
AUSTRALIAN NATIONAL PERIODIC REPORT

SECTION II

Report on the State of Conservation of Great Barrier Reef

II.1. INTRODUCTION

a. State Party

Australia

b. Name of World Heritage property

Great Barrier Reef World Heritage Area

c. Geographical coordinates to the nearest second¹

Northern boundary = northern extremity of Cape York Peninsula (at low water) east to 10°41' South, 145° 00' East; the GBRWHA then extends generally south-easterly for more than 2,000km off the east coast of Australia. The southern boundary = 24°30' South, 154°00' East, west to the coastline of Queensland (at low water).

d. Date of inscription on the World Heritage List

30 October 1981

e. Organization responsible for the preparation of the report

Great Barrier Reef Marine Park Authority

II.2. STATEMENT OF SIGNIFICANCE

Criteria

One of Australia's first World Heritage areas, the Great Barrier Reef met all four of the World Heritage criteria for listing in 1981 as a natural property [1]; namely:

- being an outstanding example representing a major stage of the earth's evolutionary history;
- being an outstanding example representing significant ongoing geological processes, biological evolution and man's interaction with his natural environment;
- containing unique, rare and superlative natural phenomena, formations and features and areas of exceptional natural beauty; and
- providing habitats where populations of rare and endangered species of plants and animals still survive.

The values table set out below includes the updated wording for all four natural criteria as recognised by the World Heritage Committee today

Justification for listing

The original nomination document [1] provides the justification (pp. 4-6) for the World Heritage (WH) listing. The report by Lucas *et al* [2] gives a detailed explanation of the

¹ Since the GBRWHA is such a large area, co-ordinates are specified to the nearest minute.

justification (pp 50-53) outlining the natural attributes which match each of the criteria and comparing the 1981 criteria with the 1996 criteria (Lucas *et al* concluded “*it was unnecessary to make any adjustments to the justification due to the changes in criteria*”). The IUCN website [3] also provides additional details for the listing.

While the coral reefs initially made the area famous, the Great Barrier Reef World Heritage Area (GBRWHA) comprises an extraordinary variety of other communities, habitats and their associated ecological processes including:

- mangrove estuaries)
- sandy & coral cays) *Bioregions indicating this*
- continental islands) *biodiversity have now been*
- seagrass beds) *mapped (see map of*
- algal & sponge ‘gardens’) *Bioregions [4]*
- sandy or muddy bottom communities)
- continental slopes and deep ocean troughs)

This extraordinary biological diversity provides habitats for many diverse forms of marine life and species, including those listed in Table 1:

Table 1 – Summary of significant features of GBRWHA

six of the world’s seven species of marine turtle [5]	the largest green turtle breeding area in the world
one of the world’s most important dugong populations [6]	over 3000 km ² of seagrass meadows
a breeding area for humpback and other whale species [7]	Over 2900 coral reefs built from over 360 species of hard coral
more than 1500 species of fish	1500 species of sponges equalling 30% of Australia’s diversity in sponges
2200 species of native plants which is 25% of Queensland’s total native plant species	800 species of echinoderms (e.g. sea stars) = 13% of the world’s total species
over 5000 species of molluscs	over one third of all the world’s soft coral and sea pen species (80 species)
over 175 species of birds	approximately 500 species of seaweeds
over 2000 km ² of mangroves including 54% of the world’s mangrove diversity	spectacular seascapes and landscapes e.g. Hinchinbrook Island, the Whitsundays
extensive diversity of reef morphologies and geomorphic processes	complex cross-shelf and longshore connectivity [8]

The biodiversity and the interconnectedness of species and habitats makes the Great Barrier Reef and the surrounding areas one of the richest and most complex natural systems on earth. While coral reef, mangrove and seagrass habitats occur elsewhere on the planet, no other World Heritage Area contains such biodiversity. As the world’s largest coral reef ecosystem, it is also a critical global resource (Refer [1-3,9, Values Table] for more details).

The geographic extent of the Great Barrier Reef including the area north of the Marine Park boundary, extending beyond Cape York and into the Torres Strait [10], is culturally important to both Aboriginal and Torres Strait Islander people.

Indicative Values Table

The EPBC Act prohibits actions that have “a significant impact on the World Heritage values of a declared World Heritage property”, unless the action is approved, or in accordance with an accredited management plan. The World Heritage values of a property are the natural heritage and cultural heritage contained in the property, which have the same meaning given by the World Heritage Convention.

The following indicative World Heritage values table includes examples of the World Heritage values for which the Great Barrier Reef was listed for each World Heritage List criterion. These are, in the Commonwealth’s view, the statements of the outstanding universal values of each World Heritage property. While these examples are illustrative of the World Heritage values of the property, they do not necessarily constitute a comprehensive list of these values.

World Heritage Values	Examples of attributes of the Great Barrier Reef which reflect the World Heritage Values
<p>The Great Barrier Reef provides a habitat for rare and threatened species of plants and animals and for <i>in situ</i> conservation of biodiversity.</p>	<ul style="list-style-type: none"> • The integrity of the inter-connections between reef and island networks in terms of dispersion, recruitment, and the subsequent gene flow of many taxa. • The diversity and range of habitats, which result from the latitudinal and cross-shelf completeness of the region. • 70 identified broadscale bioregional associations. Habitats include: <ul style="list-style-type: none"> - 15 Seagrass beds species, 2 endemic, over 5000km²; - 37 species of mangrove trees over approximately 2070km²; - ecologically complex inter-reefal and lagoonal benthos; - 20 species <i>Halimeda</i> banks, actively accumulating for up to 10,000 years, in northern region and unique deep water bed in central region; - over 2900 structurally and ecologically complex coral reefs covering 20 055km²; - islands, including: <ul style="list-style-type: none"> - 600 continental islands supporting 2195 plant species with several endemic and 74 rare or threatened species, 5 distinct floristic regions; - 300 coral cays and sand cays; - seabird and sea turtle rookeries including the breeding population of green sea turtle and the Hawksbill breeding population on vegetated cays; - 300-350 plant species and 2 distinct floristic regions. • Major taxonomic groups including: <ul style="list-style-type: none"> - estimated 400-500 species Macroalgae; - estimated 1500 species Porifera, some endemic, mostly undescribed; - Cnidaria: Corals.- part of the global centre of coral diversity: <ul style="list-style-type: none"> - 70 genera of hexacorals, 350 species. 10 species endemic; - 80 genera of octacorals, number of species currently unknown; - at least 330 species Tunicata: Ascidians; - estimated 300-500 Bryozoa largely unknown species; - at least 1330 Crustacea species from 3 subclasses; - worms: <ul style="list-style-type: none"> - estimated 500 Polychaetes species; - Platyhelminthes: include taxa from all groups; - diverse Phytoplankton group existing in two broad communities; - between 5000-8000 Mollusca species; - estimated 800 extant Echinodermata species including many rare taxa and type specimens;

World Heritage Values	Examples of attributes of the Great Barrier Reef which reflect the World Heritage Values
	<ul style="list-style-type: none"> - between 1200 and 2000 fish species from 130 families with high species diversity and heterogeneity. Includes the Whale Shark <i>Rhynchodon typus</i>; - between 1.4 and 1.7 million breeding seabirds (threatened species include the Roseate tern, little tern); - marine reptiles: <ul style="list-style-type: none"> - 6 sea turtle species (all listed as critically endangered, endangered or vulnerable); - 17 sea snake species; - 1 crocodile: species listed as vulnerable. - marine mammals: <ul style="list-style-type: none"> - 1 species <i>Dugong dugon</i> listed as vulnerable. - 26 whales and dolphins species, some listed as vulnerable (status of most species is unknown); - terrestrial flora: see "Habitats: Islands" - terrestrial fauna: <ul style="list-style-type: none"> - invertebrates including pseudoscorpions, mites, ticks, spiders, centipedes, isopods, phalangids, millipedes, collembolans and 109 families of insects from 20 orders. Large over-wintering aggregations of butterflies on some islands. - vertebrates: <ul style="list-style-type: none"> - seabirds (see above). - reptiles: crocodiles and turtles, see above. Largely unstudied, 9 snakes and 31 lizards including some vulnerable endemic species, - mammals: eg proserpine rock wallaby, listed as endangered..
<p>The Great Barrier Reef has outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, coastal and marine ecosystems and communities of plants and animals.</p>	<ul style="list-style-type: none"> • Extensive diversity of flora and fauna including all marine phyla. • The reef assemblage of inter-connected components. • 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. • Indigenous temperate species derived from tropical species. • Inter-connections with the Wet Tropics via the coastal interface and Lord Howe Island via the East Australia current. • Processes of dispersal, colonisation and establishment of plant communities within the context of island biogeography (e.g: the dispersion of seeds by air, sea and through vectors such as birds are examples of dispersion, colonisation and succession). • Five floristic regions identified for continental islands and two for coral cays. • The isolation of certain island populations (e.g. recent speciation evident in describing two subspecies of the butterfly <i>Tirumala hamata</i> and the evolution of distinct races of the bird <i>Zosterops spp</i>). • Evidence of morphological and genetic changes in mangrove and seagrass flora across regional scales. • Feeding and/or breeding grounds for international migratory seabirds, cetaceans and sea turtles. • Living coral colonies (including some of the world's oldest). • Inshore coral communities of southern reefs.
<p>The Great Barrier Reef has outstanding examples representing major stages of earth's history including:</p> <ul style="list-style-type: none"> • the record of life; • significant geomorphic & physiographic features, an 	<ul style="list-style-type: none"> • 2904 coral reefs covering approximately 20 055km². • Reef morphologies reflecting historical and on-going geomorphic and oceanographic processes. • 300 coral cays and 600 continental islands. • Processes of geological evolution linking islands, cays, reefs and changing sea levels, together with sand barriers, deltaic and associated sand dunes. • Extensive <i>Halimeda</i> beds. • Formations such as serpentine rocks of South Percy island, intact and active dune systems, undisturbed tidal sediments and "blue holes". • Record of sea level changes and the complete history of the reef's evolution are recorded in the reef structure. • Record of sea level changes reflected in distribution of continental island flora and fauna.

World Heritage Values	Examples of attributes of the Great Barrier Reef which reflect the World Heritage Values
<p>extensive diversity of reef morphologies & coastal attributes of world importance; and</p> <ul style="list-style-type: none"> on-going geological processes in the development of landforms. 	<ul style="list-style-type: none"> Remnant vegetation types (hoop pines) and relic species (sponges) on islands. Record of climate history, environmental conditions and processes extending back over several hundred years within old massive corals. 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.
<p>The Great Barrier Reef contains superlative natural phenomena and areas of exceptional natural beauty and aesthetic importance.</p>	<ul style="list-style-type: none"> The vast extent of reef and island systems and the aerial vista. Islands ranging from towering forested continental islands complete with freshwater streams to coral cays and unvegetated sand cays. Coastal and adjacent island systems with mangrove systems. Rich variety of landscapes and seascapes including rugged mountains with dense and diverse vegetation and adjacent fringing reefs. Abundance and diversity of shape, size and colour of marine fauna and flora in coral reefs. Breeding colonies of seabirds and aggregations of over-wintering butterflies. Animals including migrating whales, dolphins, dugong, whale sharks, sea turtles, seabirds and concentrations of large fish. High level of community appreciation.

Further information on values and attributes within the GBRWHA are given in the following publications:

- *"The Outstanding Universal Value of the Great Barrier Reef World Heritage Area"* (Lucas, P, Webb, T, Valentine, P & Marsh, H, 1997).
- *State of the Great Barrier Reef World Heritage Area 1998"* Report (GBRMPA, 1998).

Additional information since listing

In 1998 the report *'State of the Great Barrier Reef World Heritage Area 1998'* [12] was released providing a comprehensive assessment of the condition of WH values. This was the first ever synthesis of all available information on the state of the environment, human pressures on the environment and management responses to those pressures for the entire GBRWHA. The report is divided into two main parts: 'Environmental Status' and 'Management Status'. The 'Environmental Status' section considers the status of WH values including water quality, mangroves, island plants, seagrasses, macroalgae, corals, crown-of-thorns starfish, fishes, birds, reptiles, marine mammals, and inter-reefal and lagoonal benthos. Each of these environmental categories was treated according to the State-Pressure-Response model [13]. The overall picture was that while some elements of the GBR are subject to intensive human pressures, the ecosystem as a whole is in good health. This State of the GBRWHA report is currently being updated by GBRMPA.

The original nomination document for the GBRWHA [1] referred to cultural heritage within the GBR (pp 15-17), but the property was only listed by the WH Committee for its natural values. Nevertheless all the cultural attributes described in the nomination are today dealt with through legislative mechanisms (for example, all historic shipwrecks are managed with State delegations under Federal legislation [14]; similarly most archaeological and historical sites are covered by both State and Federal legislation).

Lucas *et al* [2] noted that there were many strategies (pp. 77- 81) focussing on matters of cultural heritage outlined in the 25 Year Strategic Plan [15]; many of these strategies have been, or are now being, addressed.

The cultural importance of the GBRWHA for Aboriginal and Torres Strait Islanders is acknowledged and there are a range of measures being undertaken under Federal and State legislation to protect those cultural values. The social and economic importance of the GBRWHA for all local communities, including Indigenous groups, and users is also becoming increasingly important.

While considerable new information about the GBRWHA and its outstanding universal significance has been collated since the Area was listed, this information does not necessitate any changes under the four natural criteria for which the Area was listed. All WH values within the GBRWHA are effectively protected and managed and the GBRWHA continues to meet all four natural criteria under the revised WH criteria.

II.3. STATEMENT OF INTEGRITY

The report by Lucas *et al* [2] provides a detailed assessment of the natural attributes which match the four criteria for world heritage (see 'Justification' above) and addresses integrity issues (page 68). Lucas *et al* also conclude "the scale of the GBRWHA is one of two fundamental issues giving rise to the outstanding universal value of the Area" (page 85). The *State of the GBRWHA report 1998* [12] also gives an overview of the integrity of the property and the changes that have occurred since the property was listed.

Neither the GBRWHA nor the Marine Park are static and hence neither is the management for either area. Use patterns and technology are constantly changing and the marine environment itself is dynamic - subject to both human use and natural impacts [16].

Activities that affect the health of the GBR ecosystem can also originate outside the Marine Park. The Great Barrier Reef Marine Park Authority (GBRMPA) prepared a report *Great Barrier Reef Water Quality: Current Issues and Management 2001* which identified the range of catchment activities and their potential impacts. In September 2001 GBRMPA released its *Great Barrier Reef Catchment Water Quality Action Plan* [17] which identified end of catchment targets for a number of pollutants which would achieve significant reductions in these pollutants entering the Marine Park. GBRMPA is presently working with other government agencies responsible for the management of activities in the GBR Catchment to introduce improved land management practices to achieve the identified water quality targets.

Maintenance of values

Refer to *Part II.5* 'Factors affecting the property' for discussion of the four most critical issues facing the GBRWHA and the WH values at this time. A number of major programs are underway to address such issues as adverse water quality, tourism impacts in specific high use areas, unsustainable fishing practices and better protection of biodiversity (details in Part II.5)

Boundaries and Buffer Zones

No revision of the GBRWHA boundary has occurred since listing as a WH property. The extent of the GBR Marine Park, however, has increased and now comprises 99.25% of the GBRWHA. The GBRWHA covers 348,000 km² (an area bigger than the United Kingdom, Holland and Switzerland combined), and extends from low water mark on the mainland coast to the outer (seaward) boundary of the GBR Marine Park [18].

The World Heritage areas not included in the Commonwealth's GBR Marine Park comprise islands under State (Queensland) jurisdiction (~50% of these are national parks), internal waters of Queensland (*many of which are State Marine Parks*[18]) and a number of small exclusion areas (*State waters*) around major ports/urban centres (refer to map at [10]). The majority of these areas are not included in the Commonwealth's Marine Park by way of an agreement between the Commonwealth and the States.

As well as the waters within the outer boundaries [10], the GBR Marine Park includes:

- the subsoil beneath the seabed to a depth of 1000 metres; and
- the airspace above the waters to height of 915 metres ASL[19].

In terms of 'buffering', the zoning spectrum provides for increasing levels of protection for the more restrictive zones within the Marine Park. In addition, the GBRMP Act has provision for regulations allowing controls on certain activities that occur outside the Marine Park. The most recent application has been Regulations that control point source discharges from new aquaculture developments up to 5 km inland of the Marine Park boundary [20]. The Commonwealth's EPBC Act [21] also has provisions to control activities that may occur outside, but may adversely impact, World Heritage areas. All the above provisions can be viewed as effectively providing 'buffering' for WH values.

II.4. MANAGEMENT

International

In addition to the World Heritage Convention, a number of other international conventions signed by Australia, including those listed below, apply to the GBRWHA or parts of it:

- Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar, 1971) [22]; (*two areas within the GBRWHA are designated Ramsar sites - Bowling Green Bay; Shoalwater Bay/ Corio Bay*)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973) [23];
- Convention on Conservation of Migratory Species of Wild Animals (Bonn Convention 1979) [24];
- Convention on the Law of the Sea (UNCLOS 1982) [25];
- International Convention for the prevention of pollution at sea (MARPOL) [26]; and
- Convention on Biological Diversity (CBD 1992) [27];

In addition, the International Maritime Organization (IMO) has declared the entire GBR as a *'Particularly Sensitive Sea Area'* (this allows for compulsory pilotage for large vessels transiting certain areas of the GBR).

A number of migratory birds which occur in the GBRWHA are covered by international agreements between the Australian Government and the Governments of Japan and China (JAMBA and CAMBA respectively).

National legislation and controls

- The *Great Barrier Reef Marine Park Act* [19] was enacted in 1975 "to provide for the protection, wise use, understanding and enjoyment of the Great Barrier Reef in perpetuity..."; in other words, to protect the area's outstanding biodiversity whilst providing for reasonable use. This has been achieved using a spectrum of multiple-use zones ranging from General Use Zones where most reasonable activities can occur, through to National Park Zones (no-take zones which provide opportunities to see and enjoy the diversity of the Reef but where no fishing or collecting are allowed), to Preservation Zones (reference areas which are off limits to virtually everyone except for limited scientific research). The current zoning is at [28].

All zones have an overriding objective of environmental conservation [29]. Zoning is a spatial planning system that allows ecologically sustainable activities to occur, but separates conflicting uses and determines the appropriateness of various activities. The *GBRMP Act* [19] provides for reasonable use. Activities, such as tourism, fishing, boating, diving and research, are permitted in specific zones but are regulated to minimise impacts and conflicts with other users.

- The *Environment Protection & Biodiversity Conservation Act 1999* [21], which came into force in July 2000, also provides for the protection of world heritage values as well as environmental protection, biodiversity conservation, and the protection of threatened and migratory species (refer to Part II.2 of this Report).
- *The Environment Protection (Sea Dumping) Act 1981* [30] prohibits dumping of waste or other matter (including spoil) from any vessel, aircraft or platform in Australian waters unless a permit has been issued.

There are numerous other Commonwealth Acts and Regulations which enhance the protection and conservation of the GBRWHA. This legislation covers such aspects as a prohibition on mining, shipping, pollution, navigation aids, native title, aquaculture, historic shipwrecks, sea installations, and heritage protection [31].

State legislation and controls

Almost 50% of the State islands within the GBRWHA are National Parks under the (Queensland) *Nature Conservation Act 1992* [32]. The tenure on the other islands is either leasehold, freehold or Deed-of-Grant in Trust (DOGIT) lands.

The *Nature Conservation Act* also deals with the protection of endangered, vulnerable, rare and common wildlife species prescribed by regulation.

In some areas within the GBRWHA, the tidal lands and tidal waters are declared as State Marine Parks under State Marine Park legislation (*Marine Parks Act 1982*) [18] to complement the provisions of the adjoining Commonwealth Marine Park.

Other State legislation which is relevant within the GBRWHA includes [33]:

- *Coastal Protection and Management Act 1995* - provides for the protection, conservation, rehabilitation and management of the coast and coastal waters including its resources and biological diversity;
- *Environmental Protection Act 1994* - the principal State Act addressing water and air quality and pollution including noise (and makes provision for approvals or licences to discharge);
- *Integrated Planning Act 1997* – provides planning tools and an Integrated Development Assessment System for development activities on State or private land in and adjacent to the GBRWHA based on the principles of ecological sustainability;
- *State Development and Public Works Organisation Act 1971* – provides a framework for undertaking environmental impact assessments of major projects in and adjacent to the GBRWHA;
- *Fisheries Act 1994* – the principal State Act addressing the management of most fisheries and fish resources in the GBR; and
- *Transport Infrastructure Act 1994* – provides the framework for ‘land use plans’ and ‘development plans’ for all Queensland ports.

Other State legislation relevant to the GBRWHA covers matters including marine safety, dredging, beach protection, pollution and native title.

Administrative and contractual arrangements

The Australian (= Commonwealth) Government coordinates management of the GBRWHA. This complex task balances reasonable human use with the maintenance of the Area's natural and cultural integrity. The enormity of the task is compounded by the sheer size of the GBRWHA, its economic importance, the political and the jurisdictional complexities determined by Australia's system of Federalism, the close proximity of rural and urban populations to the coast, the range of users and interest groups whose use patterns frequently compete and displace each other, the need for equity and fairness in access to resources, and the ecological diversity of the region.

The Commonwealth Government, through the Great Barrier Reef Marine Park Authority (‘the Authority’ or the Board) has responsibility for the Marine Park, and GBRMPA is the Commonwealth agency responsible for overall planning and management.

Day-to-day management (DDM) of the GBRWHA (which includes the GBR Marine Park, State marine parks and island national parks [34]) is achieved through an agreement (the 1979 Emerald Agreement) between the Commonwealth and Queensland Governments. DDM is predominantly delivered by the Queensland Parks and Wildlife Service (a component of the Qld Environmental Protection Agency), although it also utilises other State and Commonwealth agencies such as the Qld Boating and Fisheries Patrol, Queensland Water Police, Coastwatch, Customs National Marine Unit, and the Australian Maritime Safety Authority.

Both Governments provide matching funds for the DDM program which primarily relates to enforcement, surveillance, monitoring and education/interpretation. The program is overseen by a Management Strategy Group and a Management Operations

Group, both of which contain representatives from GBRMPA and QPWS. In addition, one member of the four person Marine Park Authority is a Queensland Government representative.

This cooperative approach to DDM recognises the efficiencies to be made through the integration of marine park and island national park management, and through utilisation of existing Queensland Government infrastructure and resources strategically located in Queensland coastal centres.

Effective and integrated management is enhanced by a variety of means, including:

- a single independent agency (GBRMPA) with an Act [19] which, if necessary, provides overriding powers;
- strong cooperation with the State (Queensland) Government through formal agreements, various departments, industry, research institutions and universities - especially through the Cooperative Research Centre (CRC) for the GBRWHA [35];
- complementary legislation for most adjoining State waters;
- a single DDM unit operating under both Commonwealth and Queensland legislation; and
- strategic zoning plans and site-specific management plans [36].

The GBRMPA is working with Queensland agencies to ensure that any planning for State Marine Parks and GBRMPA's Representative Areas Program [37] (see Part II.5 below) are complementary.

Indigenous involvement

Aboriginal and Torres Strait Islander people have relied on the reef and coastal seas for thousands of years for traditional resources and customary practices. Today over 70 coastal Aboriginal and Torres Strait Islander groups maintain strong cultural relationships to areas within the GBRWHA. Some 11 native title claims [38] are registered over parts of the GBRWHA.

The ongoing cultural association, use, aspirations and enjoyment of sea estates needs to be given due recognition by management agencies. The GBRMPA is working in partnership with native title claimants in managing the GBRWHA and claimants and their representatives are consulted about all permit applications.

The social, spiritual and economic rights, interests and values that Indigenous people place upon the marine environment demonstrates an affiliation with tradition and traditional areas. Important cultural sites and values exist on many islands and reefs in the Great Barrier Reef region. Commercial activities such as shipping, tourism and fishing can result in the displacement of traditional activities and disrupt culture; however these also offer opportunities for social and economic aspirations. Various proposals have been developed by coastal Aboriginal groups to incorporate their interests into Marine Park and WHA management, including several proposals for Indigenous co-operative management, and these are currently being investigated.

Plans for the management of the GBRWHA (refer to Table 2)

Contact details for the primary management agency

Great Barrier Reef Marine Park Authority

PO Box 1379, Townsville

QUEENSLAND

AUSTRALIA 4810

Tel: +61 7 4750 0700;

Fax: +61 7 4772 6093;

Email: info@gbbrmpa.gov.au

website: www.gbbrmpa.gov.au

Staffing and financial resources

Total GBRMPA staffing at 30 June 2001 was 157 personnel who are based mainly in Townsville (this includes Reef HQ staff and two staff based full-time in Canberra). In addition, the jointly funded DDM Program directly employs some 94 full-time equivalent staff within QPWS who are located at various centres along the GBR coast. Management is also supported by other resources of the Queensland Environmental Protection Agency (which incorporates QPWS) and by staff from a range of supporting agencies as discussed previously.

The operating expense of the GBR Marine Park Authority for managing the Marine Park in 2000-01 was AUD\$30.6 million [39], which included payments to DDM, contributions to the CRC for GBRWHA [35], a one-off allocation for the refurbishment of the Reef HQ Aquarium and major funding for increased enforcement and surveillance.

It is difficult to estimate the total annual expenditure to manage the GBRWHA across all relevant agencies and interest groups. When the totality of expenditure is taken into account (for policy development, management, monitoring and research), estimated expenditure is in the order of AUD\$78 million per annum; this involves agencies of the Commonwealth and Queensland Governments, universities and the private sector.

An Environmental Management Charge (EMC) came into effect in July 1993. Most commercial operations in the Marine Park are subject to the charge, including tourist operations, mariculture, and land-based marine sewage outfalls [40]. A proportion of the EMC is provided for research for management through the Reef Cooperative Research Centre.

Table 2 - Plans for the management of the GBRWHA

Area	Detailed area	Planning tools	Basis for the plan	Jurisdiction
GBRWH A	Entire GBRWHA (incl. all other areas listed below)	25 Year Strategic Plan [15]	Advisory only, but developed in 1991-94 and endorsed by some 60 stakeholders when released.	Commonwealth

Waters	Great Barrier Reef Marine Park (<i>waters below LWM</i>) = 99.25% of <i>GBRWHA</i>	GBRMP Zoning Plans Plans of Management (in specific key areas only) [36]	Statutory (<i>as specified in s. 32 & 33 of GBRMP Act 1975</i>) [19] Statutory (<i>as specified in s. 39V-39ZI of GBRMP Act 1975</i>)	Commonwealth
	Intertidal waters (HWM to LWM)	State Marine Park Zoning Plans; and/or; State Coastal Management Plan; and/or Regional Coastal Management Plans (where applicable)	Statutory (<i>as specified in Qld Marine Parks Act</i>) [18] Statutory (<i>as specified in the Coastal Protection & Management Act</i>) Statutory (<i>as specified in the Coastal Protection & Management Act</i>)	State
	Internal waters of Qld	State Marine Park Zoning Plans [18]; and/or State Coastal Management Plan; and/or Regional Coastal Management Plans (where applicable)	Statutory (<i>as specified in Qld Marine Parks Act</i>) [18] Statutory (<i>as specified in the Coastal Protection & Management Act</i>) Statutory (<i>as specified in the Coastal Protection & Management Act</i>)	State
	Waters as defined in the plans	Queensland Fisheries Management Plans (<i>eg East Coast Trawl Management Plan</i>)	Statutory (<i>as specified in the Qld Fisheries Act</i>)	State & Commonwealth
Islands	Commonwealth Islands	Included in GBRMP so covered by all GBRMP zoning provisions and regulations	Statutory (<i>as specified in s. 32 & 33 of GBRMP Act 1975</i>)	Commonwealth
	National Park Islands (Qld)	Management plans	Statutory (<i>as specified in Qld Nature Conservation Act 1992</i>) [32]	State
	Freehold land/other tenures on islands	Local Gov Planning Schemes; and/or Local Govt Development Control Plans; and/or Regional Plans/Planning Strategies and/or; State Coastal Management Plan; and/or Regional Coastal Management Plans (where applicable)	Statutory under <i>Integrated Planning Act</i> (ESD is main object) Statutory (<i>as specified in the Coastal Protection & Management Act</i>) Statutory (<i>as specified in the Coastal Protection & Management Act</i>)	State
Exclusion areas (eg ports not within GBRMP)	State waters	State Coastal Management Plan; and/or Regional Coastal Management Plans (where applicable) Port Land Use Plans	Statutory (<i>as specified in the Coastal Protection & Management Act</i>) Statutory (<i>as specified in the Coastal Protection & Management Act</i>). Statutory (<i>under the Transport Infrastructure Act 1994</i>).	State

Scientific and technical studies

A wide range of research institutions conduct scientific and technical studies throughout the GBRWHA, including the Cooperative Research Centre for the GBRWHA, the Australian Institute of Marine Science, various universities, other government agencies and research organisations, island research stations and museums.

The Cooperative Research Centre for the GBRWHA (known as the Reef CRC) was established in July 1993 as a joint venture between James Cook University, the marine tourism industry, scientific bodies and the GBRMPA. It undertakes an integrated program of applied research and development, training and extension aimed at enhancing the viability of, and expanding, sustainable Reef-based industries and economic activity, and provides an improved scientific basis for Reef management and regulatory decision making.

In 2001, GBRMPA developed a comprehensive list of its high priority research needs for the management of the Marine Park and World Heritage Area [41]. These priorities are used to strategically co-ordinate research on the GBR to provide information that is directly relevant and useful for GBRMPA's high priority management needs. This represents a new direction in management driven research where the Authority has, for the first time, taken the initiative of proactively informing researchers of our information requirements by publishing our priorities externally on GBRMPA's website.

Since the WH listing of the GBRWHA in 1981, there have been many hundreds of scientific and technical studies and research projects undertaken throughout the GBR (for example [42]); details of some of the more recent publications can be found on the websites for:

- GBRMPA Research Publications [43]
- CRC for the Great Barrier Reef World Heritage Area [44]
- Australian Institute of Marine Science [45]; and
- Island research stations (for example [46]).

Visitors

(See comments under 'Tourism and Recreational Use' in Part II.5 below).

Education, interpretation and awareness raising

A wide range of interpretive activities (face-to-face, publications, etc) are undertaken by DDM officers and others in Q.EPA in relation to the reefs and islands.

The Reef HQ Educational Program plays a major role in raising reef awareness for visitors to the Reef HQ Aquarium [47] in Townsville and to schools throughout the country by school visits and video-link programs.

There is a wide range of educational, interpretive and awareness building programs and products available for the GBRWHA [48, 49]; some of the many publications include:

- Zoning Plans and Introductory Guides for each Section of the Marine Park
- State of the GBRWHA Report (1998) [12]
- 'Tourism Operators Handbook for the Great Barrier Reef' [50];
- 'Interpretive Manual for Reef Guides'

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- Numerous brochures (for example ‘Protecting the GBRWHA’ [51])
 - Numerous bulletins and leaflets (for example, updates for the Representative Areas Program [52, 72])

Reactive Monitoring reports

In December 1999, the WH Committee accepted the “Focussed Recommendations” and the “Framework for Management” [53] for the GBRWHA. These had been derived from a report prepared by ACIUCN in March 1999 [54] which included 29 recommendations and which subsequently led to the identification of five priority action areas addressed in the above reports accepted by the Committee:

1. The Management of Land and Coastal Catchments
2. The Management of Fisheries
3. The Management of Shipping and Ship-sourced Marine Pollution
4. Representative Marine Protected Areas
5. Resources for Research and Management.

Since the December 1999 report was accepted by the WH Committee, updates for the ‘Framework for Management’ have been provided periodically to the WH Bureau and/or Committee. The latest update of this document is available at:
http://www.gbrmpa.gov.au/corp_site/info_services/publications/brochures/protecting_biodiversity/gbrwha_management_framework.pdf.

II.5. FACTORS AFFECTING THE PROPERTY

GBRMPA has identified four critical issues currently facing the GBRWHA, which relate to:

- water quality issues and coastal development
- increasing fishing effort and impacts
- increasing tourism and recreational use; and
- the maintenance of conservation, biodiversity and World Heritage values.

There are many management actions and strategies underway (examples outlined in *italics* below) to address these critical issues. Other factors which are affecting the GBRWHA, such as increased coral bleaching, are primarily outside the control of the managing agencies, but are also outline below.

- **Water quality and coastal development**

Declining water quality resulting primarily from terrestrial runoff is one of the greatest threats facing the inshore areas of the GBRWHA. Sediment and nutrient inputs to the Reef from terrestrial discharge are estimated as increasing fourfold over the last 150 years; much of this increase has occurred in the last 40 years [12]. There is potential for significant impacts, particularly on inshore biota (for example [55]), but the management of land runoff is complex. The problems arise from grazing, cropping and the discharge of nutrient-rich effluent in river catchments that are outside the legislative boundaries of the GBRWHA. However there is increasing acceptance of the problems by all levels of government.

Examples of recent actions addressing the issue:

- *Legislative changes in 1999 have enabled controls to be placed on activities outside the GBRWHA (eg. Regulations to control certain aquaculture activities within a 5 kilometre strip outside the Marine Park [20]).*
 - *End-of-river pollution targets have been developed as part of a major water quality Action Plan [17] to ensure the sustainable future of the GBR.*
 - *Community groups are being encouraged to adopt Integrated Catchment Management processes throughout the GBR catchment.*
 - *The Commonwealth and State Government have entered into an agreement to jointly develop a Water Quality Reef Protection Plan aimed at initiating action to reduce pollutant inputs from catchment activities to the GBRWHA.*
 - *Many agricultural industries are developing their own codes of practice and auditing to address their environmental problems.*
 - *Sewage discharge guidelines have been established for island resorts in the GBRWHA (e.g. through tertiary treatment of effluent for marine outfalls and encouragement of appropriate land disposal).*
 - *Timelines have been established under the State Coastal Management Plan for coastal sewage treatment facilities discharging into coastal waters to upgrade these facilities to remove most nutrients.*
 - *Compulsory pilotage is mandatory for large vessels (over 70m) transiting navigationally hazardous areas within the GBR. GBRMPA continues to monitor shipping activity to identify other navigationally hazardous areas and lobby for their inclusion as compulsory pilotage areas.*
 - *A review of Great Barrier Reef ship safety and pollution prevention measures was undertaken and finalised in June 2002. The report, commissioned by the Commonwealth Government, identifies various strategies designed to improve the safety of vessels (eg compulsory pilotage, mandatory reporting) and alleviate the potential for ship-sourced pollution within the GBRMP.*
 - *The GBRMPA has revised the vessel based sewage provision in the GBRMP Act to prohibit discharge of sewage within 1000m of any reef, island or coastal area. This revision will come into effect in March 2004.*
 - *The GBRMP Act penalty provisions have been amended to provide for significant fines to any person or corporation found guilty of offences in the Marine Park, particularly those related to shipping activities.*
 - *Legislation (GBRMP Act [19] and the EPBC Act [21]) enable strict controls to be applied through permit conditions on any approved coastal developments within or adjacent to the Marine Park.*
- **Fisheries**
Commercial fisheries (bottom trawling for prawns or scallops; line, net, pot or harvest fisheries) and recreational fisheries are important industries for the Queensland [57] and Australian economies. Recreational fishing provides a popular lifestyle opportunity for many visitors to the area. It is recognised, however, that fishing can have significant ecological impacts on target species, non-target species and habitats.

Indigenous fishing also occurs, primarily close to Indigenous communities.

Another major problem for fisheries is latent (or excess) capacity, particularly in the commercial line fishery. The main management issues are to ensure that all fisheries in the GBRWHA are ecologically sustainable and do not compromise world heritage values; to integrate fisheries and ecosystem management, and to develop management strategies that are understood, accepted and complied with by both users and the general community.

Examples of recent actions addressing the issue:

- *The introduction of major reforms in the trawl fishery has seen fishing effort capped and reduced substantially; in the last two years, the number of trawlers in the fishery has been reduced by about 260 (from about 800 to 540) and the area where trawling is permitted has also been reduced by some 96,000 square kilometres (less than 50% of the GBRWHA is currently open to trawling).*
- *The use of By-catch Reduction Devices and Turtle Excluder Devices is now mandatory for all trawlers operating in the GBRWHA.*
- *Vessel monitoring systems (satellite tracking devices) are now mandatory on trawlers and vessels used in some harvest fisheries.*
- *All fisheries will be reviewed over the next 5 years and, when necessary, will be reformed to ensure they are ecologically sustainable; some fisheries management plans which address increasing fishing effort and impacts have already been prepared (eg East Coast Trawl Management Plan) and others are currently being prepared (eg draft Reef Line Mgt Plan).*
- *Enhanced surveillance and enforcement operations over the last few years have resulted in increased detection and prosecution of offences under the GBRMP Act and Regulations. Several Commonwealth and State agencies now cooperate to provide improved intelligence systems and increased air and sea patrols.*
- *Recent research has provided information to assist with managing fisheries in the GBRWHA (for example [58-60]).*
- *Dugong Protection Areas were introduced along the coast in 199 to address the impacts of commercial fishing on dugong [61].*

Tourism and recreational use

Tourism is the largest commercial activity within the GBRWHA. The tourism industry plays an important role presenting the values of the GBRWHA to some 1.6 million tourists who visit the Marine Park each year². Around 90% of the tourism use in the GBRWHA is concentrated in under 10% of the Area: namely the offshore Cairns-Port Douglas area and the Whitsunday area. Approximately 40% of all tourist visitors to the Marine Park are transported by ten major tour operators.

Maintaining the diversity, integrity and productivity of the GBRWHA are all essential for sustainable tourism use, and particular attention is given to:

- protecting coral reefs and other habitats such as seagrass from anchor damage, poor diving practices, waste disposal, reef walking and collecting [62];
- protecting turtles and seabirds [63] from disturbance, particularly during nesting seasons;

² This figure would be higher if it included the number of tourists who also visit resort islands and island national parks within the GBRWHA; however these areas are outside the jurisdiction of the Commonwealth and no detailed figures are available.

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- respecting the cultural importance of the area to Aboriginal and Torres Strait Islander people;
 - minimising conflicts in access within this multiple use Marine Park; and
 - informing visitors about the GBRWHA and its WH values.

There is considerable latent effort in some parts of tourism industry.

Many recreational visitors use privately owned vessels to access the Great Barrier Reef. As at December 2001, there were over 53,000 registered recreational vessels in the coastal region adjacent to the GBR. Relevant recreational activities undertaken in the Marine Park include fishing, boating, swimming and sightseeing.

Examples of recent actions addressing the issue:

- *Statutory Plans of Management (PoMs) for the two most heavily used areas (Cairns-Port Douglas Area and Whitsundays) have led to the application of additional management provisions [36]. These PoMs place limits on the number of vessels and visitors in certain areas, as well as providing a management framework to deal with tourism industry use (e.g. location of moorings and pontoons). A Plan of Management for the Hinchinbrook Area is currently being finalised.*
- *Industry training courses and 'best environmental practices' [62] have been developed in partnership with the marine tourism industry. A Tourism Operators Handbook has been developed which summarises relevant Marine Parks information [50].*
- *A reef-wide policy on bareboats has been adopted and an accreditation system is in place for the bareboat fleet in the Whitsunday Area (one of the largest bareboat fleets in the southern hemisphere), encouraging operators to achieve 'best practice' within this industry.*
- *A reef protection program comprising public moorings and marked 'no-anchoring' areas has been established to protect fringing coral reefs, particularly in the Whitsunday Area. Sixty new public moorings have recently been installed in the Marine Park*
- *A reef-wide mooring policy has been adopted. One hundred and six new moorings have been permitted in the Cairns Area to provide site-specific operators with all year access to the Reef.*
- *Environmental impact assessments for proposed major developments within the Marine Park (e.g. marinas, pontoons, etc.) are undertaken by GBRMPA at a rate of approximately 30 each year. Environmental impacts associated with major developments in the Marine Park are controlled through the use of Impact Monitoring Programs.*
- *A [JD1]reef-wide policy for cruise shipping has been adopted to manage cruise ship access to the GBRWHA, including 14 designated cruise ship anchorages spread throughout the Reef, with a particular focus in the Cairns and Whitsunday Areas.*
- *An expertise-based committee, established specifically to advise the Authority on tourism and recreational matters, has recommended the development of a new framework for better management of tourism and recreational activities in the GBRWHA.*

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- *An audit of the extent of tourism latency in 2000 showed significant latency in all the types of 'capped' permits where limits have been applied, but the Cairns Area and Whitsundays Plans of Management had reduced demand in these two high tourism demand areas;*
 - *Recent research has provided information to assist with managing tourism in the GBRWHA (for example [62-65]).*
 - **Conservation, Biodiversity and World Heritage**

The GBR is under increasing pressure, both from activities within (eg. overfishing and ship-sourced pollution) and adjacent activities (eg. farming, coastal development, land-based pollution). GBR issues related to biodiversity loss include:

- *apparently >90% decline in Dugong numbers (south of Cooktown) since the 1960's [6];*
- *70-90% decline in loggerhead turtles over the last 30 years [5];*
- *trends for pollutant loads are increasing with no current signs of abatement [17], with chronic impacts on marine biodiversity [68]; and*
- *increased severity and frequency of coral bleaching events [69].*

While the Great Barrier Reef is protected as part of the world's largest marine park, different levels of protection are provided and different uses are permitted in the different zones [28]. Currently only 4.5 % of the Marine Park is highly protected - that is, 'no-take' zones [70] that prohibit extractive uses. With today's knowledge, this is considered less than adequate to protect the range of biodiversity now known to exist across the GBRWHA. To ensure better protection of biodiversity, and to more effectively address the pressures on the GBRWHA, GBRMPA has commenced a major program to increase the level and extent of no-take areas (called the Representative Areas Program or RAP [37, 71-72] and aims to protect 'representative' examples of all the different habitats. Protecting adequate examples of all habitats within a network of 'no-take' areas will go a long way towards conserving most, if not all, the species, habitats and ecological processes within the GBRWHA.

Examples of recent actions addressing the issue:

- *A comprehensive map of 70 bioregions [4] provides a scientific and systematic basis for developing the new network of no-take areas and was developed using a range of datasets [73].*
- *More than protecting only the well-known, distinctive or special areas (like coral reefs alone or the "pristine" remote locations), the new zoning approach being developed as part of the Representative Areas Program (RAP) will protect examples of all habitats and communities throughout the GBRWHA [37].*
- *Major efforts are being undertaken in the GBRWHA for the conservation of threatened species, most notably, dugong, turtle and whales/dolphins (for example Dugong Protection Areas [74]; mandatory Turtle Excluder Devices/By-catch Reduction Devices; species recovery plans; seasonal closures, new policies; etc).*
- *A detailed policy on whale and dolphin conservation in the Marine Park was finalised and published in 2000 [75].*
- *Comprehensive reef-wide reviews and compendiums of information about whales and dolphins [7], marine turtles [5] and, in general, fauna and flora of*

the World Heritage Area [76] have been published and are available on the GBRMPA website.

- *Efforts towards effective co-management for traditional hunting eg the Hopevale traditional hunting plan.*

The GBRMPA website [51] outlines many other management actions that have been undertaken to address threats to the values of the GBRWHA. For example, two other important factors affecting the GBRWHA include:

- **Coral Bleaching**

There is increasing consensus among scientists that global warming represents a significant medium-term (30-50 years) threat to coral reefs worldwide. The GBR has not escaped this threat, and has experienced two major bleaching events in the last five years (1998 & 2002). While the effects of these bleaching events have been widespread, the majority of reefs appear to have escaped extensive mortality to date [68]. However, should global warming lead to increased frequency and/or severity of hot water events in the future, coral bleaching is likely to have a more serious impact on the GBR. Global warming is a global-scale threat to coral reefs and little can be done by local management agencies such as the GBRMPA to reduce water temperatures or ameliorate the ultimate cause of the threat. However, at local and regional scales, the GBRMPA is working to minimise additional impacts from human activities.

- **Crown of Thorns Starfish Outbreaks**

The crown-of-thorns starfish (COTS) eats coral and can cause a major disturbance to the ecology of a reef when a population becomes very large - known as an outbreak. The GBR has previously experienced two series of outbreaks of COTS; one from 1962 to 1974 and the other from 1979 to 1991 [12]. A third series of COTS outbreaks began 1993/1994 [77]. This series of outbreaks is still ongoing, but appears to be nearing its end. While the extent of human influence in causing COTS outbreaks remains unresolved, it is important to note that the GBRMPA is addressing the two most commonly suggested causes of outbreaks: over-fishing and nutrient run-off from the land. This is because these are issues of environmental concern regardless of whether or not they play a part in causing COTS outbreaks.

II.6. MONITORING

Current monitoring programs

One of the highest levels of monitoring of any world heritage area takes place on the GBRWHA. This is undertaken primarily through the Cooperative Research Centre for the GBRWHA (Reef CRC) [35] and the Australian Institute of Marine Science (AIMS) [78]. Examples include the Long-term Coral Reef Monitoring Program undertaken by AIMS (79, 80); QDPI Seagrass Watch (81); coral bleaching monitoring [82] and chlorophyll *a* monitoring.

The GBRMPA is working closely with other Commonwealth and Queensland agencies, research institutions and industry groups to develop a coordinated water quality monitoring program across the GBRWHA and its catchment as part of the development of the Water Quality Reef Protection Plan.

II.7. CONCLUSIONS AND RECOMMENDED ACTION

a. Main conclusions regarding the state of the World Heritage values of the property (see items II.2. and II.3. above)

GBRMPA remains cautiously optimistic about the future of the GBRWHA, particularly for the issues for which GBRMPA has direct involvement or control. Where matters are outside the GBRMPA's direct control, GBRMPA takes an active role in negotiating suitable outcomes which support the conservation objectives of the GBRWHA eg. fisheries management and water quality issues. There are some organisms and environmental attributes which require further monitoring or even management actions to address human impacts, but virtually all of these potential problems are currently being addressed by one or more of the management agencies responsible for the care of the World Heritage Area.

There are however, broader issues like coral bleaching or changes in sea level for which little can be done by local management agencies such as the GBRMPA to ameliorate the ultimate cause(s) of the threats.

b. Main conclusions regarding the management and factors affecting the property (see Items II.4 and II.5. above)

Neither management of the Marine Park nor the GBRWHA is static. Use patterns and technology are constantly changing and the marine environment itself is dynamic: subject to both human use and natural impacts. While many of the management tools developed when the park was first declared (zoning plans, permits) are still highly appropriate, management has had to adapt [16] and other management tools have needed to be introduced (eg plans of management [36]; no-anchoring areas, Vessel Monitoring Systems, Dugong Protection Areas [74]).

One area where considerable management efforts still need to occur is a move toward more effective management arrangements which meet the aspirations of Native Title holders and Indigenous people.

c. Proposed future action/actions

d. Responsible implementing agency/agencies

e. Timeframe for implementation

Points (c) - (e) are addressed in the "Framework for Management" [53] and the 2002 progress report [see Attachment 3]

f. Needs for international assistance

While no international assistance is required, there are many other marine protected areas around the world with differing management models and strategies. The Great Barrier Reef Marine Park Authority is therefore continually looking outwards and is willing to work with others to develop the best outcomes for marine area management, both in the GBRWHA but also in other parts of the world.

g. Experience relevant to other State Parties.

While the GBR is not a typical marine protected area or World Heritage Area in terms of its size³ or its complexity, it is considered that the experience gained in the GBR has relevance to many other MPAs and other WHAs. When the GBR Marine Park was first declared in the mid-late 1970s, there were:

- major differences of opinion between the State and Federal governments on both the need for the park and the park boundaries (in fact 28 coastal areas were initially precluded from the GBR Marine Park, and only recently have these been incorporated into the GBR Marine Park [83]);
- little ecological information initially and no relevant management model for managing large marine protected areas;
- interdepartmental conflicts when it came to resource management, especially over fisheries matters; and
- a number of user sectors who completely opposed the marine park concept or the idea of ‘no-take’ zones e.g. commercial fishermen.

It is certainly not necessary to wait until everything is known about an area or that all uncertainties are resolved before declaring and zoning a marine protected area [29]. It is also relevant that long-term political and social support are necessary to achieve effective results in marine conservation.

³ The Great Barrier Reef World Heritage Area is bigger than the United Kingdom, Holland and Switzerland combined.

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- [60] Social Profiles of Queensland's Commercial Fishers - CRC Reef Technical Report No. 36 - <http://www.reef.crc.org.au/research/fish/commercial.html>
- [61] Dugong Protection Areas http://www.gbrmpa.gov.au/corp_site/info_services/publications/dugong/sanctuaries.html
- [62] Best Environmental Practices for popular tourism and recreational activities within GBRWHA. These summaries are designed to complement, rather than duplicate, legal requirements and cover Fish Feeding, Fishing, Whale and Dolphin Watching, Diving and Snorkelling, Visiting Islands, Reef Walking, Turtle Watching, Observing Seabirds, Anchoring and Mooring. http://internal.gbrmpa.gov.au/test/corp_site/key_issues/tourism/best_environmental_practice.html
- [63] Seabird Guidelines - http://www.gbrmpa.gov.au/corp_site/info_services/publications/seabirds/index.html
- [64] Developing Reliable Coral Reef Monitoring Programs For Marine Tourism Operators and Community Volunteers - CRC Reef Technical Report No. 24 <http://www.reef.crc.org.au/publications/techreport/TechRep24.html>
- [65] Towards sustainable management of Dwarf Minke whale tourism industry <http://www.reef.crc.org.au/publications/techreport/TechRep27.shtml>
- [66] Impact of tourist pontoons on fish assemblages in the GBR <http://www.reef.crc.org.au/publications/techreport/TechRep5.shtml>
- [67] Technical report on public perceptions for GBR <http://www.reef.crc.org.au/publications/techreport/TechRep29.shtml>
- [68] A review of water quality issues influencing habitat quality in DPAs http://www.gbrmpa.gov.au/corp_site/info_services/publications/research_publications/rp66/index.html
- [69] GBRMPA coral bleaching website - http://www.gbrmpa.gov.au/corp_site/bleaching/

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- [70] 'Pie-chart' maps showing the current level of 'no-take' areas in each bioregion:
<http://www.gbrmpa.gov.au/corp_site/key_issues/conservation/rep_areas/documents/nonreef.jpg>
or
<http://www.gbrmpa.gov.au/corp_site/key_issues/conservation/rep_areas/documents/reef.jpg>
- [71] The 'Overview document' which outlines some of the background to RAP
<http://www.gbrmpa.gov.au/corp_site/key_issues/conservation/rep_areas/rep_area_overview.html>
- [72] Fifteen technical information sheets provide more detailed information about RAP (eg the biophysical principles developed by the Scientific Steering Committee; an example of the proposed co-ordinate based mapping approach to define zones; Frequently Asked Questions, etc)
<http://www.gbrmpa.gov.au/corp_site/key_issues/conservation/rep_areas/info_sheets.html>
- [73] Some of the datasets/ maps that were used to help develop the bioregions (for example, different types of reef morphology and tidal ranges across the GBR, maps of seagrass, etc) <http://www.gbrmpa.gov.au/corp_site/key_issues/conservation/rep_areas/maps.html>
- [74] Maps of Dugong Protection Areas
<http://www.gbrmpa.gov.au/corp_site/info_services/publications/dugong/large_maps/locality.html>
- [75] Whale & Dolphin Policy document
<http://www.gbrmpa.gov.au/corp_site/info_services/publications/whale_dolphin/whale_dolphin_policy.pdf>
- [76] GBR species - General information
<http://www.gbrmpa.gov.au/corp_site/info_services/publications/misc_pub/fauna_flora/index.html>
- [77] AIMS COTS website -
<<http://www.aims.gov.au/monmap/COTSPage/COTSPage.html>>
- [78] Australian Institute of Marine Science website - <<http://www.aims.gov.au/pages/site-index.html>>
- [79] Long-term monitoring - provides long-term quantitative data on coral reefs in the GBR. Each year, information is gathered on corals, algae, reef fishes from 48 reefs and crown of thorns starfish (COTS) are surveyed on about 100 reefs.
<<http://www.aims.gov.au/pages/research/reef-monitoring/reef-monitoring-index.html>>
- [80] Example of web-based page of a Long-term Monitoring site (John Brewer Reef)
<http://www.aims.gov.au/monmap/reefpages/TO/18075S.html>
- [81] Queensland Department of Primary Industries. Seagrass Watch -
<<http://www.dpi.qld.gov.au/far/9266.html>>
- [82] Long-term sea temperature monitoring program on and adjacent to the GBR -
<http://www.gbrmpa.gov.au/corp_site/info_services/science/seatemp/>
- [83] New coastal areas recently added to the GBR Marine Park
<http://www.gbrmpa.gov.au/corp_site/key_issues/conservation/rep_areas/documents/tech_sheet_09.pdf>