

## Overview:

### The current status of the Great Barrier Reef: Feb 2006

The Great Barrier Reef is under mounting pressure. For example:

- since the European settlement of Australia, the annual flow of nutrients and sediments from the land into the Great Barrier Reef has increased approximately four times;
- since 1998, the Great Barrier Reef has suffered its two worst ever recorded coral bleaching events, caused by unusually hot sea water;
- the commercial harvest of sharks and rays has increased fourfold since 1993;
- over the last 40 years, numbers of nesting loggerhead turtles have declined by between 50% and 80%; and
- estimates of dugong populations adjacent to the urban coast of Queensland indicate that they are currently only about 3% of what they were in the early 1960s.

Similar pressures elsewhere in the world have contributed to the loss of up to 20% of the world's coral reefs, with a further 24% of the world's coral reefs under imminent risk of collapse<sup>1</sup>.

Despite these pressures, the Great Barrier Reef is still a wonderful natural asset for Australia and the world. Many areas are still in very good condition but there is no room for complacency on the part of managers or the community. Given the increasing pressures on the Great Barrier Reef, active protection is required to ensure that the Great Barrier Reef remains an intact and functional ecosystem, and that human use of the Reef is sustainable now and for the future.



While many areas of the Great Barrier Reef are in good condition, mounting pressures on the Reef leave no room for complacency.

### In recent years the Australian Government, through the Great Barrier Reef Marine Park Authority (GBRMPA), has:

- rezoned the entire Great Barrier Reef Marine Park to better protect the Reef's biodiversity, and to maintain the biological connections and ecological processes that sustain the Great Barrier Reef ecosystem. The new Zoning Plan came into effect on 1 July 2004 and increased the total percentage of highly protected ('no-take') areas from 4.6% to 33.3% of the Great Barrier Reef Marine Park;
- continued to work with the Queensland Government to introduce legislation requiring the mandatory use of functional 'Turtle Excluder Devices' and 'Bycatch Reduction Devices' to reduce the incidental take of bycatch<sup>2</sup> species (including

<sup>1</sup> See Wilkinson, C. 2004, *Status of coral reefs of the world*, Vol. 1 and 2, Australian Institute of Marine Science, Townsville. <http://www.aims.gov.au/pages/research/coral-bleaching/scr2004/index.html>

<sup>2</sup> The accidental or incidental catch of species that are not targeted by fishermen.



turtles), and to assist in the modification of these devices to improve their performance;

- worked with the Queensland Government to achieve the implementation of [Dugong Protection Areas](#) to reduce the impacts of fishing nets on dugongs;
- negotiated improved management arrangements for the East Coast Trawl Fishery, the Coral Reef Finfish Fishery and the Tropical Rock Lobster Fishery;
- worked closely with the Queensland Government to develop the [Reef Water Quality Protection Plan](#) (the Reef Plan), which was released in December 2003; and
- introduced [Plans of Management](#) for three high use and sensitive areas (offshore Cairns, the Whitsundays and Hinchinbrook) to ensure the protection of the natural values and amenity of those areas, and to effectively manage potential conflicts of use and tourism development.

**Current activities to further protect the Great Barrier Reef include:**

- collaborating with State Government agencies, local governments and communities to implement the [Reef Water Quality Protection Plan](#). The Reef Plan is aimed at improving land use and management practices to halt and reverse the decline of water quality in coastal catchments within ten years. Specifically, the GBRMPA has implemented a water quality and ecosystem health monitoring programme to assess the Reef Plan's effectiveness in reducing pollutant loads to the Reef;
- working with the [Queensland Department of Primary Industries and Fisheries](#) to develop a management plan for the East Coast Inshore Finfish Fishery, to improve management arrangements for dive-based fisheries for sea cucumber and coral, and to remove latent effort from the Tropical Rock Lobster Fishery;
- working with the [Queensland Department of Primary Industries and Fisheries](#) to review the existing *East Coast Trawl Fishery Management Plan* and fine-tune existing management arrangements in the East Coast Trawl Fishery;
- working with the Australian Government [Department of the Environment and Heritage](#) on [Fisheries Assessments](#) under the *Environment Protection and Biodiversity Conservation Act 1999*, for fisheries in the Great Barrier Reef Marine Park;
- working with the [Australian Greenhouse Office](#) to develop a Climate Change Action Plan for the Great Barrier Reef. This will identify strategies to mitigate the effects of a warming climate and increase the resilience of the Great Barrier Reef ecosystem, and the industries and communities that depend on it;
- continuing research and monitoring of the Great Barrier Reef's species and habitats, and the pressures affecting them;
- ensuring sustainable traditional use of marine resources by working with [Traditional Owner groups](#) to better manage and monitor activities, especially those that involve the traditional use of [dugongs](#) and [marine turtles](#); and
- strengthening links with the community to better engage and involve communities in the stewardship and management of the Great Barrier Reef Marine Park.

It is clear that the Great Barrier Reef and its managing agencies continue to face significant challenges. New initiatives to address declining water quality (the [Reef Water Quality Protection Plan](#)), to protect biodiversity (the new [Zoning Plan](#)) and to improve the ecological sustainability of fisheries will reduce the pressure on the Great Barrier Reef, and help to ensure that the Reef remains healthy and intact for the enjoyment and use of future generations.



Many challenges face the Great Barrier Reef but moves to improve water quality, protect biodiversity and ensure the ecological sustainability of fisheries, will help to reduce some of the major pressures.

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## Summary of issues updated as of Feb 2006

### Water quality and terrestrial run-off

(see the following chapters for details)

- [Environmental Status – Water quality](#)
- [Environmental Status – Corals](#)
- [Environmental Status – Inter-reefal and lagoonal benthos](#)
- [Environmental Status – Seagrasses](#)

The water quality of the Great Barrier Reef is affected by a wide variety of land-based pollutants including nutrients, sediments, heavy metals, toxic organic contaminants and pesticides. Nutrient and sediment discharge from catchments adjacent to the Great Barrier Reef has increased by approximately four times over the last 100 years due to changes in land use. The effects of run-off are exacerbated by the loss and degradation of wetlands and riparian<sup>3</sup> areas that play an important role in 'filtering' water flowing from the land.



Scientists have concluded that pollution from land-based sources poses a significant risk to the ecosystems of the Great Barrier Reef.

The effects of nutrient-rich pulses of river discharge on inshore ecosystems are not fully understood, but declines in the condition of some of these ecosystems have

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<sup>3</sup> Along the banks of streams or rivers.



occurred. [Independent scientific reviews](#) have been completed and there is [scientific consensus](#) that pollution from terrestrial based run-off constitutes a significant risk to the Great Barrier Reef. Reducing the amount of nutrients flowing into the Great Barrier Reef from coastal catchments is a key management issue.

Urban population growth in coastal areas and major development projects can lead to increased human pressure on the Great Barrier Reef. The discharge of sewage and other effluents directly into the Great Barrier Reef Marine Park is regulated and the practice of recycling treated effluent is increasing in coastal cities. Regulation of discharges, integrated catchment management, changing land management practices and wetland and riparian vegetation protection will help to decrease sediment, nutrient and other pollutant inputs to the Great Barrier Reef.

The GBRMPA participates in State and local government impact assessment processes for proposed developments adjacent to the Great Barrier Reef. The GBRMPA is also working with State and local Governments in regional planning processes to establish water quality targets and promote land use and management practices that are balanced with the protection of the natural values of the Great Barrier Reef.

The joint Australian Government and Queensland Government [Reef Water Quality Protection Plan](#) (Reef Plan) was launched in December 2003. The Reef Plan is the primary strategic framework to cooperatively address water quality in the Great Barrier Reef. The Plan aims to 'halt and reverse the decline of water quality entering the Reef within 10 years'. One of the GBRMPA's main responsibilities under the Plan is to implement the [Marine Monitoring Programme](#) that will help assess the Plan's long-term effectiveness. Funded through the [Natural Heritage Trust](#), the Programme commenced in May 2005 and includes river mouth monitoring<sup>4</sup>, marine water quality monitoring<sup>5</sup>, marine biological monitoring<sup>6</sup> and bioaccumulation monitoring<sup>7</sup>. The [first annual report](#) for the *Marine Monitoring Programme* was released in September 2005 and describes the Programme's design and implementation. The Programme is also coordinated with water quality monitoring programmes run by [Natural Resource Management](#) Boards and State Government agencies in Great Barrier Reef catchments.

The inter-agency [Reef Plan Annual Report](#) (2004-2005) outlines progress on the implementation of Reef Plan activities to 2005. The progress and achievements of the Reef Plan will be reviewed again in 2010.

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<sup>4</sup> River mouth water quality monitoring to assess change over time in concentrations and loads of the major land sourced pollutants that have the potential to adversely affect ecosystems of the Great Barrier Reef.

<sup>5</sup> Water quality monitoring in the near-shore waters of the Great Barrier Reef to assess changes over time in concentrations of key water quality indicators.

<sup>6</sup> Monitoring the health of the major marine ecosystems most at risk from land-based sources of pollutants (mangroves, intertidal seagrass beds and inshore coral reefs).

<sup>7</sup> Monitoring organisms exposed to pollutants to detect subtle differences and accumulation of certain pollutants.

## Protecting biodiversity, ecosystem function and ecological connectivity

(see the following chapters for more information)

- [Environmental Status – Inter-reefal and lagoonal benthos](#)
- [Environmental Status – Corals](#)
- [Environmental Status – Water quality](#)
- [Environmental Status – Marine mammals](#)
- [Management Status – Fisheries](#)
- [Management Status – Indigenous connections with the Great Barrier Reef](#)
- [Environmental Status – Seagrasses](#)
- [Environmental Status – Marine reptiles](#)

Whilst the Great Barrier Reef is best known for its coral reefs, these comprise only 6% of the total area within the Great Barrier Reef Marine Park. Most of the area of the Marine Park is comprised of soft sediment habitats lying in-between coral reefs, between the coast and the barrier reefs, and benthic habitats of the continental slope. Although these areas contain a wide variety of habitats and high biodiversity, much is still unknown about their ecology and current condition. Several habitat types such as deep-water seagrass beds have only been discovered recently. Nevertheless, it is clear that all habitat types, whether coral reefs or lesser-known habitats, are important components of the Great Barrier Reef ecosystem. Seabed communities such as sponge gardens, seagrass beds and rocky shoals create a network of habitats that connect different parts of the Great Barrier Reef together. This [ecological network](#) and its component habitats are important to many marine species, including commercially-important species such as prawns and fish.

The [Representative Areas Programme](#) identified 40 individual non-reef bioregions<sup>8</sup> in inter-reefal, lagoonal and continental slope regions, and 30 reefal bioregions. The Programme also determined that the previous zoning system did not adequately protect the biodiversity of the Reef, with some habitat types, and the plants and animals in them, completely lacking any protective zoning. In July 2004, a [new Zoning Plan](#) for the Great Barrier Reef Marine Park came into effect. The new Plan introduced a scientifically-based network of protected areas that provides better protection for all the types of habitats and biodiversity found in the Great Barrier Reef Marine Park.



The Great Barrier Reef is made up of many different habitats, all of which are essential for the healthy functioning of the Reef ecosystem.

This network will also help to ensure that the biodiversity and ecological functions and connections that sustain the Great Barrier Reef are maintained. Increased levels of pollutants from terrestrial run-off also pose risks to habitats such as seagrass beds.

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<sup>8</sup> A region of similar habitat types, environmental characteristics and biodiversity.

The [Reef Water Quality Protection Plan](#) will be crucial in reducing the pressure from terrestrial run-off on these inter-reefal and lagoonal habitats.

## **Current condition and pressures on coral reef habitats**

(see the following chapters for details)

- [Environmental Status – Corals](#)
- [Environmental Status – Crown-of-thorns starfish](#)
- [Environmental Status – Water quality](#)

The amount of coral cover on the 2,900 coral reefs of the Great Barrier Reef is highly variable over time and across different areas of the Great Barrier Reef. This variation is caused by a variety of human and natural factors, with cyclones, outbreaks of crown-of-thorns starfish and coral bleaching being the major episodic disturbances<sup>9</sup> affecting the corals of the Great Barrier Reef. Overall, the Great Barrier Reef has not experienced the dramatic losses of living coral apparent in some 50% of the world's coral reefs, and trends in decline and recovery appear to be within normal ranges. However, longer-term, localised declines have occurred in some areas and an [independent panel of scientists](#) has concluded that many coral reefs of the Great Barrier Reef are at risk from the impacts of terrestrial run-off.

The latest report from the United Nations [Intergovernmental Panel on Climate Change](#) reaffirms that global climate change is a reality and the evidence that it is being accelerated by human activities is stronger than ever. Warmer sea temperatures associated with [climate change](#) are likely to increase the incidence of coral bleaching on reefs around the world. In 1998 and 2002, the Great Barrier Reef experienced the two worst recorded [coral bleaching](#) episodes, with the 2002 event causing declines of between 50 and 90 percent of coral cover on some inshore reefs.



Protecting biodiversity, reducing land based pollution and ensuring that fisheries are sustainable are vital steps in helping coral reefs cope with climate change.

Declining water quality and overfishing may be contributing to increasing outbreaks of crown-of-thorns starfish, the most recent of which has significantly reduced coral cover in many mid-shelf and offshore reefs between Cooktown and Proserpine. The cumulative pressure from climate change and coral bleaching events, declining water quality and other localised pressures on top of natural disturbance events poses a significant risk to the long-term health of the Great Barrier Reef. The [Reef Water Quality Protection Plan](#) seeks to reduce the pressure on coral reefs from terrestrial run-off. The new [Zoning Plan](#) and improved fisheries management arrangements also

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<sup>9</sup> Disturbance events that occur every now and then, and can cause widespread loss of corals in a short period of time.

aim to increase the protection of key examples of habitats and communities, and to maintain the ecological processes that sustain the Great Barrier Reef ecosystem. Collectively, these initiatives are vital to maintaining the resilience<sup>10</sup> of the Great Barrier Reef and subsequently, the Reef's ability to cope with multiple pressures and global factors such as climate change. The GBRMPA has also developed a [Climate Change Response Programme](#) to better understand the environmental, social and economic risks and impacts posed by climate change in the Great Barrier Reef, and to explore mechanisms to increase the resilience of the Great Barrier Reef ecosystem, and of the communities and industries that depend on it.

## **Ecologically-sustainable fisheries**

(see the following chapters for more information)

- [Management Status – Fisheries](#)
- [Environmental Status – Inter-reefal and lagoonal benthos](#)

As a result of the Offshore Constitutional Settlement, fisheries management in Australia is governed by both legislation and memoranda of understanding between the Australian Government and State Governments. In terms of fisheries, the Queensland Government has legislative power in waters extending beyond State waters provided that the Australian Government and State Government have an agreement in place giving the State such power. Currently, the Queensland Government implements its obligations under these arrangements through the [Fisheries Act 1994](#) (Qld) for all fisheries other than tuna and billfish, in an area extending offshore from the east coast of Queensland that also includes all of the Great Barrier Reef Marine Park. Under this arrangement Queensland has responsibility for fisheries management provisions such as licensing, commercial catch and effort limitations, fishing gear restrictions, closures for fisheries management purposes, and size and in-possession limits<sup>11</sup>.

The GBRMPA, however, continues to have responsibility for the management of the Great Barrier Reef Marine Park under the [Great Barrier Reef Marine Park Act, 1975](#). In essence, the GBRMPA is responsible for the conservation of the fisheries resources of the Great Barrier Reef Marine Park, whereas Queensland is responsible for the management of the fisheries that use these resources. The GBRMPA's management tools include the [Zoning Plan](#) that describes where fishing activities may occur and how they must be conducted. Areas zoned as [Marine National Park](#) or 'green zones' prohibit extractive uses such as fishing and collecting



Effective fisheries management is crucial to the long-term sustainability of fishing, but also to the health of the Great Barrier Reef.

<sup>10</sup> The ability to recover from impacts or disturbances. Healthy reef ecosystems are more resilient and thus are better able to recover from the impacts of cyclones, outbreaks of crown-of-thorns starfish or coral bleaching events.

<sup>11</sup> The allowable sizes and numbers of fish that fishers can possess.

in order to protect the biodiversity and maintain the ecological functions provided by these areas. This helps to sustain the Great Barrier Reef ecosystem and maintain its resilience to increasing pressures. Other zones regulate particular types of activities and recognise the potential impact of different fishing activities on the marine environment: For example, trawling is prohibited in [Habitat Protection Zones](#).

Some of the major issues related to fisheries include concern over declining catches and localised depletions of fish stocks, impacts on bycatch species and habitats, increasing fishing effort, latent fishing effort<sup>12</sup> and compliance. The GBRMPA works closely with various Australian Government and Queensland Government agencies (including the [Australian Customs Service](#), [Queensland Boating and Fisheries Patrol](#), the [Queensland Parks and Wildlife Service](#) and the [Queensland Police Service](#)) to coordinate enforcement and compliance activities aimed at deterring, detecting and prosecuting illegal fishing activities within the Great Barrier Reef Marine Park.

Fisheries management plans have been completed for some fisheries including the East Coast Trawl Fishery and the Coral Reef Finfish Fishery. Several prawn species are commercially harvested from the Great Barrier Reef and there are signs that some of the key species are harvested at or above maximum sustainable levels. Additionally, research has shown that trawling places significant pressure on seabed habitats and results in a large amount of bycatch. The [East Coast Trawl Fishery Management Plan 1999](#) resulted in a significant reduction in fishing effort, in terms of the number of operators in the fishery, the days fished and the areas fished. The Plan also introduced measures to reduce bycatch.



In recent years, fisheries management plans have been introduced for the east coast trawl fishery and the coral reef finfish fishery.

The [East Coast Trawl Fishery Management Plan 1999](#) resulted in a significant reduction in fishing effort, in terms of the number of operators in the fishery, the days fished and the areas fished. The Plan also introduced measures to reduce bycatch.

Concerns over the level of harvest of popular reef fish such as coral trout and red throat emperor led to the introduction of the [Coral Reef Finfish Fishery Management Plan 2003](#), which reduced the number of commercial fishing vessels operating in the fishery, introduced quotas for individual fishermen and a total allowable commercial catch limit, and introduced revised in-possession and size limits based on scientific advice. Under the [new Plan](#), the taking of Maori wrasse, barramundi cod, Queensland grouper and potato cod is prohibited due to conservation concerns. The Plan also introduced three [closures](#) of nine days each between the months of October and December to protect spawning aggregations of coral reef fishes. The [Queensland Department of Primary Industries and Fisheries](#) is revisiting the fisheries management arrangements for the East Coast Inshore Finfish Fishery to address concerns over the ecological sustainability of the fishery. Issues of concern include

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<sup>12</sup> Licences to operate in the fishery that have been issued but are currently not being used.



bycatch of non-target species, and increases in catch and effort in the commercial net fishery.

Several smaller scale fisheries occur in the Great Barrier Reef Marine Park including dive-based fisheries<sup>13</sup>. Generally, there is no bycatch associated with dive-based fisheries, however there are concerns over the sustainability of the rock lobster fishery (particularly if the latent effort in the fishery becomes active), and stocks of the black teat fish (a sea cucumber) have collapsed in the areas in which the fishery operates and show little sign of recovery. Substantial restructuring is proposed for the commercial coral fishery. There are three crab fisheries, but these mostly operate outside the boundaries of the Great Barrier Reef Marine Park.

The introduction of the [Environment Protection and Biodiversity Conservation Act 1999](#) (EPBC Act 1999) requires the fisheries in the Great Barrier Reef Marine Park that export product to be assessed under the [Guidelines for the Ecologically Sustainable Management of Fisheries](#). The GBRMPA has worked closely with the Australian Government [Department of the Environment and Heritage](#) on these assessments and most of the assessments have been completed.

- The Queensland [Spanner Crab Fishery](#) has been assessed and listed as exempt from export controls until February 2007.
- The [East Coast Trawl Fishery](#), [Mud Crab Fishery](#), [East Coast Tropical Rock Lobster Fishery](#), [East Coast Spanish Mackerel Fishery](#) and [Coral Reef Finfish Fishery](#) have been listed as approved [Wildlife Trade Operations](#), meaning that generally they are consistent with the EPBC Act, but require further action to become demonstrably ecologically sustainable. The status of these fisheries as Wildlife Trade Operations will be revisited in 2007.
- The [East Coast Inshore Finfish Fishery](#) has been declared as a Wildlife Trade Operation but this assessment will be revisited in mid 2006.
- The [Marine Aquarium Fish Fishery](#) has been declared as a Wildlife Trade Operation and will be revisited in 2008.
- The [Queensland Coral Fishery](#) is currently being assessed.

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<sup>13</sup> Dive-based fisheries use divers that collect species such as sea cucumber by hand or using hand held tools.