Protecting Biodiversity:

an overview of the Great Barrier Reef Marine Park Authority Representative Areas Program

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Introduction

The Great Barrier Reef World Heritage Area (GBRWHA) is famous for its 2900 coral reefs. However the Area also has an incredible variety of other habitats ranging from sandy cays, continental islands, algal and sponge gardens, mangrove estuaries, seagrass beds, sandy and muddy seabed communities. These habitats and their interconnectedness make it one of the richest and most complex natural systems on earth—an area famous the world over for its biodiversity.

The Great Barrier Reef Marine Park Authority (GBRMPA) is working on a Representative Areas Program to enhance protection of the biodiversity of the GBRWHA. This Program is part of Australia's national Representative Areas Program and builds on previous work conducted at the Authority and with stakeholders from 1996 to 1998.

If planning in an area the size of the GBRWHA is to be successful, information and advice from individuals and

organisations with knowledge or an interest in the region needs to be fed into the process. This document outlines the significant and unique qualities of the GBRWHA and the importance of maintaining the biological diversity it contains. The steps involved with the Representative Areas Program are described. Answers to some commonly asked questions are also included.

Most importantly this document outlines an approach to ensuring that your views are heard in regard to the planning of representative areas—areas important for all our futures.

The Great Barrier Reef World Heritage Area

The Great Barrier Reef World Heritage Area stretches 2300 kilometres along Australia's eastern seaboard from Lady Elliott Island in the south to Australia's northern tip at Cape York, spanning 14 degrees of latitude. It is by far the largest World Heritage Area on earth (347 800 $km^{2)}$. The sheer size of this Area and its importance as the world's largest coral reef ecosystem mean it is a critical global resource. The GBRWHA's size, its economic importance and close proximity to rural and urban populations also means that management must allow for reasonable human use as well as maintenance of its ecological integrity.

The Australian Government coordinates management of the Great Barrier Reef World Heritage Area. While coral reef, mangrove and seagrass habitats occur elsewhere on the planet, no other World Heritage Area contains such a diversity of species and habitats. This makes the Great Barrier Reef one of the world's most extensive and important marine ecosystems (see our brochure: The Great Barrier Reef, Marine Park and World Heritage Areas). For more on World Heritage Areas see: http://www.ea.gov.au/heritage

Why is the GBRWHA special?

Because it contains:

- six of the world's seven species of marine turtle
- the largest green turtle breeding area in the world
- one of the world's most important dugong populations
- a breeding area for humpback and other whale species
- over 3000 km^2 of seagrass meadows
- 2000 km^2 of mangroves including 54% of the world's mangrove diversity
- 2904 coral reefs built from 359 species of hard coral
- 2200 species of native plants which is 25% of Queensland's total native plant species
- more than 1500 species of fish
- 1500 species of sponges equalling 30% of Australia's diversity in sponges
- 800 species of echinoderms (e.g. sea stars) which is 13% of the world's total species
- over 5000 species of molluscs (e.g. shells)
- over one third of all the world's soft coral and sea pen species (80 species)
- spectacular landscapes (e.g. Hinchinbrook Island, the Whitsundays)

The role of representative areas in marine park management

The whole of the Great Barrier Reef Marine Park (GBRMP) offers different degrees of protection for different

habitats within its boundaries. This spectrum of protection ranges from general use areas which allow commercial and recreational activities that include fishing, collecting and trawling to no-take areas that allow access but prohibit all extractive activities to preservation areas that prohibit all forms of access. Furthermore, a multitude of management tools (e.g. zoning, education, permits, management plans) are being used to help achieve ecological and other management objectives.

In recent years there has been a growing realisation that marine park managers should be identifying and protecting representative examples of the diversity of habitats and processes upon which all species depend, rather than focusing on individual species or specific habitats.

A broadscale habitat protection approach can help:

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

Adequate protection of representative areas is widely accepted, in Australia and around the world, as the best way to achieve the objectives listed above. **A representative area is an area that is typical of the surrounding habitats or ecosystem at a chosen scale.** The physical features, oceanographic processes and ecological patterns within a representative area reflect those of the surrounding habitat.

The Authority is entering a new era in marine conservation planning through the introduction of a network of protected representative areas. This representative area network will involve an increase of the area and number of 'no-take' areas (these are the “Green” Zones on Marine Park zoning maps). Green Zones allow of range of activities such as boating, diving, snorkelling and non-extractive tourism activities but prohibit fishing, trawling and collecting.

Although habitats in the World Heritage Area are interconnected and dependent on each other, not all the connections are well understood.

Only relatively recently it was found that corals have a mass spawning event each year and their larvae then disperse via currents.

Scientists have also begun to appreciate the extent and importance of spawning aggregation sites for many fish species.

Given such limits to knowledge, it is important that managers of the Great Barrier Reef World Heritage Area apply the precautionary principle and ensure that representative examples of all habitats are highly protected.

The Representative Areas Program is also being developed against a background of international commitments , strategies and agreements.

Other states in Australia are also contributing to this nation-wide initiative.

Guiding principles for representative areas

Development of GBRMPA's representative areas network is guided by the following principles (adapted from ANZECC, 1998, 'Guidelines for establishing the National Representative System of Marine Protected Areas.' Canberra, Environment Australia).

Regional framework

Representative areas must be chosen in relation to marine regions and habitats and not in relation to themes or species that are high in public profile at any given time, nor in relation to ecosystem features that can change rapidly.

Precautionary principle

Lack of scientific certainty about issues such as exactly where marine protected areas should be located, how large they should be, or how many are needed should not be used as a reason for not establishing a marine representative areas network.

Comprehensiveness

This means including the full range of habitats, recognised at an appropriate scale, encompassing cross-shelf and latitudinal diversity within the GBRWHA. Information about special or unique biological communities, habitats or species (where available), should be used to capture this diversity where possible.

Adequacy

The size and level of protection offered within the representative areas network must safeguard ecological integrity of, and allow sufficient levels of connectivity between populations, species and habitats.

To ensure ecological integrity, the representative areas network will consist of Green Zones (no-take areas) within each different area of biodiversity (known as a bioregion) within the Great Barrier Reef Marine Park.

These Green Zones zones:

- serve as ecological benchmarks where evolutionary processes proceed undisturbed and natural disturbances continue to function.
- provide secure places for marine populations by maintaining genetic, habitat and ecological diversity, and species and population interactions.

Representativeness

The areas included within a representative areas network should reflect the diversity of the habitats from which they are derived.

Consultation

The selection of sites for inclusion in a representative areas network will include effective and high-quality public consultation to address current and future cultural, economic, social and other issues.

Indigenous involvement

Coastal Indigenous peoples, including Traditional Owners, who live adjacent to the GBRWHA have a strong connection, with and dependence upon, their sea country. They also have traditional responsibilities for managing such areas.

The interests and cultural values of Australia's Indigenous peoples will be recognised and incorporated in decision-making.

Decision making

Decision-making processes will integrate long- and short-term cultural, economic, environmental, social and equity considerations in a transparent, comprehensive and consistent manner.

The representative areas process

The Great Barrier Reef Marine Park Authority recognises that the Marine Park is of value to an array of stakeholders, including the public, and input will be sought from all those with an interest in the equitable and ecologically sustainable use and management of the Region.

The representative areas process involves a number of phases as outlined below (see timetable). Communication will occur with stakeholders throughout these phases.

Because all bioregions are not adequately protected then GBRMPA will identify other sites for potential inclusion in the representative areas network.

Beyond the guiding principles, the representative areas process must address practical considerations regarding the identification of biologically feasible candidate sites.

Practical considerations include assessments regarding:

- Size
- Shape
- Level of protection
- Number
- Buffer zones
- Existing highly protected zones
- Location of boundaries
- Anthropogenic threats.

Operational principles covering cultural, ecological, economic, social, legal and practical criteria will be used to select options for areas needing greater protection in the representative areas network. These options are known as candidate areas. The positive and negative aspects of candidate areas will be weighed up against all these operational principles using existing information and expert and stakeholder opinions.

There are likely to be positive and negative social, cultural and economic implications associated with the increase in Green Zones in the Marine Park. This will be an important issue throughout the process, but especially during the selection phase. There will be an emphasis on negotiation with interested parties and stakeholders and all available information on use patterns, economic and social values as well as Indigenous and non-Indigenous cultural values will be taken on board.

The information gained during negotiations with the community will be used to help apply the 'least cost' principle, where 'cost' does not refer just to monetary value. For example, if different configurations of candidate areas satisfy similar biological criteria, the option which imposes most benefit and the least short and long term cost to the community will be adopted.

Practical considerations in the selection process for the Representative Areas Program include legal and institutional issues, such as:

- **ease of recognition** in the field by users and managers alike whether for compliance or enforcement.
- **jurisdictional responsibility**. This is particularly important in coastal, intertidal and nearshore areas where the jurisdictions are not always clear.
- **legislative definition**. For an area to be declared, it has to be described in legislation with detailed boundary descriptions.

Other institutional considerations may include the availability of sufficient resources to implement one representative area option versus another, co-ordination with other agencies and interest groups, efficiency and effectiveness. In particular, this Program complements a similar state-wide program being conducted by Queensland's Environment Protection Authority.

Formal Community Participation

Public participation will be a crucial element of the process and will comprise two formal Community Participation phases and continual informal input. Input will come from the general community plus a broad base of stakeholders including commercial and recreational fishers, conservation groups, Indigenous groups (especially Traditional Owners), the tourism industry, scientists, and Queensland environment and fisheries management agencies. Communication will occur through the media (in all forms), publications, the web, plus an extensive schedule of meetings and presentations with peak bodies, interest groups and consultative groups (e. g. Local Marine Advisory Committees and Reef Advisory Committees).

The Representative Areas Program aims to address the interests and needs of Indigenous and other peoples throughout the process.

Your questions answered

What is a representative area?

A representative area is an area that is typical of its surroundings at some chosen scale. In other words physical features, oceanographic processes and ecological patterns of the representative area reflect those of the surrounding habitat.

Why is biological diversity (or biodiversity) important?

Humans depend on healthy ecosystems which are biologically diverse for food, water and air. They support our economic and social activities and can have cultural or scientific value.

Untapped benefits to humans may exist in the diverse biological resources. These benefits may be medicinal or economic.

Ecosystems that lose some of their biological diversity are weakened and more susceptible to damage from natural and human impacts.

Why is it important to identify and protect representative areas?

In recent years there has been a growing realisation that we should be identifying and protecting representative examples of habitats and ecological processes upon which species depend, rather than putting all our efforts into trying to preserve individual species or specific habitats.

If we can identify representative areas of ecosystems and sufficiently protect adequate examples, then these areas should conserve examples of most, if not all, the species, habitats and ecological processes within the Marine Park.

What is the representative areas approach?

Areas which are representative of all the defined habitats will be included within a network of protected areas including 'no-take' areas. By protecting adequate examples of habitats we are insuring ourselves against the uncertainty which exists due to imperfect knowledge about the marine environment.

Isn’t the whole Great Barrier Reef Marine Park a marine protected area already?

Yes, the entire GBR Marine Park is already a marine protected area. However different levels of protection are provided and different uses are permitted in the different zones.

Why aren’t the existing Green Zones in the Great Barrier Reef Marine Park sufficient?

The current distribution of Green Zones reflects an early focus on:

- coral reef habitats as a priority
- pristine reefs which are located in the remote north
- versus the more heavily used southern parts of the GBRMP.

A more comprehensive network of representative natural areas can help ensure protection of the north/south (latitudinal) and east/west (cross-shelf) diversity of all marine habitats.

Who decided that there should be a review of representative protected areas in the Marine Park?

In 'The 25 Year Strategic Plan for the Great Barrier Reef World Heritage Area' stakeholders made specific recommendations regarding the ‘representative areas’ approach. The Strategic Plan was developed with over 60 organisations and stakeholders. Representatives from all but two of these groups were signatories to the final plan. A review of the representativeness of protected areas within the GBRMP was also recommended in the report titled 'Outstanding Universal Value of the Great Barrier Reef World Heritage Area' (Lucas et al, 1997).

Why not just choose distinctive or special areas for highly protected areas?

This approach assumes we know about all the species and areas which are distinctive or special and assumes that these areas are the most important.

In reality, we know relatively little about marine biodiversity although we do know that commonly occurring but poorly known habitats, such as soft seabed areas, are integral to the functioning of the whole Great Barrier Reef region.

At what scale do we need to classify representative areas in the Great Barrier Reef Region?

The choice of scale is driven by the defined communities and habitats, the kinds of patterns which are important for maintaining connections between these habitats (e.g. migration of fish and prawns) and the appropriateness for management. Given these parameters, representative areas within the GBRMP will be defined at a scale of ‘tens’ of kilometres, particularly in the near-shore and reefal areas. Larger scales may be more appropriate in lagoonal and inter-reefal areas.

What will be achieved by the protection of representative areas which are not adequately protected already?

Green Zones serve three primary functions.

1. They provide secure places for marine populations by maintaining ecosystem, habitat, species, population and genetic diversity; and interactions between ecosystems, habitats, species, populations and genetic pools.
2. They offer relatively 'untouched' areas where organisms can function and evolve in a natural manner and natural disturbance can continue to play its role.
3. They provide natural insurance or a safety net against human-induced disasters and impacts, and imperfect decisions made due to incomplete knowledge

Who determines what should be protected?

The Representative Areas Program has been, and is being, developed jointly with stakeholders, scientists and managers. The statutory zoning process ensures that appropriate levels of community participation occur before any new zone decisions are introduced. No decisions about particular areas will be made without opportunities for involvement and discussions with potentially affected parties.

What will the process involve?

The representative areas process will involve:

- the systematic classification of the distribution of physical and biological marine diversity
- a review of the adequacy of existing Green Zones considering the diversity of habitats and threats to the Great Barrier Reef region
- the identification of a number of candidate representative areas based initially on their capacity to represent the biodiversity of the Marine Park
- selection of candidate areas after consideration of cultural, ecological, social, economic, legal and practical implications
- drafting of a rezoning proposal to accommodate the recommended selected areas.

Will biological information be used to determine representative areas?

Yes, although there is limited biological data over some areas and it would take a huge amount of time and money to complete a comprehensive biological survey of the entire Marine Park. This means that it is necessary to use mainly a physical approach to determining the extent of habitats. The physical data will, however, be supplemented with biological data (where they exist) and the expert opinion of marine biologists.

How can the Representative Areas Program be completed without total biological knowledge?

If we wait for perfect biological knowledge, we will never make a start. GBRMPA is working with the current level of information and such additional information as can be acquired during the next 12 to 18 months. This means GBRMPA is not waiting for the creation of perfect maps that depict all the details of the ocean environment before acting. However, we are using tools and techniques to help understand the link between biological communities and their physical and chemical environments.

Are representative areas the same as unique areas?

No, a representative area is typical of its surroundings at a chosen scale, while a unique (or distinct) area is ‘atypical’ of its surroundings at that scale. Unique areas, such as turtle foraging or fish nursery sites will, however, be considered in the selection phase of the program.

Will there still be Green Zones or other ‘no-take’ zones for reasons other than the representative areas network?

Yes, but they are likely to be small and aimed at protecting local or site-specific values which may be biological, social or cultural.

If more areas are closed to fishing, how will the Authority prevent over-exploitation of remaining open areas?

Through its zoning provisions, GBRMPA controls whether or not fishing and other activities can take place in the various zones of the Marine Park. In the Representative Areas Program, GBRMPA will aim to protect areas which are least used by fishers thus minimising displacement of fishing effort to the remaining open areas. Management of fishing within permitted areas is primarily the role of the Queensland Fisheries Service (QFS) subject to the policies and legislation of the Commonwealth Government. GBRMPA works closely with the QFS to ensure that fishing is sustainable in the Marine Park.

Will existing Green Zones be opened up in exchange for new Green Zones?

It is not the aim of the Representative Areas Program to 'swap' Green Zones around, however such an exchange could be deemed appropriate following an analysis of the degree of representation. Until this analysis is complete, we don't know if it will be desirable or necessary.

What scientific research has been useful so far in the review?

A number of researchers have helped determine what biological, physical and oceanographic factors should be considered in the representative areas review.

Research has also told us about biological patterns of diversity in the Marine Park. For example:

- many species use different habitats at different stages of their lives
- inshore and offshore areas are important and valuable in terms of biodiversity
- the density of species is lower offshore
- there is significant east/west cross-shelf diversity of physical environments and biological communities
- latitudinal differences in species distribution along the length of the entire Great Barrier Reef Region are also important.
- A Scientific Steering Committee meets periodically to assist with the natural science aspects of the Representative Areas Program.

Will the selection of representative areas be based solely on scientific information?

No. Socio-economic, cultural, legal, biological and practical factors will be considered before choosing which candidate areas should be included in the representative areas network.

What other benefits might arise from a representative areas network?

A comprehensive, adequate and representative protected area network within the GBRWHA will help:

- maintain options for future users
- ensure future economic benefits derived from commercial and recreational fishing and tourism by protecting the resource and offering refuge to some fish populations
- increase the size and number of fish

- increase the guarantee that we pass a healthy marine environment on to future generations
- enhance Australia's international status implementing a broadscale, biophysically-based network of comprehensive, representative marine protected areas.

Is the outcome of the representative areas process final and fixed?

No. The representative areas network which is finally proposed in this Program will be reviewed in future years as new data become available. Any review will be tempered with the knowledge that Green Zones must be in place for a reasonable period of time to be effective.

Other Frequently Asked Questions

If you are interested in receiving further information regarding the Representative Areas Program please contact us at the following address and you will be put on our mailing list.

Great Barrier Reef Marine Park Authority
Attention: The Representative Areas Program
P.O. Box 1379
TOWNSVILLE QLD 4810

Ph: 07 4750 0700
1800 990 177

Or email: info@gbrmpa.gov.au

Glossary

ANZECC – Australian and New Zealand Environment and Conservation Council

Authority – the Great Barrier Reef Marine Park Authority

Biodiversity (Biological diversity) – the variety of life forms at the level of ecosystems, species, and gene pools

Bioregion – an area of land and/or water whose limits are defined by the geographical distribution of biophysical attributes and ecological systems

GBR – Great Barrier Reef

GBRMP – Great Barrier Reef Marine Park

GBRMPA – Great Barrier Reef Marine Park Authority

Green Zone – A Green Zone is the locally-known term for a 'no-take' area which, under existing zoning plans, are shown as 'National Park Zones' (or 'Marine National Park 'B' Zones in the older zoning plans). Currently less

than 5% of the Marine Park is in Green Zones.

The term 'marine sanctuary' may sometimes be used to explain the concept to those who know nothing about the Marine Park, but no matter which term is used in the Representative Areas Program, they all mean 'no-take' areas which people can access, and where non-extractive activities like boating, swimming and snorkelling are allowed. All types of fishing, including trawling, and all collecting and extractive activities are prohibited in Green Zones.

Habitat – the place or type of site in which an organism (or group of organisms) naturally occurs

Highly protected area - an area of land and/or sea that prohibits extractive uses, and is protected as far as possible from structures and from activities that pollute or damage habitats (akin to IUCN categories Ia, Ib and II)

IUCN – The World Conservation Union (formerly the International Union for the Conservation of Nature)

IUCN Protected Area Category Ia – Strict Nature Reserve: protected area managed mainly for scientific research or monitoring

IUCN Protected Area Category Ib – Wilderness Area: large area in an unmodified or slightly modified state which is protected and managed so as to preserve its natural condition

IUCN Protected Area Category II – National Park: protected area managed mainly for ecosystem conservation and recreation. These areas provide a foundation for scientific, educational, spiritual, recreational and visitor opportunities all of which must be environmentally and culturally compatible

Marine protected area – an area of sea especially dedicated to the protection and maintenance of biological diversity and of natural and associated cultural resources, and managed through legal or other effective means

Precautionary principle – where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation

Protected area – an area of land and/or sea which is managed in some way to maintain natural, social and/or cultural values (akin to any of the IUCN categories)

Region – an area of land and/or water whose limits are defined by the geographical distribution of physical attributes

Representative area – an area which is typical of its surroundings at some chosen spatial scale. That is, it has similar physical features, oceanographic processes and ecological patterns, and therefore likely to have similar biological communities and/or species.

Related Links

- Environment Australia's Marine Protected Areas Site This

Design Element

The Great Barrier Reef -