

Australian Government Great Barrier Reef Marine Park Authority



THE GREAT BARRIER REEF MARINE PARK ZONING PLAN – 20 YEARS ON

PROTECTING THE GREAT BARRIER REEF FOR FUTURE GENERATIONS © Commonwealth of Australia 2024 Published by the Great Barrier Reef Marine Park Authority

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Front cover © Commonwealth of Australia (Reef Authority).

Aboriginal and Torres Strait Islander readers are advised this publication may contain names and images of deceased persons.

Acknowledgement of Traditional Owners

The Great Barrier Reef Marine Park Authority acknowledges the expertise, wisdom, and enduring connections that have informed the guardianship of the Reef for millennia. We pay our respects to the Traditional Owners as the first managers of this Land and Sea Country, and value their traditional knowledge which continues to inform the current management and stewardship of the Reef for future generations.

For the Traditional Owners of the Sea Country known as the Great Barrier Reef, this ever changing, diverse ecosystem has been interwoven with their daily lives for tens of thousands of years. This multi-generational relationship spans the entire formation of the modern Reef that built up over the past 10,000 years as sea levels rose some 120 metres after the last ice age. The rising waters engulfed much of the Queensland coastline enabling the modern Reef to grow on the peaks of the inundated landscape and remnants of the ancient Great Barrier Reef that is estimated to be between 400,000 and 600,000 years old. The response of local people to the rapid rise in sea level and the formation of the modern Reef are captured in the oral history of many of the 70 Traditional Owner groups that call Reef Sea Country home. The cultural practices, sense of identity, art and lore of the Region's Traditional Owners reflect their deep, long-term connection with the Reef, its component habitats and myriad species. The critical importance that these 70 groups place on protecting Sea Country reflects the fundamental connection between Reef health and their quality of life.



Nautilus Shell Artwork © 2023 by Laurence Gibson, Yalanji Arts, Mossman Gorge

Foreword

Protected area management matters for the future of the world's most precious natural environments.

Few marine environments have the richness of values, iconic status and world-leading management of the Great Barrier Reef (the Reef). For nearly 50 years, the Great Barrier Reef Marine Park Authority has been a global exemplar of innovative marine conservation through holistic protected area management. The management of the Reef has continued to adapt to a changing environment through:

- science and monitoring
- new technologies
- threat reduction programs
- conservation actions
- community education
- stakeholder engagement and participation.

As global ecosystems continue to be challenged by the pressures of climate change, habitat loss, pollution and unsustainable extractive activities, protected area management is increasingly needed to conserve biodiversity, maintain ecological integrity and function, and enable ecologically sustainable use. It is one of the most important management tools available for governments, communities, industry and Traditional Owners in safeguarding nature for future generations.

Developing enduring management arrangements for natural and mixed-use environments is rarely straightforward. Indeed, as the Reef example highlights, protecting habitats and the species they support is more complex than just drawing lines on a map. It requires robust understanding of the ecosystem and how it functions, industry and cultural use, and the resources and laws to encourage compliance. The *Great Barrier Reef Marine Park Zoning Plan (2003)* is both a celebratory milestone and an opportunity to assess the outcomes and consider future initiatives in protected area management.

I commend this document to marine scientists, park managers, First Nations communities, industry organisations and the wider public. Just as we all rely on nature to support our everyday lives and wellbeing, nature also relies on us to protect and conserve it for the future.

Josh Thomas

Chief Executive Officer Great Barrier Reef Marine Park Authority

Great Barrier Reef

While coral reefs only cover around one per cent of the world's ocean floor, they are home to a quarter of all marine species, making them equivalent to rainforests as global hotspots of biodiversity and magnifying their importance for protection.

Visible from space, the Great Barrier Reef is famous for being the largest coral reef ecosystem and living structure on Earth, encompassing around 10 per cent of the world's coral reef area. It comprises more than 3000 individual reefs, spans more than 344,000 km² (around the size of Germany) and stretches 2300 km along the Queensland coast. By any measure the Great Barrier Reef is truly vast. The modern Reef is a source of inspiration, livelihoods, food and recreation for all who have settled along the Queensland coast. Today, it is arguably the jewel in the crown of Australia's marine estates and a source of national pride for all Australians. The Reef remains an irresistible drawcard for millions of visitors from around the world, sustaining a vibrant and profitable tourism industry founded on one of the world's most iconic natural wonders.

Effective management of the Reef and the biodiversity it supports requires a holistic management approach founded on the identification and protection of a representative network of the ecosystems that underpin its resilience.

The Great Barrier Reef at a glance



Figure 1. The Great Barrier Reef - a biodiversity hotspot of international significance.

Reef protection

The *Great Barrier Reef Marine Park Act 1975* (the Act) received Royal Assent on 20 June 1975 following multiple years of debate about risks to and the future use of the Reef, including potential mining and oil drilling.

The Act established the Great Barrier Reef Marine Park Authority (Reef Authority), the Great Barrier Reef Region (the Region) and the ability to proclaim sections of the Great Barrier Reef Marine Park to address the Act's objects. Since 1975, the Act has been reviewed and amended on several occasions. The current objects of the Act serve as the foundations for all of the Reef Authority's work.

The Act's primary object is;

"to provide for the long term protection and conservation of the environment, biodiversity and heritage values of the Great Barrier Reef Region (the Region)".

The Act also includes secondary objects that must be consistent with the main object:

- a) allow ecologically sustainable use of the Great Barrier Reef Region including:
 - i) public enjoyment and appreciation
 - ii) public education about and understanding of the Region
 - iii) recreational, economic and cultural activities
 - iv) research into the natural, social, economic and cultural systems and value of the Great Barrier Reef Region
- (b) encourage engagement in the protection and management of the Great Barrier Reef Region by interested persons and groups, including Queensland and local governments, communities, Indigenous persons, business and industry
- (c) assist in meeting Australia's international responsibilities in relation to the environment and protection of world heritage (especially Australia's responsibilities under the World Heritage Convention).

The reference to Australia's international responsibilities under the 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) in the secondary objects the Act reflects the level of importance that Australia continues to place on protecting World Heritage properties. Australia was one of the first countries to ratify the World Heritage Convention in 1974.

In 1981, the Great Barrier Reef became the first coral reef ecosystem inscribed on the World Heritage List, meeting all four natural criteria for listing which recognised:

- its phenomena and exceptional natural beauty
- its representation of major stages of Earth's evolutionary history
- its significant ongoing ecological and biological processes
- that it contains the most important and significant habitats for conservation of biodiversity.

For nearly 50 years the Reef Authority has worked to meet the objects of the Act, including protection of the outstanding universal value of the Great Barrier Reef World Heritage Area in partnership with the other Commonwealth and Queensland government departments.

Representative Areas Program

Since the Act's 1975 establishment, multiple-use zoning management has been progressively implemented. Under the Act, once an area has been proclaimed as part of the Great Barrier Reef Marine Park, a zoning plan (where zones separate conflicting uses and define the spatial boundaries of activities that may or may not require permission) must be prepared. The first zoning plan was developed in 1981 for the Capricornia Section.

In 1998 the Commonwealth, States and Northern Territory governments committed themselves to establishing a National Representative System of Marine Protected Areas by 2012. The Australian Government affirmed this commitment at the United Nations World Summit on Sustainable Development in 2002. The primary goal was to establish and effectively manage a comprehensive, adequate and representative system of marine reserves to contribute to the long-term conservation of marine ecosystems and to protect marine biodiversity. The Reef Authority's Representative Areas Program (the Program) was consistent with the National Representative System of Marine Protected Areas aims, being:

- **Comprehensive** including the full range of ecosystems recognised at an appropriate scale within and across each bioregion
- Adequate have the required level of reservation to ensure the ecological viability and integrity of populations, species and communities
- **Representative** reasonably reflect the biotic diversity of marine ecosystems.

At this time, less than five per cent (4.6%) of the previously declared Marine Park was fully protected from extractive activities. Those no-take areas were focused on coral reefs that were widely dispersed across the enormous 344,400 km² area. The sheer scale of the Reef, the wide range of environmental conditions and the vast array of habitats and species that it supports, led the zoning architects to conclude that an expanded representative network of no-take areas was required. This led to the Representative Areas Porgram - a six-year journey by dedicated teams of managers, scientists, industry and community members. State-of-the-art science was used to enhance long-term protection of the Reef, consistent with the primary object of the Act.

The Representative Areas Program aimed to increase protection of the biodiversity of the Great Barrier Reef by establishing a network of 'no-take' areas. These areas would protect representative examples of all broad-scale habitats as part of a new zoning plan. When the Program began, there were five separate Marine Park zoning plans and an additional 28 areas that had been proclaimed to be part of the Marine Park yet without zoning plans in place. The Representative Areas Program process is described in the following figures (Figure 2) and culminated in the Amalgamated Great Barrier Reef Section, governed by a single zoning plan, the *Great Barrier Reef Marine Park Zoning Plan 2003*. This zoning plan took effect on 1 July 2004.

The Great Barrier Reef Representative Areas Program

An ecosystem approach to protecting biodiversity



Figure 2. Great Barrier Reef Representative Areas Program planning process.

Design underpinned by science

The Representative Areas Program design reflected the unique challenges of managing the vast Great Barrier Reef ecosystem, which spans multiple gradients of environmental conditions that have shaped the wide variety of habitats that are found today.

The design process brought together existing datasets and expert assessment to identify 70 bioregions (30 reef and 40 non-reef regions – Figure 2) that made up the broad habitats within the Reef.

The 40 non-reef bioregions encompass a diverse range of key habitats including seagrass meadows, halimeda banks, inter-reefal seafloor areas, as well as pelagic environments (Figure 3a). The non-reef bioregions span the majority of the area of the Marine Park and are interspersed with the 30 reef bioregions that are characterised by the presence of corals (Figure 3b), the animals that build the threedimensional foundations of the 3000 individual reefs for which the Great Barrier Reef is famous.

To support the development of the Representative Areas Program, the Reef Authority convened two independent committees – an independent Scientific Steering Committee (SSC) to develop biophysical operational principles to guide the selection of no-take areas; and a Social, Economic and Cultural Steering Committee tasked with maximising beneficial and minimising detrimental impacts of the Program to local communities and stakeholders while delivering the overarching biodiversity protection outcomes. The membership of the steering committees were decided after consultation with more than 70 of Australia's top scientists with expertise in the Reef. The SSC provided advice to the Reef Authority confirming the scientific basis for zoning, noting that the "existing network of Green Zones (no-take areas) in the Great Barrier Reef Marine Park is insufficient to maintain the biological diversity and ecological integrity of the Great Barrier Reef into the future."

The steering committee also confirmed support for the zoning process and expressed a consensus view that increasing the proportion of no-take zoned areas to at least 20 per cent of each of the 70 bioregions would help:

- maintain biological diversity at the levels of ecosystem, habitat, species, population and genes
- 2) allow species to evolve and function undisturbed
- provide an ecological safety margin against human-induced disasters
- provide a solid ecological base from which threatened species or habitats can recover or repair themselves
- 5) maintain ecological processes and systems.

To guide the Representative Area Program process the steering committees and Reef Authority established a series of governing principles: 11 biophysical operating principles and four social, economic and cultural and management feasibility operational principles. These principles were used to guide each step of the zoning design, consultation and refinements that followed.



Biophysical operating principles

- 1) Have no-take areas the minimum size of which is 20km along the smallest dimension
- 2) Have larger (versus smaller) no-take areas
- 3) Have sufficient no-take areas to insure against negative impacts on some part of a bioregion
- 4) Where a reef is incorporated into no-take zones, the whole reef should be included
- 5) Represent a minimum amount of each reef bioregion (\geq 3 reefs, \geq 20%) in no-take areas
- 6) Represent a minimum amount of each non-reef bioregion (\geq 3 reefs, \geq 20%) in no-take areas
- 7) Represent cross-shelf and latitudinal diversity in the network of no-take areas
- 8) Represent a minimum amount of each community type and physical environment type in the overall network taking into account principle 7
- 9) Maximise use of environmental information to determine the configuration of no-take areas to form viable networks e.g. connectivity
- 10) Include biophysically special/unique places
- 11) Include consideration of sea and adjacent land uses in determining no-take areas.

Social, economic and cultural and management feasibility principles

- 1) Maximise complementarity of no-take areas with human values, activities and opportunities
- 2) Ensure the final selection of no-take areas recognises social costs and benefits
- 3) Maximise placement of no-take areas in locations that complement and include present and future management and tenure arrangements
- 4) Maximise public understanding and acceptance of no-take areas, and facilitate enforcement of no-take areas.

An iterative zoning design process used the operating principles, analytical planning tools (Marxan) and stakeholder consultation feedback to establish a network of Marine Park zones. The zones allowed for multiple uses while extending a high level of protection (no-take or green zone) to a minimum of 20 per cent of each bioregion. The resulting network spans a third of the total area (Figure 4).



Figure 3. Bioregions of the Great Barrier Reef: Non-Reef Bioregions (panel 3a) and Reef Bioregions (panel 3b).





Figure 4. Great Barrier Reef Marine Park zoning before (panel 4a) and after (panel 4b) the 2003 Zoning Plan came into effect from 1 July 2004. © Commonwealth of Australia



Layering spatial management

In addition to better protecting the full range of habitats of the Reef, the Zoning Plan also established new management arrangements including: Traditional Use of Marine Resources Agreements, the ability to accredit research and educational institutions thereby removing the need for individual permission applications for low risk activities; legislative protection for a range of species under the Great Barrier Reef Marine Park Act, and the ability to declare Special Management Areas in the Marine Park Regulations that allow specific areas of the Marine Park to be afforded further protection either permanently or for periods of time.



Lessons learned

Disseminating the lessons from the Representative Areas Program and designing a new network of zoning for the Great Barrier Reef Marine Park was important for the Reef Authority.

This would ensure others could learn and adapt for their own use as well as for corporate knowledge within the agency. There was a strong focus on published peer reviewed papers on methodology, given at the time this was the largest public consultation program undertaken for the Great Barrier Reef. Since this time, more than 100 peer reviewed and technical publications have been published and an equivalent number of presentations have been given at conferences, international meetings and within the local Reef community.

Some of the key lessons included the value of:

- a robust regionalisation linked to clear operating principles that were publicly available. This allowed a logical framework to be established with defensible outcomes;
- input from Reef community members and stakeholders, including the Reef Authority's Local Marine Advisory Committees;
- a strategic communications strategy to deliver messages to different audiences and using different engagement techniques.

In addition there was a formal, government review of the Representative Areas Program that set out a clear direction for the future management of the Great Barrier Reef Marine Park. Recommendations resulted in up-to-date, relevant legislation and an approach that provides for continued protection for marine life and biodiversity, as well as for ongoing sustainable economic and recreational activity and engagement with business and local communities.

Review of the Great Barrier Reef Marine Park Act 1975 (2006)

Day, J.C. (2020) Ensuring effective and transformative policy reform: lessons from rezoning Australia's Great Barrier Reef, 1999-2004. PhD thesis, James Cook University, Townsville, Australia.

An independent review of the zoning was conducted in 2006. While the review did not revisit the outcomes of the 2003 Zoning Plan, the planning process itself was reviewed, i.e. the consultation, accountability, and regulatory frameworks. The review acknowledged '...the RAP/rezoning was a significant undertaking for which there was no precedent in terms of scale, scope and process [emphasis added]...' (p. 166). The review also acknowledged that GBRMPA had '...a well-considered scientific basis... made extensive efforts to achieve effective engagement... held a large number of meetings with stakeholders... and sought to achieve a balanced outcome between alternative uses...' (p. 166).

...To a large extent the concerns raised by stakeholders in regard to the 2003 Zoning Plan process arise from disagreement with the scientific underpinning, and perceptions of a lack of transparency, accountability, and due process. While not sharing all these concerns, the Review Panel proposes that any future zoning arrangements be undertaken following approval of the process and operational principles by the Minister, that they allow for extended public consultation and that they be based on substantive socio-economic and biophysical information... (p. 11)

The Review report acknowledged that more than 66 major changes were made to the draft Plan to accommodate submissions made by the commercial and recreational fishing sectors. The review also presented a case study for one area of the Great Barrier Reef Marine Park, the Capricorn Bunker Region, showing the significant changes between the draft Zoning Plan and the final 2003 Zoning Plan.

The 2006 review findings also stimulated a number of key reforms including i) the requirement for a five-yearly Outlook Report (as a regular and reliable source of information for government to use to identify management actions as well as a key input for any review of the zoning plan), ii) evaluation of the composition of the Marine Park Authority Board, iii) changes to the primary object of the Act (see text box 1), iv) addition of the concept of ecosystem based management into the Act and change from essentially a corporate agency or a non-corporate agency; introduced concept of ecosystem based management into our Act.

Outcomes

Governments working together

The Australian and Queensland goverments signed the 1979 Emerald Agreement in recognition of the need for long-term planning and cooperation for the protection of the Great Barrier Reef. This agreement has evolved over time and today, the Great Barrier Reef Intergovernmental Agreement 2015, still forms the basis for strategic planning, coordination of policy and regulation, and the delivery of day-to-day management actions via the jointly funded Reef Joint Field Management Program.

The Representative Areas Program design built upon the Emerald Agreement to accommodate the critical need for consistent, complementary management across the Region. Together the (Commonwealth) *Great Barrier Reef Marine Park Zoning Plan 2003* and the (Queensland) *Marine Parks (Great Barrier Reef Coast) Zoning Plan 2004* reinforce the complementary management that has been in place since 1979.

The zoning plan has enabled these measures while also continuing the legal framework for the joint Marine Parks permissions system and the compliance actions by the Reef Joint Field Management Program.



A global example

Australia's zoning reforms set a new standard in marine conservation that stands to this day, with more than 33% of the Great Barrier Reef now protected under non-extractive areas.

Over the past 20 years, the Reef Authority has, and continues to, work with other nations and through international organisations to support the development of greater marine protection and conservation arrangements around the world. The Reef Authority was Australia's focal point in the formation of both the International Coral Reef Initiative (ICRI) and the International Marine Protected Area Congress (IMPAC).

Through knowledge sharing and leadership exchange, the Reef Authority has worked closely with countries throughout the Pacific region and around the world in an effort to protect coral reef ecosystems. Most recently the Reef Authority facilitated the Pacific Coral Reef Collective which brought together reef managers and designated partners from 14 Pacific countries to address shared challenges facing coral reefs, and explore innovative solutions being implemented to improve reef resilience.

Outlook Report

Every five years, the Reef Authority publishes a comprehensive Outlook Report which examines the Great Barrier Reef's health, pressures, and likely future. The report is required under the Great Barrier Reef Marine Park Act 1975 (section 54) and aims to provide a regular and reliable means of assessing the Reef's health and management in an accountable and transparent way.

The 2024 Outlook Report (the Report) is the fourth comprehensive report in the series and will outline the significant pressures impacting the Reef, ranging in scale from local to global, as well the world-leading management actions being undertaken by the Reef Authority and our partner network to reduce these pressures and further build Reef resilience.

Benefits

Two decades on, the evidence from numerous monitoring and evaluation studies demonstrate the benefits of the zoning. There is near universal acceptance that expanding the notake areas was in the best interest of the Reef and everyone who relies on and cares about it. Nevertheless, many of the scientists, managers and community members who were involved still reflect on the process as having been a very difficult yet critical foresightful reform.

The primary objective of the Representative Areas Program was to conserve the full range biodiversity and ecosystem function in the Region by protecting at least 20 per cent of all reef and non-reef bioregions through an expanded network of no-take areas (Marine National Park – Green Zones). The opportunity to rezone the entire area allowed for additional benefits, with the increase in the Habitat Protection Zone also providing greater protection from activities that might otherwise damage the seafloor. The Program was also anticipated that the new zoning network would support stocks of fished species on reefs that were closed or partially closed to fishing. Scientific evidence demonstrating fishery sustainability benefits of no-take areas was scarce prior to the rezoning.

Ongoing research has shown that these direct outcomes have been realised on the Reef, primarily because the network approach to the design has been coupled with ongoing investment in effective compliance enforcement. In addition, more recent published studies have highlighted the benefits of partially protected areas declared through zoning or had Special Management Areas in place to manage use. The explicit identification and inclusion of 40 nonreef bioregions (Figure 3) within the zoning network has afforded the highest levels of protection to representative areas of all of the habitats found in the Marine Park. While some of these habitats and the species they support are less well studied, they support many keystone and iconic Reef species including seagrass meadows that support dugongs and marine turtles.

Many of these habitats and the species that they support are also essential for ecosystem processes such as carbon uptake from the atmosphere, nutrient cycling and primary productivity. Like the reef bioregions, most non-reef habitats are also vulnerable to the effects of greenhouse gas emissions through tropical storms, increasingly frequent marine heatwaves, sea level rise and changes in ocean chemistry. While these bioregions may not be affected as soon as, or as severely as coral reefs, enhanced spatial protection was and remains consistent with the objects of the Act and the precautionary principle.

Enhanced protection of the reef and non-reef bioregions directly supports tens of thousands of Queensland jobs associated with commercial and non-commercial activities. The flow-on effects are in the billions of dollars each year, representing significant components of the Queensland and Australian economies.

GREEN ZONES FOR A MORE RESILIENT REEF

DID YOU KNOW GREEN ZONES RECOVER UP TO 20% FASTER THAN BLUE ZONES FROM IMACTS INCLUDING:





bleaching



disease







Weather events

THE 'SPILLOVER' EFFECT



Protecting larger breeding stock in green zones

BLUE

means more fish in areas open to fishing.

A 50cm coral trout can produce more than **3x** as many eggs as a 35cm coral trout.

Figure 6. How green zones are working.

Spillover effect

Since 2004, the "spillover effect", where a greater abundance of large fish in fully protected areas significantly increase the number of juvenile fish that migrate out to adjacent areas open to fishing, has been confirmed through dedicated studies. Recognition of these zoning benefits also appears to underpin increasing observations of commercial and recreational fishers fishing along the perimeters of green (no-take) zones to take advantage of the spillover effect.

The coastal protection and fisheries productivity outcomes of enhanced protection are also significant. Research suggests that biomass of some fished species is increased in no-take (green) zones compared with take (blue) zones. The spillover effect underpins this reality and these benefits have accrued against a backdrop of significant cumulative impacts.

Resilience

While an improvement in fish stocks was not surprising, the Australian Institute of Marine Science's Long-Term Monitoring Program research has demonstrated resilience benefits to both target fish stocks and to coral reef habitats. This work has demonstrated that reefs in no-take (green) zones are overall more tolerant to and show improved recovery rates to disturbance events compared to open (blue) zones.

While they are confident that this benefit continues, AIMS scientists are still evaluating why benthic (seafloor) coral communities show greater resilience in green than blue zones. It is likely that there are several factors at play including more intact food webs that include abundant predatory fish (many of which are targeted by fishers) whose presence protects the capacity of corals to tolerate impacts thereby enhancing the speed at which communities re-establish. Anchor damage to corals on heavily fished and used reefs has also been considered as a potential factor in the resilience differences across the zoning regimes, leading to increased deployment of moorings and no-anchoring areas across the Reef in areas that are regularly used.

Coral predation

Comparisons of crown-of-thorns starfish outbreak dynamics across different zones also provides some insight into the observations of enhanced coral community resilience. Multiple publications have indicated a lower frequency of crown-of-thorn starfish outbreaks on green versus blue zone reefs over the past 15 years. A 2020 evaluation of this phenomenon confirmed earlier findings and also showed a lower frequency of crown-of-thorn starfish outbreaks in yellow zones (where some recreational fishing is allowed) though the protective effect was not as strong as in green zones where it was shown to be four times lower.

Recent research, using eDNA to examine the gut contents of numerous predatory fish species that are targeted by commercial and recreational fisheries showed that a far greater number of predators eat crown-of-thorn starfish than had been previously observed. The summary being that on reefs with higher densities of predatory fish, it is now thought that there is extensive downwards pressure within the foodwebs - large predators hunt smaller predators that then stay closer to the reef matrix and in turn are then more likely to feed on everything close to them including potentially less desirable spiky, venomous starfish.

The evidence supporting this rationale extends to the findings of crown-of-thorn starfish eDNA within coral trout - large predatory fish that are not thought to directly feed on crown-of-thorn starfish but do feed on other predatory fish that do. Coupled with other research showing a larger proportion of scars and lost limbs on juvenile and adult crown-of-thorn starfish found on green zone reefs provides a strong case that predators play an important role in crown-of-thorns starfish outbreaks dynamics on the Great Barrier Reef, with Reef-wide consequences for trends in coral health and resilience.

The zoning research has revealed another important consideration for the selection of control reefs particularly in the presence of cumulative impacts where recovery may be compromised. This is an ongoing area of collaboration between researchers and managers that may further enhance the proven efficacy of the Crown-of-thorns Starfish Control Program in delivering regional scale coral habitat protection outcomes.

Climate change

While climate change impacts were beginning to affect the Reef in the lead up to the zoning reforms, notably in the 1998 and 2002 mass coral bleaching events, addressing those emerging impacts was not the primary focus of the Representative Areas Program. Rather, the process was designed to ensure effective representation of the full range of Reef species and habitat values found within the Great Barrier Reef. Although not an explicit objective, the application of the biophysical operating principles, the ecosystem protection approach and application of the precautionary principle to the zoning design meant the resulting protection network did include an ecological safety margin - "insurance factor" - in the area that was afforded no-take protection to buffer against significant environmental disturbances. That foresight reflected mounting scientific concerns about the spectre of climate change and its emerging effects upon reef health dynamics.

Since 2004, in recognition of the increasing influence of climate change on coral reefs and their users, marine protected area managers around the world have further adapted their approach to focus on resilience-based management (RBM). RBM recognises the importance of the human dimensions of resilience both in terms of how human behaviours can positively or negatively influence investment in resilience protection measures but also the key role that local stewardship can play in their delivery.

The *Reef 2050 Long-Term Sustainability Plan* (Reef 2050 Plan), first published in 2015, is the overarching framework for protecting and managing the Great Barrier Reef to 2050. It is updated every five years and builds upon the cooperative platform to ensure a common focus for the wide range of government actions that have been established to secure the future of the Great Barrier Reef.

Great Barrier Reef Blueprint for Climate Resilience and Adaptation (Reef Blueprint 2030) is the Reef Authority's strategic roadmap to strengthen Reef resilience and is a key deliverable of the Australian and Queensland government's Reef 2050 Plan. At the heart of the Reef Blueprint 2030 are five strategic goals that will drive how the Reef Authority adapts its management to a changing climate so we can progressively and effectively respond to the risks identified in the Outlook Report.

Reef Blueprint 2030 Strategic Goals

Protect the Reef's resilience

Deliver world-leading resilience-based management that effectively addresses the key threats to the Marine Park, minimises pressures on vulnerable species and habitats, and supports a functioning ecosystem.

Enhance the Reef Authority's capability

The Reef Authority's management capability is underpinned by globally-recognised policy and legislation, strategy development, decision making, and data and knowledge.

Co-manage Sea Country with Traditional Owners

Great Barrier Reef management is conducted in a manner that acknowledges, respects, and supports the inherent rights, interests, and aspirations of Great Barrier Reef Traditional Owners.

Empower others to protect and manage

The Great Barrier Reef is a rallying point for domestic and international partnerships for action on climate change, Reef protection, and knowledge sharing on marine protected area management.

Do our part to reduce emissions

The Reef Authority is doing everything in our power to contribute to reducing greenhouse gas emissions and limiting global temperature increase to 1.5°C of warming, or as close as possible.

Future

The Representative Areas Program process and resulting zoning plan represent a key milestone along the Reef Authority's nearly 50-year journey of adaptive management. The reform fundamentally changed the protection of the Great Barrier Reef delivering a foresight-based investment in the Reef's future that continues to provide protection and resilience benefits to this day.

The Great Barrier Reef Marine Park Zoning Plan has provided a strong foundation around which management agencies and others have been able to address competitive and/or mixed use of the Region, and develop supporting guidance, educational materials, enforcement programs and long-term monitoring and modeling programs.

As the world changes in the context of a rapidly changing climate, so too must our approaches to protecting coral reefs.

Traditional Use of Marine Resources Agreements

There has been a gradual and respectful evolution of engagement with Traditional Owner communities on a journey towards co-management of Country for both biodiversity and cultural outcomes. These spatially-described and culturally-significant marine resource agreements with First Nations Australians are a wonderful example of public-funded, community-led planning. These agreements have evolved through time to become an organising frame through which Traditional Owners of the Great Barrier Reef are able to recapture and express their Cultural Knowledge and practise for the betterment of their People and their Country. With approximately 70 Traditional Owner Groups along the vast and sparsely-populated Queensland coastline, Traditional Use of Marine Resource Agreement groups will be a growing and ever more relevant platform for mobilising community effort to protect nature.

Southern Plan of Management

At the time of writing, the Great Barrier Reef Marine Park Authority is developing a new, Traditional Owner-led management plan for the southern section of the Reef. This will complement the underlying zoning plan and provide another opportunity to evolve policies and practises.

Technology

The Reef Authority continues to improve conservation actions through the application of emerging technologies in automation, remote surveillance to target actions, artificial intelligence to model and monitor ecosystems and improve understanding of use, engagement, education, safety and compliance.

Stewardship

The work of all of the Reef Guardians who assisted in the design and implementation of the zoning plan stands out as an example of the effort and partnerships that are now required to meet the climate challenge. The holistic approach to Sea Country that is embedded in the lives of the Reef's Traditional Owners embodies the recipe for resilience-based management. In the words of Traditional Owners at the 2024 Reef Resilience Symposium, "we need to have our heads, mouths and feet pointing in the same direction".

International best-practice and knowledge sharing

Our gloabalised world is racing to keep up with the increasingly complex and trans-border impacts of climate change, marine debris and pollution, habitat and species loss, over-fishing and urbanisation.

To be effective we need to acknowledge that the Reef is going to change significantly in the coming decades, that it will need our support to protect its integrity and resilience, and that we won't be able to do everything. Inevitably this means complex, challenging decisions about which actions to prioritise for the benefit of the generations to come.

Enabling new science for Reef restoration

Reef management is fundamentally a collective effort, and the Reef Authority relies on the expertise and knowledge of our partners to ensure the Great Barrier Reef remains a global leader in marine park management and protection

Under the Reef Restoration and Adaptation Program (RRAP), which is funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation, world-leading marine scientists are developing and trialling a range of innovative solutions to help protect, restore and build more resilient reefs.

The goal is to provide reef managers and decisionmakers with a range of acceptable and cost-effective interventions to help protect the Reef from the impacts of climate change, in conjunction with best-practice reef management, and reducing carbon emissions through a strategic three-point approach focusing on:

- cooling and shading the Reef to help protect it from the impacts of climate change
- assisting Reef species to adapt to the changing
 environment
- supporting natural restoration of damaged and degraded reefs.

While RRAP is initially focused on developing technology and solutions to help the Great Barrier Reef, these solutions could also be applied to other reefs in Australia and around the world. Twenty years on from a complex, challenging decision there is clarity that ongoing investment in the zoning plan still represents the best foundational conservation action that we can take to fulfil the primary object of the Great Barrier Reef Marine Park Act.

For close to five decades, the Reef Authority has been taking actions consistent with Australia's obligations under the World Heritage Convention and the objects of the Act, including the design, enhancement and implementation of a protected area zoning plan and plans of management that govern the spatial boundaries for what is permitted in the Marine Park. The Reef Authority has always taken, and will continue to take, an adaptive, ecosystem-based partnership approach to assess the risks and design and refine Reef protection and conservation actions to protect the Reef for future generations.

Through the work of the Reef Authority, and that of our comprehensive partner networks, Australia is well-placed to extend our knowledge and remain at the forefront of safeguarding precious marine habitats globally.

We are committed to continue working through important international fora such as the International Coral Reef Initiative (ICRI), Convention on Biological Diversity (CBD), International Marine Protected Area Congress (IMPAC), and bilaterally with other nations to exchange ideas, share knowledge and advance conservation outcomes for coral reef systems worldwide, including our own iconic Great Barrier Reef.

Awards and recognition

The following quotes reflect the widespread recognition of the Program from a range of expert led multi-author papers.¹

...The RAP, and its use in the rezoning of the reef, is an innovative approach... becoming a role model for policy development elsewhere... (Olsson et al., 2008, p. 9493). [Stockholm Resilience Centre, Sweden]

...The Great Barrier Reef... boasts a system-wide spatial management approach that is arguably the world's most sophisticated and extensively implemented example of marine zoning... (Ruckelshaus et al., 2008, p. 59). [Stanford University, USA]

...The Great Barrier Reef Marine Park... may well provide the best example of large-scale ocean zoning in existence today... (Agardy, 2010, p. 60). [Sound Seas Foundation, USA]

... the 2004 rezoning of the GBR was exemplary (p. 480)... it remains one of the world's best examples of representing marine biodiversity... (p. 498) (Devillers et al., 2015). [Research Institute for Sustainable Development, France]

...When the marine park was rezoned... a dramatically enhanced management system... a rare example of an ecosystem-based approach... (Hughes et al., 2015, p. 588). [Australian Research Council Centre of Excellence for Coral Reef Studies, Australia]

... The level of representation achieved in the Great Barrier Reef is exceptional... (Barr and Possingham, 2013, p. 45) [University of Queensland, Australia]



The Representative Areas Program used the best available science, including the use of a customised protected area decision support tool (Marxan) to optimise the protection and use benefits within the draft and final stages of the spatial design. At the time the approach was unprecedented in scale and ambition, profoundly influencing marine protected area design and management in Australia and around the world in the following decades.

Across the scientific and conservation sectors the zoning received widespread support as an essential measure to secure the future of the Great Barrier Reef and as a best-practice case study for effective marine protected area design and management for coral reef ecosystems around the world.

On the global stage, nationally and within Queensland the extensive, comprehensive stakeholder consultation and iterative zoning design and subsequent implementation process received strong endorsement.

The Representative Areas Program achieved national and international recognition for the pioneering work including:

- 2004 Eureka Prize for Biodiversity Research
- 2004 Planning Institute of Australia, Overall Winner for Excellence in Planning
- 2004 Banksia Environmental Award for Government Leading by Example for a Sustainable Future
- 2005 Sultan Qaboos Prize for Environmental Preservation for UNESCO's Man and the Biosphere Programme
- 2007 Excellence in Marine and Coastal Management Award at the United Nations Association of Australia World Environment Day Awards
- 2008 'Top 25' Ecological Restoration Projects in Australasia selected by the Global Restoration Network
- 2010 World Future Council's Silver Future Policy Award for the Australian Government's efforts to protect the Great Barrier Reef in particular the statutory Zoning Plan based on the Representative Areas Program.

A full list of awards is available on the Reef Authority's website.

¹Drawn from (Day, J.C. 2020) as per previous page.

The Great Barrier Reef is one of our greatest natural wonders, and an integral part of Australia's identity. To the countless contributors, key partners, pioneers, marine experts, community members, decision-makers and Reef guardians that have supported one of the world's great examples of marine protected area management, we say thank you. Your contribution continues to make a difference. Long may it continue.



Australian Government Great Barrier Reef Marine Park Authority



