IUCN Conservation Outlook Assessment 2014 **(archived)**
Finalised on 12 November 2014

Please note: this is an archived Conservation Outlook Assessment for Great Barrier Reef. To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

Great Barrier Reef

SITE INFORMATION

Country:
Australia
Inscribed in: 1981
Criteria:
(vii) (viii) (ix) (x)

Site description:
The Great Barrier Reef is a site of remarkable variety and beauty on the north-east coast of Australia. It contains the world's largest collection of coral reefs, with 400 types of coral, 1,500 species of fish and 4,000 types of mollusc. It also holds great scientific interest as the habitat of species such as the dugong ('sea cow') and the large green turtle, which are threatened with extinction. © UNESCO

SUMMARY

2014 Conservation Outlook

Significant concern

The Great Barrier Reef, one of the earliest properties to be inscribed as World Heritage, is a global icon. Unfortunately a number of values in this property are declining, in most part due to human activities over some of which the management authorities have influence (such as fishing and coastal development), and also due to other pressures that cannot be addressed at the site level (such as climate change). While individual decisions and management approaches appear in themselves adequate, the cumulative impacts of many decisions, on top of the legacy impacts and impending impacts of climate change, are of significant concern. A strategic assessment and the resulting sustainable development plan for the property, planned for 2015, should direct conservation action to ensure that the best possible scenarios are in place for the long-term conservation of the property's iconic values. Although its protection and management capacity is cited as being among the best in the world, there is a real concern that many of the values may continue to decline. This could occur in particular if measures to adapt to climate change are not identified and taken, and if certain development decisions remove options for future conservation of the property. Until a clear roadmap on how the property will be managed and concrete indicators of values demonstrating positive trends are in place, the conservation outlook of GBR is at this point in time of Significant Concern.

Current state and trend of VALUES

High Concern
Trend: Deteriorating

The Great Barrier Reef is a very large property containing a large number of World Heritage values. Since inscription of the property in 1981, and despite excellent management and protection, many iconic species (not even taking into account the less iconic species) and habitats have declined. While there have also been positive trends, such as improved water quality, coral proving to be

more resilient than expected and recovering from bleaching events, and the spectacular return of Humpback Whales since hunting pressure on them ceased in 1962, the significant loss of coral cover and associated species which include marine mammals, reptiles, fish, birds and other invertebrates place the conservation outlook for the property as of High Concern.

Overall THREATS

Very High Threat

Climate change, catchment runoff, coastal development, ports, shipping and fishing pose the most important threats to the long-term conservation of the property. Poor water quality is an extremely important threat to the property, influencing in-shore regions of the reef whereas water quality in the mid to outer shelf is good to very good as it is less influenced by river discharge. While it is recognised that it is the inshore reefs which are the most affected due to anthropogenic use, at the same time increase in extreme weather events has caused major damage and decline in WH values of the property since inscription. Despite excellent management and important resources in place to deal with these challenges, the level of threats to the site’s values is very high.

Overall PROTECTION and MANAGEMENT

Mostly Effective

At time of inscription IUCN posed the question as to whether the GBR fulfilled article 2 of the Convention as being a "precisely delineated area", and whether its complicated zoning system and large size meant that it could be effectively managed and protected as a World Heritage site. The answer after over 30 years of inscription is yes, but the enormous size of the property and surrounding developmental pressures means that there will always be protection and management challenges. The management authority (the Great Barrier Reef Marine Park Authority, or GBRMPA) has often been cited as a leader in protected area management and protection, and the EPBC Act used as exemplary legislation for World Heritage. However, there are some strategic issues concerning climate change and sustainable development that must be resolved to ensure long-term conservation. Although the management authority has taken massive and innovative measures in order to protect the property, until the status of values is shown to improve, some concerns remain.

FULL ASSESSMENT

Description of values

Values

World Heritage values

▶ **Superlative natural beauty above and below the water**
Criterion:(vii)

Spectacular scenery including magnificent vistas of green vegetated islands and spectacular sandy beaches spread over azure waters, vast mangrove forests and rugged vegetated mountains with lush rainforest gullies. Below water is the largest network of living coral reefs with spectacular assemblages of hard and soft corals, and thousands of species of reef fish (SoOUV, 2012; Nomination, 1981; IUCN, 1981; Lucas et al., 1997; CoA, 2013a).

▶ **Spectacular species assemblages**
Criterion:(vii)

Spectacular and globally important breeding colonies of seabirds and nesting marine turtles (including the world’s largest Green Turtle breeding area). On some continental islands, periodic occurrence of large aggregations of over-wintering butterflies. Other assemblages include annual coral spawning, migrating whales, and significant spawning aggregations of many fish species (SoOUV, 2012; Nomination, 1981; IUCN, 1981; Lucas et al., 1997; CoA, 2013a).

▶ **Exceptional geological formations and processes linking reefs, coral cays and continental islands.**
Criterion:(viii)

World’s largest coral reef ecosystem demonstrating all stages of reef development. The processes of geological and geomorphological evolution are well represented, linking 600 continental islands with more than 300 coral islands and reefs. The varied seascapes and landscapes have been moulded by changing climates and sea levels, and the erosive power of wind and water, over the past 15,000 years (SoOUV, 2012; Nomination, 1981; IUCN, 1981; Lucas et al., 1997; CoA, 2013a).

► **Outstanding on-going ecological and biological processes in the evolution and development of coastal and marine ecosystems and communities of plants and animals.**
Criterion:(ix)

Biologically the unique diversity of the GBR reflects the maturity of an ecosystem that has evolved over millennia; evidence exists for the evolution of hard corals and other fauna. Globally significant marine faunal groups include over 4,000 species of molluscs, over 1,500 species of fish, plus a great diversity of sponges, anemones, marine worms, crustaceans, and many other groups. Extensive beds of Halimeda algae represent active calcification and accretion over thousands of years (SoOUV, 2012; Nomination, 1981; IUCN, 1981; Lucas et al., 1997; CoA, 2013a).

► **Threatened mammals**
Criterion:(x)

One of the world’s largest populations of Dugong (Dugong dugon, VU, including 15% recorded within Australian waters). Significant refuge for cetaceans with at least 30 species of whales and dolphins, including the Australian Snubfin Dolphin (Orcaella brevirostris, CR) and the Indo-Pacific Humpbacked Dolphin (Sousa chinensis, NT). Regionally important habitat for the Dwarf Minke Whale (Balaenoptera acutorostrata, LC) and an important breeding ground for Humpback Whale (Megaptera novaeangliae, LC). Longman's Beaked Whale (Indopacetus pacificus, DD), possibly the rarest whale in the world, has been recorded here. Most important remaining habitat for the Endangered Proserpine Rock Wallaby (Petrogale persephone) (SoOUV, 2012; Nomination, 1981; IUCN, 1981; Lucas et al., 1997; CoA, 2013a).

► Bird diversity

Criterion:(x)

Some 242 species of birds have been recorded with twenty-two breeding species of seabird on cays and some continental islands; some of these breeding sites are globally significant. Species previously regarded as threatened include Roseate Tern (Sterna dougallii gracilis), Little Tern (Sterna albifrons) and Torresian Imperial-pigeon (Ducula spilorrhoa), although they are now classified as Least Concern. Beach Thick-knee (Esacus giganteus) is considered to be Near Threatened (SoOUV, 2012; Nomination, 1981; IUCN, 1981; Lucas et al., 1997; CoA, 2013a; IUCN, 2013).

► Threatened reptiles

Criterion:(x)

With six of the world's seven species of marine turtle, the property provides globally important nesting and feeding grounds for the Loggerhead (Caretta caretta, EN); Green (Chelonia mydas, EN); Hawksbill (Eretmochelys imbricata, CR) and Flatback (Natator depressus, DD) including one of the last significant breeding populations of the Hawksbill Turtle in the world, the largest Green Turtle breeding population in the world and 70% of the South Pacific population of the Loggerhead Turtle. 14 species of sea snakes breed in the property (SoOUV, 2012; Nomination, 1981; IUCN, 1981; Lucas et al., 1997; CoA, 2013a; GBRMP, 2012).

► Outstanding diversity of fish including threatened species

Criterion:(x)

Over 1600 species of fish in more than 130 families with the number of reef-associated fish alone being 1,468. 134 species of sharks, rays and skates, many of which are threatened (SoOUV, 2012; Nomination, 1981; IUCN, 1981; Lucas et al., 1997; CoA, 2013a; GBRMPA, 2009).

► Outstanding diversity of invertebrate species, including hard and soft corals

Criterion:(x)

As the world's most complex expanse of coral reefs, there are more than 500

species of corals in 60 genera including hard corals, soft corals, sea pens and sea fans. Ecologically important inter-reefal areas include at least 330 species of ascidians, between 300 and 500 species of bryozoans, 800 species of echinoderms, at least 5,000 species of molluscs, 1,500 species of sponges and a high diversity in flatworms, crustaceans and polychaetes, as well as butterflies (SoOUV, 2012; Nomination, 1981; IUCN, 1981; Lucas et al., 1997; GBRMPA, 2009; CoA, 2013a).

▶ **Outstanding diversity of plants including mangroves and seagrass**
Criterion:(x)

The continental islands support thousands of plant species, while the coral cays also have their own distinct flora including threatened species. The shallower marine areas support 37 species of mangroves (54% of the world diversity) and 15 seagrass species covering over 6,000 km2. There is also a high diversity of macroalgae and benthic microalgae (SoOUV, 2012; Nomination, 1981; IUCN, 1981; Lucas et al., 1997; GBRMPA, 2009; CoA, 2013a).

Assessment information

Threats

Current Threats
High Threat

Climate change, catchment runoff, coastal development, ports, shipping and fishing pose the most important threats to the long-term conservation of the property. Poor water quality is an extremely important threat to the property, influencing in-shore regions of the reef whereas water quality in the mid to outer shelf is good to very good as it is less influenced by river discharge. While it is recognised that it is the inshore reefs which are the most affected due to anthropogenic use and that the overall condition of the reef in more northern and deeper water is less threatened, and that good management instruments are in place, at the same time increase in extreme weather events

has caused major damage to the property since inscription, the extent of which has not been seen historically.

▶ Chemical changes in oceanic waters

Very High Threat
Inside site
Outside site

Ocean warming and acidification of water cause decline in coral (coral bleaching, reduced growth rates and/or skeletal density) and other habitats (changes in rainfall patterns and increased likelihood of flooding affecting seagrass, mangroves). Increased storms and intensity of storms, possibly due to climate change, cause increased sediment, nutrient and pesticide run-off from land. (Johnson & Marshall, 2007; ANU, 2009; De'ath et al., 2009; GBRMPA, 2007, 2009; IUCN & WHC, 2012).

▶ Commercial/ Industrial Areas

Very High Threat
Inside site
Outside site

Extension of existing ports, proposals for port development in pristine areas, dredging, disposal of dredging spoil and shipping. Loss and degradation of critical habitat of the marine megafauna; fragmentation of dugong, turtle and dolphin populations through habitat loss and degradation reducing their resilience to other anthropogenic impacts and the impact of extreme weather events, such as floods and cyclones. Lighting and noise impacts on species such as turtles. The rate of development of the property has been characterised as "death by a thousand cuts". The cumulative and combined effect of this development and the absence of strategic vision jeopardize the natural beauty and integrity of the property (GBRMPA, 2009; IUCN & WHC, 2012; Senate Hearing, 2013; Grech et al., 2013).

▶ Tourism/ Recreation Areas

Low Threat
Inside site
Outside site

It is estimated that there are over 14 million recreational visits to the Marine Park by GBR catchment residents every year, plus visits by independent

travellers from outside the catchment. The “Recreation Management Strategy” provides an overarching framework for sustainably managing recreation (CoA, 2013b). In 2003 CRC estimated approximately 1.6 million visitors on commercial tourism operations per year with more than one million visitor nights per year spent on island resorts (CRC, 2003). In 2008, a total of 1,895,428 tourism visits were made to the Great Barrier Reef Marine Park of which 1,374,008 were full day visits and 521,420 were half day visits or visitors who did not pay the Environmental Management Charge. In the same year, an additional almost 3,000,000 people were transported by the tourism fleet to visit island destinations throughout the Region. (GBRMPA, 2009).

► Shipping Lanes

High Threat
Inside site
Outside site

Ship strikes on already depleted populations of long-lived, slow-breeding species including dolphins, whales, dugongs and sea turtles. Significant noise. Lighting from ships disorients turtles. Antifouling paint from international ships (TBT causes hormonal change in gastropods etc). Risk of oil and chemical spills (e.g. the Chinese ship Shen Neng 1 grounded on the reef in 2010 but fortunately only caused minor damage). Shipping may also introduce invasive species from ballast water and there are problems of waste disposal and anchor damage. Further successful management actions include the regulation of shipping and marine safety as implemented through the Australian Marine Safety Authority (GBRMPA, 2009; IUCN & WHC, 2012; Senate Hearing, 2013).

► Hyper-Abundant Species

High Threat
Inside site
Outside site

Crown-of-thorns starfish (COTS) outbreaks linked to water quality, and cyanobacteria (GBRMPA, 2009). Measures to address the threat of starfish in high value areas are being undertaken.

► Water Pollution

Very High Threat
Inside site
Outside site

Sediment, nutrient and pesticide run-off from coastal rivers and storm damage (GBRMPA, 2009; IUCN & WHC, 2012). Significant decline in coral cover, particularly of in-shore reefs south of Cooktown. Over the past 5 years water quality has improved from catchment run-off through an ambitious Reef Water Quality Protection Plan (Reef Plan) (IUCN & WHC, 2012; Reef Plan, 2011, 2013), although the rate of improvement has been slower than targeted (Australian Government and Queensland Government, 2014).

► Fishing / Harvesting Aquatic Resources

High Threat
Inside site
Outside site

Concerted action has led to a successful sustainable management of most forms of commercial fisheries. Significant management improvements include the 2003 rezoning of the Great Barrier Reef Marine Park (GBRMPA, 2004) which led to an increase of no-take zones up to 33% of the property, the introduction of 16 dugong protection areas along the coast, and a refining of size and bag limits of important fish and crab species. New spatial and temporal closures have been introduced along the coast to safeguard important nursery areas for fish and prawn stocks. The overall compliance and surveillance of the no-take zone is highly sophisticated, although recreational fishing may have some impacts (GBRMPA, 2009; IUCN & WHC, 2012). According to the 2014 Great Barrier Reef Outlook Report (GBRMPA, 2014), illegal fishing is still a very high risk to the property, and cumulative impacts of fishing are not well understood.

Potential Threats

Very High Threat

Further port infrastructure development and increased port activity and shipping within and around the property could have a major effect. However, if climate change causes major changes to the system, all threats to the property

will be even greater than they are today.

▶ Temperature changes

Very High Threat
Inside site
Outside site

Sea level rise will affect nesting (some birds and turtles) and mangrove reproduction. Mortality of seabirds, turtles and other species may increase due to provisioning failure that is consequent on changes to circulation patterns (Johnson & Marshall, 2007; ANU, 2009). Rising sea temperatures will stress coral reefs, increasing bleaching severity. Severe weather events, such as cyclones will also increase. If worst-case climate change scenarios occur, the OUV of the property will be severely affected despite research indicating that well-protected areas offer greater resilience and capacity to rebuild compared to reefs without their full complement of fish (Hughs et al., 2007; Diaz-Pulido et al. 2009).

▶ Commercial/ Industrial Areas

Very High Threat
Inside site
Outside site

The abundant availability of coal and gas in the State of Queensland and the rapidly growing international
demand for this resource is the primary driver for the development of port infrastructure along the coast of the Great Barrier Reef. The current four major export ports (Townsville, Abbott Point, Hay Point/Mackay and Gladstone Port) have a total export capacity of 256 million tonnes (IUCN&WHC, 2012). Increased port development will cause a further loss of wetlands along the Great Barrier Reef coast (14% of freshwater wetlands have already been lost in the GBR (GBRMPA, 2014). Proposed port developments would involve very high sediment load in the water through dredging operations. Plans will also almost double shipping through the reserve, with the concomitant risk of species collisions, increased risk of invasive species, and additional disturbance. Port proposals in the pristine and largely undeveloped areas of Fitzroy Delta are understood to have lapsed, but remain a concern in Cape York.

Protection and management

Assessing Protection and Management

► Integration into regional and national planning systems

Some Concern

The Great Barrier Reef Marine Park Authority (GBRMPA) is the statutory Australian management authority for the Park, and works with the Queensland Government and a range of other government agencies in cooperative partnership (GBRMPA, 2011). In general terms, the actual Marine Park falls under Australian Government jurisdiction, and the adjacent catchments are within the jurisdiction of the Queensland State Government. These differences lead to issues when adopting an ecosystem-based approach to management, and in particular, in addressing land-based impacts (Brodie & Waterhouse, 2012).

► Relationships with local people

Mostly Effective

Over one million people live in or around the Great Barrier Reef (CoA, 2013a). There is a high degree of commitment to the protection of the property among all stakeholders involved, including Commonwealth, State and local authorities, traditional owners, representatives from NGO’s, private sector and the wider community (IUCN & WHC, 2012). The GBRMPA reported on working with more than 30 Traditional Owner groups, administering an AU$500,000 grants program on Traditional Use of Marine Resources Agreements to gain greater compliance with laws concerning illegal use of nets to take turtle and dugong, and empowering the community (GBRMPA, 2011).

► Sustainable finance

Highly Effective

The Queensland and Australian governments provide very significant investment in the property. Over AU$375m were spent over five years on Reef Plan activities including AU$200m for the Australian Government’s

Caring for our Country Reef Rescue initiative to reduce the discharge of sediments, nutrients and pesticides from agricultural lands to the GBR lagoon and AU$175my for Reef Plan activities (CoA, 2013b). The management authority (the GBRMPA) has received more than AU$200m over the last five years (reporting AU$46.5m total revenue for 2010-11, GBRMPA, 2011). This funding included AU$2.13m for a new initiative to control Crown-of-thorn Starfish. In addition funding has been earmarked for AU$12.5m over four years from 2013 to the Great Barrier Reef Foundation to coordinate research in areas such as reef resilience and climate change; AU$2.8m for projects to inform the comprehensive strategic assessment and long-term sustainable development planning for the GBRWHA and adjacent coastal zone; AU$12.4m over four years for reef ecosystem research through the National Environmental Research Program (NERP); more than AU$11.25m for 14 projects in catchments that flow into the GBR lagoon for activities which restore, manage and better protect biodiversity; and AU$3.68m over four years through the NERP’s Tropical Ecosystems Hub for water quality research aimed at better understanding the drivers and impacts of water quality on the biodiversity of the GBR. In addition, the Queensland Government has provided an undertaking to maintain the level of funding applied to the Reef Water Quality initiatives ($35 million per year); AU$2m to improve extension in the reef catchments to better educate farmers about improved land management practices; over AU$8m a year for joint field management for the Marine Park which includes compliance, management of visitor facilities and education; over AU$21mn a year for fisheries management, and an additional AU$9 m towards a buy-out of netting licences on the east coast of Queensland which will have profitability benefits for the fishery, as well as conservation benefits (CoA, 2013b).

► Staff training and development

Highly Effective

GBRMPA has an International Engagement Strategy: in 2010-11 it hosted 15 visits during the year comprising a total of 143 officials from 13 countries for discussions on the full range of topics concerning management of the Great Barrier Reef. GBRMPA staff had the opportunity of exchanging ideas and lessons learned with the international visitors. In addition, 11 GBRMPA staff undertook assignments overseas, visiting 12 countries. These visits included targeted international conferences, a meeting of the International Coral Reef

Initiative, and workshops and seminars (80% funded externally, and staff were engaged as key trainers). AU$162,570 spent on staff learning, development and study assistance in 2010-11 (GBRMPA, 2011).

► Education and interpretation programs

Highly Effective

Over 60,000 students from 270 schools across Queensland are now part of the Reef Guardian Schools program (GBRMPA, 2011). Community education was successfully delivered through the Reef HQ Aquarium, the national education centre for the GBR, which is important for raising awareness of the Great Barrier Reef's value, its threats, and everyone's role in protecting the property. More than 120,000 people from around Australia and the world visited Reef HQ in person and another 5800 students experienced the Reef in a virtual way through video conferencing. More than 23,000 visitors toured Reef HQ's Turtle Hospital, which cares for sick and injured turtles (GBRMPA, 2011). The GBRMPA website attracts more than 50,000 visits per month and is key to communication (GBRMPA, 2011). The Queensland Government has committed AU$2 million to better educate farmers about improved land management practices (CoA, 2013). The highly successful Reef Guardian Stewardship program received funding to strengthen its schools and councils programs and investigate opportunities for the farming and fishing industries in the Great Barrier Reef catchment. The Reef Guardian Farmers program was launched in March 2011, with a sugar cane farmers pilot program. The programme showcases the good land practices that Reef Guardian Farmers are undertaking that help to improve the health of the Great Barrier Reef. It aims to encourage other farmers to follow their lead. The Reef Guardian Fishers pilot programme involving the Reef Line commercial fishing sector was launched in 2011, with six reef line fishers. They are participating in a range of voluntary activities that support the Great Barrier Reef. Marine Aquarium Fish and Coral Collection Fisheries also joined the Reef Guardian pilot programme. The Great Barrier Reef Marine Park Authority's Reef Guardian Program demonstrates that a hands-on community-based approach to caring for the Great Barrier Reef is essential to help preserve its immense social, economic and environmental value (GBRMP, 2011).

► Management effectiveness

Mostly Effective

Although there has been declining trends in some values of the property, there have also been positive trends, particularly in reversing historical declines. For example there is an increase in Humpback Whales and an improvement in water quality (IUCN & WHC, 2012; CoA, 2013b; Reef Plan, 2013). However, while it can still be credibly claimed that the GBR is the best managed coral reef system in the world, this is a relative assessment against other reef systems and management regimes and not an absolute claim for effective management (Brodie & Waterhouse, 2012).

► Management system

Highly Effective

The Great Barrier Reef Marine Park Authority (GBRMPA) is the management authority for the Park, which covers some 99% of the World Heritage site. It works in partnership with the Queensland Parks and Wildlife Service, to deliver an effective Field Management programme; ensuring users of the Reef comply with the Zoning Plan (GBRMPA, 2011). The management system includes a multi-use zoning plan and numerous strategies for biodiversity conservation, tourism, invasive species management, water quality, etc. Currently Queensland and Australian Governments are implementing the Great Barrier Reef Water Quality Protection Plan which is delivering on-going improvements in catchment management which have reduced the impacts of run-off on the GBR; undertaking research and management activities to combat Crown-of-thorns Starfish; implementing a comprehensive zoning; established the new Coral Sea Commonwealth Marine Reserve, which forms an important contiguous marine protected area adjoining the seaward boundary of the GBRWHA. There is an on-going commitment to continuing efforts to ensure the quality of water entering the reef from adjacent catchments has no detrimental effect on the health and resilience of the GBR (CoA, 2013b). However, what is needed is a significant reduction in sediment loads to the Reef’s environments.

► Tourism and interpretation

Highly Effective

“High Standard Tourism Program” exists where operators work to protect and present the reef. Operators must be independently assessed under Ecotourism Australia’s ECO Certification Program as operating at the two

highest levels of the Program: Ecotourism and Advanced Ecotourism to be recognised as high standard by the GBRMPA. In 2012, there are 58 high standard reef tourism operators, which carry over 60 per cent of all tourists who visit the GBR. The GBRMPA has developed factsheets to assist tourism operators to reduce their emissions and adapt to climate change. The factsheets contain case studies outlining how some tourism operators have reduced their emissions (CoA, 2013b).

► Monitoring

Highly Effective

Good monitoring based on a strong research and science base. This includes the Long Term Monitoring Program (LTMP) assessing GBR coral status since 1985 by the Australian Institute of Marine Science (AIMS); the GBR wide long-term chlorophyll
monitoring program run from 1991 by the GBRMPA and AIMS; the Reef Plan/Reef Rescue Marine Monitoring Program assessing water quality and ecosystem health since 2005; aerial survey monitoring of dugong populations led by James Cook University; seagrass monitoring led by Queensland Department of Primary Industries (DPI) (from the 1970s onwards) and Seagrass Watch; and for fish, the Fisheries Long Term Monitoring Program (commencing in 1999 and the Fisheries Observer Program (see Brodie & Waterhouse for references to these monitoring programmes). Some concerns regarding adequate funding for on-going Reef Plan (GBRMPA, 2009; IUCN & WHC, 2012).

► Research

Highly Effective

Strong research and science base, the result of a large and long-term investment of efforts, and the involvement of many scientists and institutions (IUCN & WHC, 2012).

► Implementation of Committee decisions and recommendations

Serious Concern

Decision 37 COM 7B.10 noted with concern the limited progress made by the State Party in implementing key requests made by the Committee (Decision 36 COM 7B.8), saying that they have not yet or only partially been

implemented. The most recent Committee Decision (38COM 7B.63) welcomed the progress made by the State Party with the Strategic Assessment, as well as progress achieved with regard to water quality. The 39th session of the World Heritage Committee in 2015 will be a crucial moment where the Committee will examine progress made by Australia in the implementation of its requests.

► Sustainable use

Mostly Effective

A strategic assessment for the property was completed in August 2014 with the subsequent Long-Term Sustainability Plan expected to be completed in 2015.

► Boundaries

Highly Effective

Boundaries mostly match the Great Barrier Reef Marine Park. The property is managed through a comprehensive multiple-use zoning system (GBRMPA, 2004) which is matched by complementary Queensland legislation in the adjoining State land and waters that provides protection for the range of biodiversity, while allowing a variety of other sustainable uses to occur. The new Coral Sea Commonwealth Marine Reserve, which covers 989,842 km2 and abuts the entire eastern edge of the GBRWHA, adds substantial additional protection for the integrity of the property (CoA, 2013b). However, it has been noted that the Marine Park comprises 99.25 percent of the WHA. Parts of the WHA not included in the Marine Park comprise: islands under State (Queensland) jurisdiction (most of these are national parks); State waters and internal waters of Queensland (e.g. deep bays or narrow inlets, many of which are State Marine Parks); and a number of small exclusion areas around major ports/ urban centres (e.g. Cairns). These boundary differences result in jurisdictional complexities, and in many cases, have resulted in challenges in the management of GBR coastal freshwater ecosystems, estuaries and port exclusion areas. While the Australian Government’s Environment Protection and Biodiversity Conservation Act 1999 provides the framework to protect and manage Australia’s WHAs, and State legislation also exists to manage locations that fall within the WHA but not the Marine Park, there has been a lack of integration of research,

management and monitoring activities in these areas. Environmental issues associated with port development on the GBR coast provide have been cited as an example of the inadequacies of the current management regime across jurisdictions (Brodie & Waterhouse, 2012).

▶ Legal framework and enforcement

Mostly Effective

The Environment Protection and Biodiversity Conservation (EPBC) Act 1999 is a model for World Heritage legal framework, and other laws (the Great Barrier Reef Marine Park Act 1975 and various Queensland (state) laws) provide additional legal protection (CoA, 2013b).

Overall assessment of protection and management

Mostly Effective

At time of inscription IUCN posed the question as to whether the GBR fulfilled article 2 of the Convention as being a "precisely delineated area", and whether its complicated zoning system and large size meant that it could be effectively managed and protected as a World Heritage site. The answer after over 30 years of inscription is yes, but the enormous size of the property and surrounding developmental pressures means that there will always be protection and management challenges. The management authority (the Great Barrier Reef Marine Park Authority, or GBRMPA) has often been cited as a leader in protected area management and protection, and the EPBC Act used as exemplary legislation for World Heritage. However, there are some strategic issues concerning climate change and sustainable development that must be resolved to ensure long-term conservation. Although the management authority has taken massive and innovative measures in order to protect the property, until the status of values is shown to improve, some concerns remain.

▶ Assessment of the effectiveness of protection and management in addressing threats outside the site

Some Concern

Legally through the EPBC Act any threats to the property from outside the site require assessment and authorisation. However, some differences of opinion over the impact of some economic activities, and how they will affect

the Outstanding Universal Value of the property, have led to community concerns.

► **Best practice examples**

Numerous. The zoning plan (GBRMPA, 2004) has been widely cited as an important management and protection tool. The EPBC Act for World Heritage is also a model piece of legislation. Communication, community training, ecotourism certification and outreach programmes (Reef Guardians, etc.) are also best practice.

State and trend of values

Assessing the current state and trend of values

World Heritage values

► **Superlative natural beauty above and below the water**

High Concern
Trend:Deteriorating

Coral cover, a primary indicator of reef status, is declining. This is due to a number of interrelated stressors, including terrestrial run-off of sediments and nutrients and associated COTS outbreaks, coral bleaching and water acidification associated with climate change, and coral diseases (Brodie & Waterhouse, 2012). While the level of coral loss is still debated, it is generally recognised that coral cover has declined from levels near 28% in 1986 to less than 14% currently (GBRMPA, 2009; Hughes et al., 2011, Sweatman et al. 2011a, 2011b), while elsewhere it is said that “long-term monitoring and assessment over more than 27 years indicates there has been a decline in coral cover of ~50 per cent, substantially due to declining water quality and subsequent increased frequency of crown-of-thorns starfish outbreaks (GBRMPA, 2012b; Rolf et al., 2012; De’ath et al., 2012). However, the 2009 Outlook Report states that the overall status of coral reefs on the Great Barrier Reef is relatively good, but is likely to be declining slightly, especially in inshore areas. However, the picture is not simple or clear cut, with reefs in different regions showing enormous differences in trends, including both

increases and declines (GBRMPA, 2009).

▶ Spectacular species assemblages

High Concern
Trend:Deteriorating

In addition to coral cover (see above) there is decline of species associated with the reef, and some evidence of seabird decline (GBRMPA, 2009). However, there has been no record of loss of some spectacular species assemblages (seabirds, butterflies, fish) although major loss of coral can be considered as a spectacular species assemblage.

▶ Exceptional geological formations and processes linking reefs, coral cays and continental islands.

High Concern
Trend:Deteriorating

Increasing coastal development is resulting in the loss of both coastal habitats that support the Great Barrier Reef and connectivity between habitats (GBRMPA, 2009).

▶ Outstanding on-going ecological and biological processes in the evolution and development of coastal and marine ecosystems and communities of plants and animals.

High Concern
Trend:Deteriorating

As above. Note that there are many parts of the property, mainly at mid to outer-shelf, which have good to very good water quality (Reef Report, 2011) so trends in biological processes vary depending on which areas of the property are studied.

▶ Threatened mammals

High Concern
Trend:Stable

Evidence for serious dugong decline from 1962 to 1999 (Marsh et al., 2005) triggered significant conservation initiatives. Possible causes of mortality include incidental netting in fish nets and shark nets, loss of seagrass habitat due to water quality impacts and coastal development and hunting (Marsh et

al., 2007). The combination of severe weather events in 2011 has also increased dugong mortality with evidence suggesting that large numbers of animals moved to the northern GBR as a result of the seagrass loss. (IUCN & WHC, 2012) The long term effects of this in combination with the existing threats has yet to be assessed (Brodie & Waterhouse, 2012).
Some good news is that the population of 'east Australian' Humpback Whales (which went as low as 500 animals when whaling in the 1950's and 1960's ceased) has increased to an estimated population of more than 10,000 animals in 2008 Noad et al., 2008), and about 14,000 animals in 2010 (Noad et al., 2010), about half of the estimated pre-whaling population size (Brodie & Waterhouse, 2012). Populations of two inshore marine mammals, the endemic Australian Snubfin Dolphin and the Indo-Pacific Humpback Dolphin are at risk, especially from interactions with large mesh fishing nets and increasing human use of their inshore habitat. There is limited information for any other dolphin species in the Great Barrier Reef (GBRMPA, 2009). Snubfin Dolphins appear to be in serious threat due to the recent coastal industrial boom (IUCN & WHC, 2012; Cagnazzi, 2013). The status of the Proserpine Rock Wallaby is not discussed in the GBR Outlook Report (GBRMPA, 2009).

► Bird diversity

Critical
Trend:Deteriorating

The 2009 Outlook Report notes some significant declines in ecologically important species such as seabirds. Litter transported to the ocean by urban runoff may be ingested by seabirds or cause entanglement (GBRMPA, 2009). The overall status assessment of the 20 seabird species known to breed in GBR (at inscription the figure was 22) remains poor due to the cumulative impacts of climate variability in combination with increased pressure on resilience from commercial and recreational fishing; direct disturbance by visitors to islands; activities on the mainland coastline; breeding habitat destruction and the introduction of exotic plants and animals to breeding habitats; and pollution and water quality degradation with associated trophic disturbance (IUCN & WHC, 2012).

► Threatened reptiles

Critical
Trend:Deteriorating

The 2009 Outlook Report notes some significant declines in ecologically important species such as marine turtles. Litter transported to the ocean by urban runoff may be ingested by marine turtles or cause entanglement (GBRMPA, 2009). Research indicates that Green Turtle populations may be at the beginning of a decline, including declining annual average size of breeding females, increasing re-migration interval and declining proportion of older adult turtles to the population (Limpus et al., 2003; Brodie & Waterhouse, 2012). There are concerns for the northern Green Turtle breeding stock include poor nesting success at Raine Island, while southern Green Turtle stock that as in good condition prior to 2011 then had record mortality presumably associated with seagrass loss (IUCN & WHC, 2012; Brodie & Waterhouse, 2012). A marine turtle recovery plan identifies the many threats and management measures needed (EA, 2003). Serious declines in Loggerhead Turtle were noted by Brodie and Waterhouse (2012) although the 2009 Outlook Report recorded improvement thanks to fishing turtle excluder devices (GBRMPA, 2009; IUCN & WHC, 2012). No Leatherback Turtle nests recorded in Queensland since 1996 although Flatback Turtles show no sign of decline (Brodie & Waterhouse, 2012). Unknown if sea snakes are declining in the property although noted that they are taken as bycatch, although excluding devices show potential (GBRMPA, 2009, 2012b). The 2009 Outlook Report adds that Estuarine Crocodile numbers are recovering (GBRMPA, 2009).

► Outstanding diversity of fish including threatened species

Critical
Trend:Deteriorating

The 2009 Outlook Report (GBRMPA, 2009) notes some significant declines in ecologically important species such as some of the 134 shark and ray species. It adds that of the more than 1600 bony fish species, only a few are known to have locally depleted populations. They add that reports and assessments have indicated that populations of some fish species are under pressure including Grey Mackerel, Garfish and Snapper (GBRMPA, 2009). It is possible the Speartooth Shark has become extinct from waterways on the east coast of Australia (IUCN & WHC, 2012). There are significant range contractions and population declines for Freshwater and Green Sawfish from the southern and central section of the Great Barrier Reef north to at least

Cooktown (IUCN & WHC, 2012; GBRMPA, 2012c).

► Outstanding diversity of invertebrate species, including hard and soft corals

High Concern
Trend:Deteriorating

See above for decline in coral cover. The 2009 Outlook Report (GBRMPA, 2009) notes some significant declines in ecologically important species such as Black Teatfish (a sea cucumber, also known as bêche-de-mer) which is of economic importance. The Black Teatfish fishery is the only commercial fishery to be closed in the Marine Park; many species of holothurians are data-deficient and understanding of their ecological role is lacking (GBRMPA, 2012a).

► Outstanding diversity of plants including mangroves and seagrass

Low Concern
Trend:Stable

Only seagrass, mangroves and algae were considered in the 2009 Outlook report with no information provided on terrestrial plants in the property. While no robust trends in seagrass health and abundance are available, it is suggested that seagrass is declining in parts of the GBR, particularly in the Townsville region (Brodie & Waterhouse, 2012) although other reports say seagrass beds have been stable over the last 20 years (GBRMPA, 2009). Mangroves are considered to be in excellent condition but subject to localised (and potentially increasing) losses from port and urban development (GBRMPA, 2009; Brodie & Waterhouse, 2012).

Summary of the Values

► Assessment of the current state and trend of World Heritage values

High Concern

Trend: Deteriorating

The Great Barrier Reef is a very large property containing a large number of World Heritage values. Since inscription of the property in 1981, and despite excellent management and protection, many iconic species (not even taking

into account the less iconic species) and habitats have declined. While there have also been positive trends, such as improved water quality, coral proving to be more resilient than expected and recovering from bleaching events, and the spectacular return of Humpback Whales since hunting pressure on them ceased in 1962, the significant loss of coral cover and associated species which include marine mammals, reptiles, fish, birds and other invertebrates place the conservation outlook for the property as of High Concern.

Additional information

Key conservation issues

▶ **Pollution from catchment runoff**

Local

The GBR contains extensive areas of coral reef, seagrass meadows and estuarine ecosystems and is an important commercial and recreational fishery. Adjacent catchments discharge pollutants from agricultural, urban, mining and industrial activity. Pollutants include suspended sediment from erosion in cattle grazing, nitrate from crop fertilizers, and herbicides from various land uses. The fate and effects of these pollutants are relatively well understood, though new pollutants and ecosystem disturbances with poorly understood effects (e.g. hormones and commercial chemicals) may be emerging from urban areas and new industrial ports. Estuarine ecosystems of significance to Reef health are also under pressure from development, die-back and hydrological change.

▶ **Climate change**

Global

Ocean water warming leading to coral bleaching and recent intense cyclones and floods have been attributed to climate change. Both adaptation and mitigation strategies are needed.

▶ **Population increase/coastal development**

Local

Currently about a million people live in or around the property, but these figures will increase, increasing developmental pressure as people need jobs and will also increasingly use the property for recreation.

▶ **Tourism**

Local

Tourism has high impact on the property requiring careful management.

▶ **Hyper-abundant species and invasive species**

Regional

Outbreaks of the Crown-of-thorns Starfish are linked to nutrients in the water, and have increased with anthropogenic change. Invasive species on the many islands inside the property have not been reported on in the conservation outlook reports and should be. Species such as rats, cats and mice are known to have direct, negative impacts on seabird and turtle populations.

Benefits

Understanding Benefits

▶ **Outdoor recreation and tourism**

Tourism attraction generates between AU$5-6bn of economic expenditure annually (2013 senate hearing) Tourism visitors generate an annual contribution of AU$5bn to the GDB of the country and result in employment of over 54,000 jobs that is not matched by any other sector (IUCN & WHC, 2012).

▶ **Is the protected area valued for its nature conservation?**

Conservation of unique biodiversity and geodiversity

▶ **Does management of the site provide jobs (e.g. for managers or rangers)?**

Jobs in park management, species recovery and monitoring, fishing and

tourism.

▶ **Importance for research, Contribution to education**

Great deal of research and education in the property which also creates jobs

▶ **Sacred natural sites or landscapes**

Iconic seascapes

▶ **Fishing areas and conservation of fish stocks**

Recreational and commercial fishing regulated but permitted.

Summary of benefits

Due to the large size of the property and the fact that it has been inscribed for all four natural criteria means that the property provides a wide array of benefits to people living both within and outside the site. In addition to nature conservation and conserving cultural and wilderness values, the property provides a wide range of ecosystem services, furnishes a wealth of scientific knowledge and provides jobs either through park management, tourism, research and education. Sustainable use provisions allows the local population to benefit from traditional, recreational and commercial fishing and hunting (traditional owners are allowed to sustainably hunt dugong).

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
1	GBRMPA, James Cooke University		Removal of Crown-of-thorns Starfish and research into management of this invasive species.
2	NERP		National Environmental Research Program (NERP) Tropical Ecosystems Hub. Started 2011.

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