional site inspections in 2015 and 2018 identified that further conservation works are required, including stabilisation of the underlying rock platform, repair of extensive lightning-induced cracks in the masonry, internal masonry repointing, and repair to the lightning conductor (Swann, J. 2018).

Appendix 4b summarises the listing of the Raine Island Beacon on the Queensland Heritage Register and the Australian Heritage Database.

2.9.2 Guano mining and beche-de-mer fishery history

Thousands of years of seabird occupation of Raine Island resulted in significant deposits of guano on the island. While attracting commercial interest as early as 1865, guano (phosphate) mining of historical significance was carried out on Raine Island between 1890 and 1892 by the J.T. Arundel Company. This company established a large operation that included constructing tram tracks, huts, a desalination plant, a stone-lined well and a loading jetty, remnants of which remain as archaeological deposits. The company employed one hundred Chinese and Malay labourers and ten European supervisors, leaving evidence of their occupation behind. This, today, is valued for the archaeological story the remnants tell. Tens of thousands of tonnes of phosphate were dug and exported during this short period. The grave near the tower belongs to Annie Eliza Ellis, the mine manager's mother who died on 29 June 1891, aged 52 years. Her last words were recorded on her [6]gravestone: "*Father! Not my will but thine be done. My-God-of-Love. Reader! Be Ye Also Ready"*, a potent reminder of the hardships endured by the island's inhabitants (Department of Environment and Science 2019b).

During the 1870s beche-de-mer was collected from the island. Little evidence survives of this industry, but it may be possible that four burials from this era of the island's history survive (Austral Archaeology, 1995).

A slump in demand for phosphate was triggered by a drought on the mainland. Commercial activity does not appear to have taken place on the island after 1892. However, the beacon tower continued to be used unofficially for conveying messages, as evidenced by hundreds of inscriptions on the inner walls (Queensland Government 2019).

[6] The current gravestone associated with this gravesite is actually a replica commissioned by the Raine Island Corporation, with the original being kept at the Queensland Museum.

2.10 Partnerships

The 2007 Raine Island ILUA provided for the dedication of the park as National Park (Scientific) and the establishment of a consultative Working Group of Wuthathi People and Meriam Nation People. The ILUA includes both the park and surrounding State marine park waters (extending three nautical miles from the high water mark of Raine Island, MacLennan Cay and Moulter Cay).

Following dissolution of the Raine Island Corporation in 2005, QPWS and GBRMPA became the principal management agencies. The Reef Joint Field Management Program, a partnership between QPWS and GBRMPA, has statutory responsibility for delivering day-to-day management outcomes for the GBRWHA, including Raine Island National Park (Scientific) and the surrounding State and Commonwealth marine parks.

Other partnerships between First Nations People, the Reef Joint Field Management Program, other State and Commonwealth departments, research institutions and non-government conservation organisations also play an important role in improving the health and resilience of natural and cultural values.

Wuthathi People and Meriam Nation People have clearly identified the need for culturally appropriate partnerships with government and non-government organisations, research institutions, philanthropic and private sector entities, to help deliver the priority actions in *Caring For Raine Island Country and Culture. A strategic plan for the Indigenous cultural heritage management of the Raine Island Group* (ILUAWG 2018).

Given the ecological and cultural sensitivity, and the fact that the area is not accessible to the wider community, it is important that strong partnerships continue to be developed with reliable filmmakers and print and digital media outlets to appropriately market the values and conservation work being undertaken.

2.10.1 Raine Island Recovery Project

Commencing in the 2014-2015 financial year, the Raine Island Recovery Project is a five-year, $7.95 million collaboration between BHP[6], the Queensland Government, GBRMPA, Wuthathi People and Meriam Nation People and the Great Barrier Reef Foundation. The Raine Island Recovery Project aims to protect and restore the island's critical habitat to ensure the future of key marine species, including green turtles and seabirds. In specific terms, the Project aims to (Department of Environment and Science 2019a):

- restore the island turtle nesting habitat through beach re-profiling
- install cliff-top fencing to reduce mortality of nesting female turtles
- rescue stranded and overturned nesting female turtles
- monitor key island species—including turtles, seabirds and apex predators
- undertake research that is focused on increasing the resilience and viability of key species such as turtles and seabirds
- build Indigenous ranger capacity.

[6] BHP, formerly known as BHP Billiton, is the trading entity of BHP Group Limited.

2.11 Scientific research

The first scientific expedition to Raine Island was not undertaken until 1843 when members of the surveying voyage of HMS Fly and HMS Bramble, under the command of Captain Blackwood, landed at the island (Australian Government 2019).

Raine Island has long been recognised as an important location for reef-related research primarily concerning geomorphology, botany, seabird and sea turtle population dynamics (Department of National Parks, Recreation, Sport and Racing 2013). Early last century, Raine Island was the subject of sporadic research mostly related to seabirds. The ornithologist, W. MacGillivray, made numerous observations when visiting the island in 1910 and 1913. More contemporary research since the 1970s has concentrated on the island's geomorphology and turtle and seabird populations including continual QPWS research and monitoring. As a result, Raine Island and Moulter Cay are now the focus of an extensive body of scientific knowledge including the age and development of the present-day reef and island, and globally significant green turtle *Chelonia mydas* nesting studies. A 2008 James Cook University investigation provides a review of the scientific status of Raine Island and the future implications of climate change (Hopely 2008). This report (along with some earlier studies) highlights the interconnectedness between the physical attributes of the island and reef and the sustainability of ecological processes and species. As an example, Raine Island supports a unique breeding and feeding association between the nankeen night-heron *Nycticorax caledonicus* and the green turtle where turtle hatchlings become prey to the night-herons.

The interrelationships between the physical processes and the ecology of the area require further research to ensure that management arrangements will also protect endangered species such as the Herald petrel *Pterodroma heraldica*. Some comparative research programs continue to address critical matters such as the sustainability of the turtle rookery and seabird populations. The *Raine Island Climate Change Adaptation Plan 2010–2070* was developed by the Queensland Government to guide management actions in relation to climate change at Raine Island for the Northern Great Barrier Reef green turtle population and nesting seabird species. *The Great Barrier Reef Climate Change Adaptation Strategy and Action Plan (2012–2017)* was subsequently developed by the Great Barrier Reef Marine Park Authority, with a particular focus on Raine Island as an adaptive management case study (Great Barrier Reef Marine Park Authority 2012).

From 2014, the research focus has been on supporting development and implementation of the Raine Island Recovery Project. The aim of the Project was to protect and restore the island's critical habitat to ensure the future of key marine species, including the green turtle and seabirds. It is the first project to help the recovery of green turtle populations on Raine Island by addressing the issues of low nesting and hatching success and high adult turtle mortality. Formal governance arrangements including a Scientific Advisory Group and a broader based Reference Group (which includes representation from First Nations Peoples, James Cook University, State and Commonwealth government departments and the Torres Strait Regional Authority) provide advice and support to the research and management direction of the Raine Island Recovery Project. Research priorities have been broad and multi-disciplinary including applying new technologies, understanding turtle nesting and hatching success (including nest micro-environment factors), island hydrodynamics and geomorphology, island beach re-profiling, turtle population dynamics, and seabird ecology. Sharing the key project learnings with the science and management communities is an important part of the Project. Additional information about the Raine Island Recovery Project can be found by searching at www.des.qld.gov.au (Department of Environment and Science 2019a).

Significant archaeological investigations were undertaken at Raine Island in 1983, 1987 and 1995. The first expedition excavated trenches inside the tower and catalogued hundreds of small archaeological finds. Ashes recovered indicate that early beche-de-mer operations may have burned the tower's original timbers (Department of National Parks, Recreation, Sport and Racing 2013). The archaeological collection uncovered by these investigations is stored at Townsville's Maritime Museum.

The *Caring For Raine Island Country and Culture. A strategic plan for the Indigenous cultural heritage management of the Raine Island Group* identifies additional research and information requirements to address management needs from a First Nations Peoples' perspective (ILUAWG 2018). Wuthathi People and Meriam Nation People seek partnership support for the following identified priority research and information actions:

- develop Wuthathi People and Meriam Nation People Information Management Systems
- apply 'both ways' knowledge to research and management
- develop and implement Wuthathi People and Meriam Nation People research strategies
- develop and implement a communication strategy.

Conditions on scientific research permits require that an authorised departmental officer accompany research and other related activities. Wuthathi People and Meriam Nation People have expressed a desire to be more directly involved in permit assessment in relation to natural, cultural and historical values.

2.12 Education

Widespread media reporting of damage to coral reefs including global coral bleaching events and crown-of-thorns starfish *Acanthaster planci* outbreaks has heightened community awareness of the vulnerability of coral reefs, particularly to climate change. The global importance of Raine Island for sea turtles and seabirds and its protected management regime, combine to make it an important site within the Great Barrier Reef for advancing research and associated environmental education.

As public access to the Raine Island National Park (Scientific) is restricted, educational information is necessarily delivered off park. Educational materials including the management statement and further information on the Raine Island Recovery Project are available through the DES website. The Recovery Project team also delivers face-to-face school talks (including across Far North Queensland and Torres Strait island schools) as well as presenting research and information at turtle and coral reef symposia. A broad range of research and management publications featuring Raine Island is also available through GBRMPA, non-government conservation organisations such as the Great Barrier Reef Foundation, research institutions and the internet.

Further educational information on First Nations People's cultural values for the national park (scientific) can be found in *Caring for Raine Island Country and Culture. A strategic plan for the Indigenous cultural heritage management of the Raine Island Group* (ILUAWG 2018). This document also identifies the importance to Wuthathi People and Meriam Nation People of their children being able to actually visit Raine Island (as well as to access appropriately recorded traditional stories and information) in order to further learn and strengthen their spiritual/cultural connection to the area.

2.13 Fire

Fire on Raine Island and Moulter Cay has the potential to severely impact island ecosystem function and to severely disrupt seabird breeding and degrade nesting habitat. Historical records suggest that the fire-sensitive vegetation communities of Raine Island and Moulter Cay (and previously MacLennan Cay) are neither fire-dependent nor fire-affected (Department of National Parks, Recreation, Sport and Racing 2013).

The Queensland Government's *Planned Burn Guidelines: Cape York Peninsula Bioregion of Queensland* identifies that 'all dune and coral cay communities are fire-sensitive and do not require fire' (p. 81). Wuthathi People and the Meriam Nation People traditionally do not burn the cay vegetation. However, they have identified an ongoing need for small ceremonial fires on the beach to meet 'welcome to country' and related cultural obligations.

2.14 Pests

At this point (and despite the historic activity of the past), there is only a very limited pest presence on Raine Island National Park (Scientific), with no specific evidence of any impacts of particular concern. However, rigorous ongoing biosecurity measures (particularly quarantine and surveillance) will reduce the risk of new or expanded pest plant or pest animal incursions, particularly as a consequence of an increased management presence; for example, associated with the Raine Island Recovery Project and other similar monitoring or intervention activities. Particular attention needs to be paid to pest plant hygiene measures and pest animal stowaway surveillance procedures associated with bringing equipment, machinery and personal items onto the island and cays.

2.14.1 Pest plants

Observations of the vegetation on Raine Island have been recorded opportunistically since 1846. The most significant introductions to date, including various food plants, occurred during the historical periods of occupation and settlement. However, none of these particular introductions have persisted in the harsh maritime environment. The remote location, harsh conditions and limited recent human presence have limited opportunities for pest plant incursions to date. Two pest grasses are currently recorded on Raine Island – crowsfoot grass *Eleusine indica* (first recorded 1959), and coast button grass *Dactyloctenium aegyptium* (first recorded 1981). Coast button grass *Dactyloctenium aegyptium* has also been found on Moulter Cay. Neither of these grass species is considered a management issue as they have been present for some time, and their relative abundance varies with seasonal rainfall. They are currently considered unlikely to spread and impact native vegetation (Department of National Parks, Recreation, Sport and Racing 2013). Pigweed *Portulaca oleracea* has also been recorded on the National Park (Scientific) (Queensland Government 2020). The distribution of pigweed is thought to be minor and seasonally variable, and considered unlikely to adversely impact island values.

2.14.2 Pest animals

Pest animals including the domestic goat *Capra aegagrus hircus* were introduced to the island during the historical periods of occupation, with none of these introductions remaining today. The remote location, harsh conditions and limited recent human presence have limited opportunities for pest animal incursions. While at least three invasive ant species – longhorn crazy ant *Paratrechina longicornis,* ghost ant *Tapinoma melanocephalum* and wooly ant *Tetramorium lanuginosum* – appear to have made their way to the island, there is nothing to suggest anything of concern. Ongoing monitoring and species identification is required (see Appendix 5). Rodents, although not currently present, have the potential to arrive as stowaways amongst management supplies, machinery and equipment. While the harsh conditions may preclude long-term rodent establishment, there is still a threat to values (even in the short term) from potential introductions, particularly where these coincide with favourable seasonal conditions.

Appendices

Appendix 1. Legal, policy and management commitments

Gazettal details

Raine Island, Moulter Cay and MacLennan Cay were originally gazetted as the Raine Island Nature Refuge in 1997 (*Nature Conservation (Protected Areas) Amendment (No.2) No.85 1997)*. This protected area tenure was subsequently upgraded in 2007 to Raine Island National Park (Scientific) via a re-gazettal designed to afford greater protection to the area's natural and cultural values (Queensland Government 2007). It was again re gazetted in 2014 as 'national park' in response to a then state-wide policy of amalgamating the national park, national park (scientific) and national park (recovery) classes of protected area into a single 'national park' tenure. This 'national park' gazettal was terminated in 2016, and the tenure once again became National Park (Scientific)' through statutory amendment.

Applicable Acts and statutory powers

- *Nature Conservation Act 1992* (Qld)
- *Native Title Act 1993* (Cwlth)
- *Environment Protection Biodiversity Conservation Act 1999* (Cwlth)
- *Biosecurity Act 2014* (Qld)
- *Aboriginal Cultural Heritage Act 2003* (Qld)
- *Torres Strait Islander Cultural Heritage Act 2003* (Qld)
- *Queensland Heritage Act 1992* (Qld)
- *Marine Parks Act 2004* (Qld)
- *Great Barrier Reef Marine Park Act 1975* (Cwlth)

Management obligations

- Great Barrier Reef Intergovernmental Agreement 2009
- Q12006/044 – Raine Island National Park (Scientific) Indigenous Land Use Agreement

Recovery plans and guides

- Raine Island Recovery Project
- Coastal Bird Monitoring and Information Strategy: Seabirds 2015–2020 (Queensland Government 2015)
- Recovery Plan for Marine Turtles in Australia (Commonwealth of Australia 2017)
- Queensland Marine Turtle Conservation Strategy (Queensland Government 2018)
- Reef 2050 Long-Term Sustainability Plan (Commonwealth of Australia 2018)
- Caring for Raine Island Country and Culture. A strategic plan for the Indigenous cultural heritage management of the Raine Island Group (2018)
- Aboriginal and Torres Strait Islander Heritage Strategy for the Great Barrier Reef Marine Park (GBRMPA)
- The Burra Charter: The Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (1999)
- The Raine Island Climate Change Adaptation Plan 2010–2070 (Queensland Government)

Other management commitments

- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)
- CAMBA – China–Australia Migratory Bird Agreement
- JAMBA – Japan–Australia Migratory Bird Agreement
- ROKAMBA – Republic of Korea–Australia Migratory Bird Agreement
- Great Barrier Reef (Coast) Marine Park (Qld)
- Great Barrier Reef Marine Park (Cwlth)
- Wuthathi Traditional Use Marine Resource Agreement (TUMRA)

Appendix 2. Species of conservation significance

Scientific name	Common name	NC Act status	EPBC Act status	Back on Track*
Plants				
(no plants of conservation significance identified at either the State or national level)				
Animals				
Ardenna pacifica	wedge-tailed shearwater	Vulnerable	-	Low
Calidris ferruginea	curlew sandpiper	Endangered	Critically endangered	-
Charadrius leschenaultii	greater sand plover	Vulnerable	Vulnerable	Low
Chelonia mydas	green turtle	Vulnerable	Vulnerable	Critical
Hirundapus caudacutus	white-throated needletail	Vulnerable	Vulnerable	Low
Limosa lapponica baueri	Western Alaskan bar-tailed godwit	Vulnerable	Vulnerable	-
Numenius madagascariensis	eastern curlew	Endangered	Critically endangered	-
Phaethon rubricauda	red-tailed tropicbird	Vulnerable	-	Low
Pterodroma heraldica	Herald petrel	Endangered	Critically Endangered	Low

* **Back on Track** is Queensland's native species prioritisation framework

Appendix 3. Species listed in international agreements

Scientific name	Common name	CMS (Bonn)	JAMBA	ROKAMBA	CAMBA
Anous stolidus	common noddy	✓	-	-	✓
Apus pacificus	fork-tailed swift	-	✓	✓	✓
Ardenna tenuirostris	short-tailed shearwater	-	✓	✓	✓
Arenaria interpres	ruddy turnstone	✓	-	-	✓
Calidris acuminata	sharp-tailed sandpiper	*	✓	✓	✓
Calidris ruficollis	red-necked stint	✓	✓	✓	✓
Fregata ariel	lesser frigatebird	✓	✓	✓	-
Fregata minor	great frigatebird	✓	✓	-	✓
Hydroprogne caspia	Caspian tern	✓	-	-	✓
Monarcha melanopsis	black-faced monarch	*	-	-	-
Numenius phaeopus	whimbrel	✓	✓	✓	✓
Onychoprion anaethetus	bridled tern	✓	✓	-	✓
Pandion cristatus	eastern osprey	✓	-	-	-
Phaethon lepturus	white-tailed tropicbird	-	✓	-	✓
Pluvialis squatarola	grey plover	*	✓	✓	✓
Rhipidura rufifrons	rufous fantail	*	-	-	-
Sterna dougallii	roseate tern	✓	✓	-	✓
Sterna sumatrana	black-naped tern	✓	✓	-	✓
Sternula albifrons	little tern	✓	✓	✓	✓
Sula dactylatra	masked booby	-	✓	✓	-
Sula leucogaster	brown booby	✓	✓	✓	✓
Sula sula	red-footed booby	-	✓	-	✓
Symposiachrus trivirgatus	spectacled monarch	*	-	-	-
Thalasseus bergii	crested tern	-	✓	-	-
Tringa brevipes	grey-tailed tattler	✓	✓	✓	✓

This list includes local and migratory birds that have been recorded in the park.

CMS – (Bonn) Convention on the Conservation of Migratory Species of Wild Animals (*Denotes that listing here is at the family level and not necessarily this particular individual species)

CAMBA – China–Australia Migratory Bird Agreement

JAMBA – Japan–Australia Migratory Bird Agreement

ROKAMBA – Republic of Korea–Australia Migratory Bird Agreement

Appendix 4. Historic places

a. Places of historic value

Site name	Description
Raine Island tower/beacon	The Raine Island Beacon is a 14m stone tower located on the eastern side of Raine Island. Built in 1844 by convict stonemasons from Sydney, the beacon was constructed as an aid to navigation and shelter for ships journeying between Australia and Asia through the Torres Strait. Although never lit, the beacon is visible for approximately 13 nautical miles and, by providing safe passage, played a vital role in Australia's emerging colonial economy. The beacon is a landmark of national cultural significance listed on the Queensland Heritage Register. It is often referred to as the oldest remaining colonial stone building in the state.
Grave sites	The most obvious gravesite is that of Annie Eliza Ellis (the mother of the guano mine manager) who died in 1891. Marked by a prominent replica tombstone in relatively good condition, it is located adjacent to the beacon.
Quarries	Extensive quarries, primarily associated with the guano mining industry, are evident over much of the island. There is little sign of the former jetty, buildings, tramway and locomotive also linked to the mining industry.

b. Heritage Listing of the Raine Island Beacon

Queensland Heritage Register

The Raine Island Beacon was listed on the Queensland Heritage Register in 1992 as a significant place under the following four criteria (Queensland Government 2019):

Criterion A - The place is important in demonstrating the evolution or pattern of Queensland's history: Constructed as early as 1844, the Raine Island Beacon served briefly as an aid to navigation and a shelter for shipwrecked sailors, and is one of the oldest and most significant structures remaining in Queensland. Its associations with northern navigation and maritime transport, as well as the penal system and island industry are reflected in the fabric of the structure and site.

Criterion B - The place demonstrates rare, uncommon or endangered aspects of Queensland's cultural heritage: As an early navigation aid built of masonry on an isolated coral cay, the beacon is unique in form and context.

Criterion D - The place is important in demonstrating the principal characteristics of a particular class of cultural places: As an early navigation aid built of masonry on an isolated coral cay, the beacon is unique in form and context.

Criterion E - The place is important because of its aesthetic significance: It remains a landmark structure, and has an aesthetic appeal generated by its rustic materials, early workmanship, derelict nature, and dramatic, isolated ocean setting.

Australian Heritage Database

The Raine Island Beacon was listed on the Australian Heritage Database in 1982 (Australian Government 2019) under the following criteria:

Criteria D.2 and F.1: The beacon is significant as an early vernacular building in Northern Australia. Its cylindrical stone structure with crenellated trim is of technical and creative interest and shows the process of construction (from materials found or manufactured on the spot) before there were any mass-produced or imported building materials.

Criterion E.1: The beacon is also significant as a dramatic landmark feature, and as a monument to the colony's development of marine aids around the coast of Queensland and the economic development of the region.

Criterion A.4: The beacon stands as a monument to the convict way of life when inexpensive labour was used extensively at that period of time.

Appendix 5. Pests

Scientific name	Common name	*Biosecurity Act 2014* status	Historic Notes
Plants			
Eleusine indica	crowsfoot grass	not restricted	Locally considered low risk and unlikely to spread and impact native vegetation
Dactyloctenium aegyptium	coast button grass	not restricted	Locally considered low risk and unlikely to spread and impact native vegetation
Portulaca oleracea	pigweed	not restricted	Locally considered low risk and unlikely to spread and impact native vegetation
Animals			
Paratrechina longicornis	longhorn crazy ant	not restricted	Longhorn crazy ants are an introduced species that impacts many of the islands in the GBR. There is nothing to suggest that this species is currently a concern at Raine Island. Ongoing monitoring and species identification is required
Tapinoma melanocephalum	ghost ant	not restricted	This species is exotic but not known to be a problem
Tetramorium lanuginosum	wooly ant	not restricted	This species is exotic but not known to be a problem

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