

## EXECUTIVE SUMMARY

The outlook for the Great Barrier Reef ecosystem is at a crossroad, and it is decisions made in the next few years that are likely to determine its long-term future. Unavoidably, future predictions of climate change dominate most aspects of the Great Barrier Reef's outlook over the next few decades. The extent and persistence of the damage to the ecosystem will depend to a large degree on the amount of change in the world's climate and on the resilience of the Great Barrier Reef ecosystem in the immediate future.

This first Outlook Report identifies climate change, continued declining water quality from catchment runoff, loss of coastal habitats from coastal development and remaining impacts from fishing and illegal fishing and poaching as the priority issues reducing the resilience of the Great Barrier Reef. It also highlights gaps in information required for a better understanding of ecosystem resilience.

The Great Barrier Reef is one of the most diverse and remarkable ecosystems in the world and remains one of the most healthy coral reef ecosystems. Nevertheless, its condition has declined significantly since European settlement and, as a result, the overall resilience of the ecosystem has been reduced.


While populations of almost all marine species are intact and there are no records of extinctions, some ecologically important species, such as dugongs, marine turtles, seabirds, black teatfish and some sharks, have declined significantly. Although the declines of loggerhead turtles and dugongs are believed to have halted, there are few examples of increasing populations in species of conservation concern. The obvious example is the humpback whale, which is recovering strongly after being decimated by whaling. Disease in corals and pest outbreaks of crown-of-thorns starfish and cyanobacteria appear to be becoming more frequent and more serious.

Coral reef habitats fluctuate naturally depending on changes in environmental conditions, but they are gradually declining, especially inshore as a result of poor water quality and the compounding effects of climate change. Habitats more remote from human use, such as the continental slope and reefs in the far north are believed to be in very good condition and portions of the lagoon floor are recovering from previous effects of trawling.

Most commercial and non-commercial use of the Great Barrier Reef is dependent on an intact, healthy and resilient ecosystem and it continues to be a significant economic resource for regional communities and Australia. Millions of people continue to enjoy their visits to the Great Barrier Reef. Major changes to the condition of the ecosystem will have social and economic implications.

The Great Barrier Reef Marine Park is considered by many to be a leading example of world's best practice management. However, the effectiveness of management is challenged because complex factors that have their origin beyond the Great Barrier Reef Region, namely climate change, catchment runoff and coastal development cause some of the highest risks to the ecosystem. These factors are playing an increasing role in determining the condition and future of the Great Barrier Reef.

Almost all the biodiversity of the Great Barrier Reef will be affected by climate change, with coral reef habitats the most vulnerable. Coral bleaching resulting from increasing sea temperature and lower rates of calcification in skeleton-building organisms, such as corals, because of ocean acidification are the effects of most concern and are already evident.



The Great Barrier Reef continues to be exposed to increased levels of sediments, nutrients and pesticides, which are having significant effects inshore close to developed coasts, such as causing die-backs of mangroves and increasing algae on coral reefs. Substantial resources are being provided to improve water quality to the Great Barrier Reef, but progress is slow and patchy.

Coastal development is increasing the loss of coastal habitats that support the Great Barrier Reef. Human population increases within the Great Barrier Reef catchment are projected to be nearly two per cent per annum. This will place greater pressure on the ecosystem and increase use of the Great Barrier Reef Region. Integrated planning, knowledge and compliance in managing coastal development are areas highlighted as requiring improvement.

While significant improvements have been made in reducing the impacts of fishing in the Great Barrier Reef, such as bycatch reduction devices, effort controls and closures, important risks to the ecosystem remain from the targeting of predators, the death of incidentally caught species of conservation concern, illegal fishing and poaching. The flow on ecosystem effects of losing predators, such as sharks and coral trout, as well further reducing populations of herbivores, such as the threatened dugong, are largely unknown but have the potential to alter food web interrelationships and reduce resilience across the ecosystem.

Non-extractive uses within the Great Barrier Reef, such as commercial marine tourism, shipping and defence activities, are independently assessed as more effectively managed and are a lower risk to the ecosystem; however the risk of introduced species is likely to increase with projected increases in shipping when global economic recovery occurs. While many of the management measures employed in the Great Barrier Reef Region and beyond are making a positive difference, for example the *Great Barrier Reef Marine Park Zoning Plan 2003*, the ability to address cumulative impacts is weak.

Given the strong management of the Great Barrier Reef, it is likely that the ecosystem will survive better under the pressure of accumulating risks than most reef ecosystems around the world. However, even with the recent management initiatives to improve resilience, the overall outlook for the Great Barrier Reef is poor and catastrophic damage to the ecosystem may not be averted. Ultimately, if changes in the world's climate become too severe, no management actions will be able to climate-proof the Great Barrier Reef ecosystem.

Further building the resilience of the Great Barrier Reef by improving water quality, reducing the loss of coastal habitats and increasing knowledge about fishing and its effects, will give it the best chance of adapting to and recovering from the serious threats ahead, especially from climate change.