

Place Details

Great Barrier Reef, Townsville, QLD , Australia

Photographs



<b>List</b>	World Heritage List
<b>Class</b>	Natural
<b>Legal Status</b>	<a href="#">Declared property</a> (30/10/1981)
<b>Place ID</b>	105060
<b>Place File No</b>	4/00/192/0001

### Statement of Significance

The Great Barrier Reef, one of Australia's first World Heritage Areas, was inscribed on the World Heritage List in recognition of its outstanding natural universal values:

- as an outstanding example representing the major stages in the earth's evolutionary history;
- as an outstanding example representing significant ongoing ecological and biological processes;
- as an example of superlative natural phenomena; and
- containing important and significant habitats for in situ conservation of biological diversity.

It is the world's largest World Heritage Area extending 2 000 kilometres and covering an area of 35 million hectares on the north-east continental shelf of Australia. Bigger than the entire area of Italy, it is probably the best known marine protected area in the world. The Great Barrier Reef's great diversity reflects the maturity of the ecosystem, which has evolved over hundreds of thousands of years. It is the world's most extensive coral reef system and is one of the world's richest areas in terms of faunal diversity.

The Great Barrier Reef World Heritage Area contains more than just coral reefs. It also contains extensive areas of seagrass, mangrove, soft bottom communities and island communities. Contrary to popular belief, the reef is not a continuous barrier, but a broken maze of coral reefs and coral cays. It includes some 2 800 individual reefs, of which 760 are fringing reefs. These reefs range in size from less than one hectare to more than 100 000 hectares, and in shape from flat platform reefs to elongated ribbon reefs.

The Great Barrier Reef provides habitats for many diverse forms of marine life. There are an estimated 1 500 species of fish and more than 300 species of hard, reef-building corals. More than 4 000 mollusc species and over 400 species of sponges have been identified.

Other well-represented animal groups include anemones, marine worms, crustaceans (prawns, crabs etc.) and echinoderms (starfish, sea urchins etc.).

The extensive seagrass beds are an important feeding ground for the dugong, a mammal species internationally listed as endangered.

The reef also supports a wide variety of fleshy algae that are heavily grazed by turtles, fish, sea urchins and molluscs.

The reef contains nesting grounds of world significance for the endangered green and loggerhead turtles. It is also a breeding area for humpback whales, which come from the Antarctic to give birth to their young in the warm waters.

The islands and cays support several hundred bird species, many of which have breeding colonies there. Reef herons, osprey, pelicans, frigate birds, sea eagles and shearwaters are among the numerous sea birds that have been recorded.

The World Heritage property is also of cultural importance, containing many middens and other

archaeological sites of Aboriginal or Torres Strait Islander origin. Some notable examples occur on Lizard and Hinchinbrook Islands, and on Stanley, Cliff and Clack Islands where there are spectacular galleries of rock paintings.

There are over 30 historic shipwrecks in the area, and on the islands are ruins and operating lighthouses that are of cultural and historical significance.

About 98 per cent of the World Heritage Property is within the Great Barrier Reef Marine Park, the remainder being Queensland waters and islands. The Great Barrier Reef Marine Park was declared in 1975 with the purpose of preserving the area's outstanding biodiversity whilst providing for reasonable use. This has been achieved using a spectrum of zones ranging from General Use Zones to Preservation Zones. In very broad terms, these zones allow ecologically sustainable activities, but all have an overriding conservation objective. Most reasonable activities such as tourism, fishing, boating, diving and research are permitted to occur but are controlled through zoning and management planning to minimise impacts and conflicts with areas of high conservation value and other users.

Today, the great majority of the Marine Park is still relatively pristine when compared with coral reef systems elsewhere in the world. An independent report published in 1997 concluded that the Reef is in good condition and is being managed effectively. These are also the findings of two major workshops to which over 100 scientists and management experts contributed. Both these workshops have now been summarised in the report titled State of the Great Barrier Reef World Heritage Area 1998, released in November 1998.

The Australian Government and State Government have a cooperative and integrated approach to management of the Great Barrier Reef World Heritage Area. The Great Barrier Reef Marine Park Authority (GBRMPA) is the Australian Government agency responsible for overall management, and the Queensland Government, particularly the Queensland Parks and Wildlife Service, provides day-to-day management to the Authority. Integrated management is also assisted by:

- a Commonwealth Act specifically for the Marine Park that, if necessary, provides over-riding powers;
- complementary legislation for most adjoining State waters;
- formal agreements with Queensland, and with various government departments, industry, research institutions and universities; and
- strategic zoning plans and site-specific management plans.

GBRMPA's current work program stems from four issues that have been identified as being critical for achieving adequate protection and management of the Reef in the short to medium term:

- water quality and coastal development;
- fisheries;
- tourism and recreation; and
- conservation, biodiversity and world heritage.

## **Official Values**

### **Criterion (IX) Outstanding examples of on-going evolution**

Biologically the Great Barrier Reef supports the most diverse ecosystem known to man and its enormous diversity is thought to reflect the maturity of an ecosystem, which has evolved over millions of years on the northeast Continental Shelf of Australia. The World Heritage values include:

- the heterogeneity and interconnectivity of the reef assemblage;
- size and morphological diversity (elevation ranging from the sea bed to 1142m at Mt. Bowen and a large cross-shelf extent encompass the fullest possible representation of marine environmental processes);
- on going processes of accretion and erosion of coral reefs, sand banks and coral cays, erosion and deposition processes along the coastline, river deltas and estuaries and continental islands;
- extensive Halimeda beds representing active calcification and sediment accretion for over 10 000 years;
- evidence of the dispersion and evolution of hard corals and associated flora and

fauna from the "Indo-West Pacific centre of diversity" along the north-south extent of the reef;

- inter-connections with the Wet Tropics via the coastal interface and Lord Howe Island via the East Australia current;
- indigenous temperate species derived from tropical species;
- living coral colonies (including some of the world's oldest);
- inshore coral communities of southern reefs;
- five floristic regions identified for continental islands and two for coral cays;
- the diversity of flora and fauna, including:
  - Macroalgae (estimated 400-500 species);
  - Porifera (estimated 1500 species, some endemic, mostly undescribed);
  - Cnidaria: Corals - part of the global centre of coral diversity and including:
    - hexacorals (70 genera and 350 species, including 10 endemic species);
    - octocorals (80 genera, number of species not yet estimated);
  - Tunicata: Ascidians (at least 330 species);
  - Bryozoa (an estimated 300-500 species, many undescribed);
  - Crustacea (at least 1330 species from 3 subclasses);
- Worms:
  - Polychaetes (estimated 500 species);
  - Platyhelminthes: include free-living Tubellaria (number of species not yet estimated), polyclad Tubellaria (up to 300 species) and parasitic helminthes (estimated 1000's of species, most undescribed);
- Phytoplankton (a diverse group existing in two broad communities);
- Mollusca (between 5000-8000 species);
- Echinodermata (estimated 800 extant species, including many rare taxa and type specimens);
- fishes (between 1200 and 2000 species from 130 families, with high species diversity and heterogeneity; includes the Whale Shark *Rhynchodon typus*);
- seabirds (between 1.4 and 1.7 million seabirds breeding on islands);
- marine reptiles (including 6 sea turtle species, 17 sea snake species, and 1 species of crocodile);
- marine mammals (including 1 species of dugong (*Dugong dugon*), and 26 species of whales and dolphins);
- terrestrial flora: see "Habitats: Islands" and;
- terrestrial fauna, including:
  - invertebrates (pseudoscorpions, mites, ticks, spiders, centipedes, isopods, phalangids, millipedes, collembolans and 109 families of insects from 20 orders, and large over-wintering aggregations of butterflies); and
  - vertebrates (including seabirds (see above), reptiles: crocodiles and turtles, 9 snakes and 31 lizards, mammals);
- the integrity of the inter-connections between reef and island networks in terms of dispersion, recruitment, and the subsequent gene flow of many taxa;
- processes of dispersal, colonisation and establishment of plant communities within the context of island biogeography (e.g. dispersal of seeds by air, sea and vectors such as birds are examples of dispersion, colonisation and succession);
- the isolation of certain island populations (e.g. recent speciation evident in two subspecies of the butterfly *Tirumala hamata* and the evolution of distinct races of the bird *Zosterops* spp);
- remnant vegetation types (hoop pines) and relic species (sponges) on islands.
- evidence of morphological and genetic changes in mangrove and seagrass flora across regional scales; and
- feeding and/or breeding grounds for international migratory seabirds, cetaceans and sea turtles.

#### **Criterion (VII) Contains superlative natural phenomena**

The Great Barrier Reef provides some of the most spectacular scenery on earth and is of exceptional natural beauty. The World Heritage values include:



- the vast extent of the reef and island systems which produces an unparalleled aerial vista;
- islands ranging from towering forested continental islands complete with freshwater streams, to small coral cays with rainforest and unvegetated sand cays;
- coastal and adjacent islands with mangrove systems of exceptional beauty;
- the rich variety of landscapes and seascapes including rugged mountains with dense and diverse vegetation and adjacent fringing reefs;
- the abundance and diversity of shape, size and colour of marine fauna and flora in the coral reefs;
- spectacular breeding colonies of seabirds and great aggregations of over-wintering butterflies; and
- migrating whales, dolphins, dugong, whale sharks, sea turtles, seabirds and concentrations of large fish.

### **Criterion (VIII) Outstanding examples of stages of earth's history**

The Great Barrier Reef is by far the largest single collection of coral reefs in the world. The World Heritage values of the property include:

- 2904 coral reefs covering approximately 20 055km<sup>2</sup>;
- 300 coral cays and 600 continental islands;
- reef morphologies reflecting historical and on-going geomorphic and oceanographic processes;
- processes of geological evolution linking islands, cays, reefs and changing sea levels, together with sand barriers, deltaic and associated sand dunes;
- record of sea level changes and the complete history of the reef's evolution are recorded in the reef structure;
- record of climate history, environmental conditions and processes extending back over several hundred years within old massive corals;
- formations such as serpentine rocks of South Percy island, intact and active dune systems, undisturbed tidal sediments and "blue holes"; and
- record of sea level changes reflected in distribution of continental island flora and fauna.

### **Criterion (X) Important habitats for conservation of biological diversity**

The Great Barrier Reef contains many outstanding examples of important and significant natural habitats for in situ conservation of species of conservation significance, particularly resulting from the latitudinal and cross-shelf completeness of the region.

The World Heritage values include:

- habitats for species of conservation significance within the 77 broadscale bioregional associations that have been identified for the property and which include:
- over 2900 coral reefs (covering 20 055km<sup>2</sup>) which are structurally and ecologically complex;
- large numbers of islands, including:
- 600 continental islands supporting 2195 plant species in 5 distinct floristic regions;
- 300 coral cays and sand cays;
- seabird and sea turtle rookeries, including breeding populations of green sea turtles and Hawksbill turtles; and
- coral cays with 300-350 plant species in 2 distinct floristic regions;
- seagrass beds (over 5000km<sup>2</sup>) comprising 15 species, 2 endemic;
- mangroves (over 2070km<sup>2</sup>) including 37 species;
- Halimeda banks in the northern region and the unique deep water bed in the central region; and
- large areas of ecologically complex inter-reefal and lagoonal benthos; and
- species of plants and animals of conservation significance

## Description

Includes the world's most extensive stretch of coral reef. The reef system, extending to Papua New Guinea, comprises some 3,400 individual reefs, including 760 fringing reefs, which range in size from under 1ha to over 10,000ha and vary in shape to provide the most spectacular marine scenery on earth. There are approximately 300 coral cays, including 213 unvegetated cays, 43 vegetated cays and 44 low wooded islands. There are also 618 continental islands which were once part of the mainland (GBRMPA, pers. comm., 1995).

The form and structure of the individual reefs show great variety. Two main classes may be defined: platform or patch reefs, resulting from radial growth; and wall reefs, resulting from elongated growth, often in areas of strong water currents. There are also many fringing reefs where the reef growth is established on subtidal rock of the mainland coast or continental islands (Kelleher *et al.*, 1989).

Capricorn-Bunker Group National Park (Queensland State) encompasses a terrestrial section and consists of four islands: Fairfax Island, a coral cay consisting of two small islands on an egg-shaped reef; Hoskyn Island similar to Fairfax, though not a cay; Heron Island, sand and broken coral on coral and rock formation; and Lady Musgrave Island, a cay surrounded by extensive coral reefs.

Water circulation is very complex, governed by properties of the Coral Sea, land run-off, evaporation, the south-east trade winds, forced upwellings due to strong tidal currents in narrow reef passages and coastal waters including mangroves. Tides are generally semi-diurnal with diurnal inequality towards the north, becoming almost diurnal in Torres Strait. The maximum tidal range is about 3m along most of the coast, although increasing to 6 to 9m in the Broad Sound area between 21 degrees and 23 degrees S. Water is vertically well-mixed for most of the year with stratification occurring due to freshwater input during January to April. Freshwater run-off can be very localised and significant physical and biological effects may be expected (Kelleher *et al.*, 1989).

## History

The Great Barrier Reef Marine Park Act 1975 provides for the establishment, control, care and development of a Marine Park covering 98.5% of the Great Barrier Reef Region as defined in that Act. Parts of Green Island (1937) and Heron Island (1943) were gazetted as national parks under the State Forests and National Parks Act 1903-1948 (Queensland). Heron-Wistari and Green Island Marine Parks (1974), gazetted under the Forestry Act 1959-1976 (Queensland), were the first Marine Parks on the reef. Areas of the region may be declared as part of the Marine Park and subsequently zoned. In 1976 these powers were transferred to the National Parks and Wildlife Act 1976 and Fisheries Act 1976, respectively. The first section of the Great Barrier Reef Marine Park, the Capricornia Section, was proclaimed in 1979. The Cairns and Cormorant Pass sections were declared as part of the Marine Park in late 1981 and the remainder of the Marine Park in subsequent years. The whole area was inscribed on the World Heritage List in 1981.

## Condition and Integrity Not Available

### Location

About 34,870,000ha, comprising an area bounded by a line which –

- (a) commences at the point that, at low water, is the northernmost extremity of Cape York Peninsula, Queensland,;
- (b) runs thence easterly along the geodesic to the intersection of parallel of Latitude 10 degrees 41 minutes South with meridian of Longitude 145 degrees East;
- (c) runs thence southerly along that meridian to its intersection by the parallel of Latitude 13 degrees South;
- (d) runs thence south-easterly along the geodesic to a point of Latitude 15 degrees South Longitude 146 degrees East;
- (e) runs thence south-easterly along the geodesic to a point of Latitude 17 degrees 30 minutes South Longitude 147 degrees East;
- (f) runs thence south-easterly along the geodesic to a point of Latitude 21 degrees South Longitude 152 degrees 55 minutes East;
- (g) runs thence south-easterly along the geodesic to a point of Latitude 24 degrees 30 minutes South Longitude 154 degrees East;
- (h) runs thence westerly along the parallel of Latitude 24 degrees 30 minutes South to its intersection by the coastline of Queensland at low water ; and
- (i) runs thence generally northerly along that coastline at low water to the point of commencement.

## **Bibliography**

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