APPENDICES

APPENDIX A

Terms of Reference for the Review

Background

The Great Barrier Reef Marine Park Authority (the Authority) was established under the *Great Barrier Reef Marine Park Act 1975* (the GBRMP Act) to manage the Marine Park, advise the Minister in relation to the Marine Park, conduct research and provide educational, advisory and informational services relating to the Marine Park. The Authority consists of a full-time chairman and three part-time members. The staff and chairman of the Authority constitute a statutory authority.

The Government made an election commitment to review the Act to improve the performance of the Authority, its office holders and its accountability frameworks. These terms of reference address the election commitment.

The Government is also conducting a review of corporate governance of all statutory authorities and office holders—the Uhrig review. Mr John Uhrig AC, conducted a review of eight statutory authorities and developed a set of corporate governance principles which are to be applied to all statutory authorities. The Authority is subject to the Uhrig corporate governance principles.

The findings of this review will also inform the implementation of the Uhrig outcomes in relation to the Authority.

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) is the Australian Government's primary legislation for environmental regulation. The review provides an opportunity to examine the GBRMP Act in light of the EPBC Act with a view to modernising the GBRMP Act to ensure consistency between the two Acts.

The review will be chaired by the Secretary of the Department of the Environment and Heritage, Mr David Borthwick, assisted by Ms Barbara Belcher, Department of the Prime Minister and Cabinet and Mr Jonathan Hutson, Department of Finance and Administration, reporting to the Minister for the Environment and Heritage, Senator the Hon Ian Campbell.

Public submissions are invited, with a closing date of 30 September 2005.

Scope of the Review

1. The review will focus on:
   - the role of office holders;
   - the functions of the Authority;
   - accountability frameworks; and
   - consultation mechanisms.
2. The review will provide advice, in light of the Uhrig principles, on:
   - the appropriateness of current arrangements;
   - the efficiency and effectiveness of current consultation mechanisms;
   - any changes to improve the corporate governance arrangements of the Authority;
   - any adjustment of the function of the Authority;
   - improving consistency between the GBRMP Act and the EPBC Act; and
   - any legislative amendments required to make such changes.

APPENDIX B

The Review secretariat

Department of the Environment and Heritage

Dr Diana Wright, First Assistant Secretary

Ms Bettina Söderbaum

Mr Travis Bover

Ms Claire Howlett

APPENDIX C

Public submissions to the Review

M Fellows
Grace
L Teitzel, Lucinda Lures
R Lowden
Simon Coolican, Cairns Seafood Marketing Agency
W Starck
R Aiello, Ecotourism consultant
B Leptig
M Gerhardt
Dr Don Kinsey AM
B Harvey
Association of Marine Park Tourism Operators
Mission Beach Marine Advisory Committee
M&W Williams
B Scott
P Bowman, Bunker Fisheries
Queensland Seafood Marketers' Association
J Naylor
R Baker
N Hanke
P Todd, Aqua-Cat Charters
G Matthews
Wildlife Protection Association of Australia
D Tarte
A McIver
K Kristensen
R Moore
J Wolstenholme
A&J Holland
J Beu
C McFarlane
T Charters
Ecotourism Australia
J Maddams
J Crawford
M&B Buckingham, Siren Seafoods
K Sampson
M McCormick, James Cook University
W Williams
J Leis
F Wood
P Rixon
I Spadbrow
K&J Harris

Sunfish Tablelands Branch
A Dunstan
Professor FH Talbot (Macquarie University)
A&P Bradshaw
National Parks Association of Queensland
Great Barrier Reef Marine Park Authority
I McCallan
Australian Coral Reef Society
S Bullock
Mayor Giandomenico (Hinchinbrook Shire)
K Kavanagh
Australian Museum
K Martin
Environmental Defenders' Office
Williamson
Bundaberg Skindivers Club
P Wright
C McGrath
Great Barrier Reef Research Foundation
M Gardner
World Wildlife Fund
P Filmer-Sankey
M Rowell MP (State Member for Hinchinbrook)
GWP Little, Buck's Seafood
G Winsen
JB Sheldon
D Robinson
T Baker, Quicksilver
Australian Government Department of Defence
Great Barrier Reef Tuna
W Bayne, Mitchell's Marine
T McLean, Boat Scene Pty Ltd
M Clink, Boat Scene Pty Ltd
M Willis and D Turcotte
DA Pope (QSIA Branch 10 Chairman)
Senator the Hon R Boswell
Cape York Marine Advisory Group
L Burke
K Thomas, Big Cat Green Island Cruises
RH Ellis
Sunfish North Queensland
Pew Fellows in Marine Conservation (x20)
Campaign Submission - Australian Marine Conservation Society
Campaign Submission - Australian Marine Park Tourism Operators members
Campaign Submission - World Wildlife Fund
Campaign Submission - Day tour visitors
Campaign Submission - Dive Queensland employees
P&M Loveday, Loveday Fisheries
J Neville

B Lee
M Dengate
J Olsen
P Sutton, Torres Pilots Pty Ltd
P Waters
Australian Institute for Marine Science
Queensland Yacht Charters
Community for Coastal and Cassowary Conservation
R Hansen
J Baker, Chief Scientific Adviser, QDPI&F
M&R Millward
J Thomas
G Nairn, Great Barrier Reef Cruises
Queensland Seafood Industry Association
M Goldie, Explorer Ventures
Futureye
P&P Pike
R de Vries
R Erskine, Erskine Tackle Shop
National Parks Australia Council
Queensland Tourism Industry Council
D Reid
R Kelley
R Pears
E Dinsdale
C Boland
B Danastas
C Stephen, Mike Ball Dive Expeditions
Australian Underwater Federation
Cod Hole and Ribbon Reef Operators Association
B Mapstone
National Parks Association of NSW
J Saverin & K Guthrie, Oaksea Pty Ltd
Conservation Councils - Qld, WA, South-East Region and Canberra and Tasmania
P Doherty
G Scott
Gecko - Gold Coast and Hinterland Environment Council
S Woodley (Conservation RAC)
Prof H Marsh (JCU)
Prof T Hughes, ARC Centre for Excellence for Coral Reef Studies
T Ward
Ecofish
A Harvey, CEO, Shire of Hinchinbrook
GPT Management Holdings, T Jonsson
P Fischer, Taka Dive Adventures
C Smalley
Whitsunday Bareboat Operators Association
G Unicomb
J Millward, Sunlover Cruises

The Fishing Party
R Babcock
A Hay
G Hunt, Synergy Reef Sailing
Queensland Conservation Councils
P Mather AO (Qld Museum)
Associate Professor B Willis (James Cook University)
G Hunt, Voyages Hotels and Resorts
A Cousland
B McNeven
B Kennedy, SOS Burdekin
The Nature Conservancy
Tourism Tropical North Queensland
Nature Conservation Council of NSW
Associate Professor G Russ (James Cook University)
Australian Marine Conservation Society
M Burns
O Hoegh-Guldberg, Centre for Marine Science, University of Queensland
St Helens Bush and Beach Association
P Holmes, Javelin Boats
The Whitsunday Crew
Eastern Pelagic Fishing Group
R Anderson, M&G Stevenson, QSIA Branch 14
Australian Marine Sciences Association
Association of Marie Park Tourism Operators - Southern Group
N Williams
M Crimp, Indian Pacific Pearls
R Lacco, Opal Marine
W Robinson, Schulz Fisheries
The Wilderness Society
Magnetic Island Community Development Association
M Mansfield
V Lukoschek
M Creta
J Foley, Nairana Pty Ltd
J Davidson
RW Bennett
A Griggs
N Green
D Lewis
Whitsunday Charter Boat Industry Association
P Carden
B Barnett, Tyto Consulting
B Cunningham
D Glasson
R&L Gibson
Wildlife Preservation Society of Qld
Australian Maritime Safety Authority
M Gardner

J&W Wintour
D Wintour
O Komsic
S Waring, Tusa Dive
R Reichelt
Queensland Government
Tourism and Transport Australia
Ocean Watch
Queensland Aquaculture Industries Federation
Wildlife Preservation Society of Australia
Bluefin Seafoods Pty Ltd
Captain Cook Cruises
Diversion Dive Travel
Hassan Family Trust
Johnstone Ecological Society
Shipping Australia Ltd
Professor B Moulden (Vice-Chancellor, James Cook University)
B Gamlim
R Elmer
Townsville Enterprise
N Dawson
S Hanson, ABIT Pty Ltd
R Kenchington
T Fontes
Sunfish Queensland
H Burgess
P Boundy
CA Mitchell
A Welk
Mackay Local Marine Advisory Committee
J Thorogood
Australian Conservation Foundation
Far North Queensland Natural Resources Management
The Hon Warren Entsch MP
RS Earle
Burnett Marine Advisory Committee
Australian Government Department of Industry, Tourism and Resources

APPENDIX D

Consultation meetings held as part of the Review

Reef Advisory Committees

- Mr Peter Frawley, Chair, Tourism and Recreation Reef Advisory Committee
- Ms Diane Tarte, Chair, Fisheries Reef Advisory Committee
- Mr Noel Dawson, Chair, Water Quality Reef Advisory Committee
- Mr Simon Woodley, Conservation Reef Advisory Committee

Local Marine Advisory Committees (LMACs)

- Mr Peter Wright, Acting Chair and Mr Paul Freeman, Secretary, Douglas LMAC
- Mr Bob Rossi, Chair and Mr Tim Anderson, Deputy Chair, Cairns LMAC
- Mr Bill Shannon, Chair and Mr Dave Nissen, Member, Mission Beach LMAC
- Mr Bill Whiteman, Chair and Mr David Perkins, Member, Hinchinbrook LMAC
- Mr Steve McGuire, Chair and Ms Lisa Gershwin, Member, Townsville LMAC
- Mr Tony Fontes, Chair, Whitsunday LMAC
- Mr Les Todd, Member and Mr Joe Patterson, Member, Mackay LMAC
- Mr Graham Scott, Chair, Capricorn Coast LMAC
- Mr Warwick Sheldon, Chair and Ms Anna Hitchcock, Member, Gladstone LMAC
- Mr Ray Duffy, Chair and Mr Ray Heale, Member, Burnett LMAC
- Mr Ian McCollum, Chair, Cape York Marine Advisory Group

Commercial fishing

- Mr John Olsen, Ms Karin Schiller, Mr Neil Green, Mr Martin Bowerman, Mr Tor Hundloe, Queensland Seafood Industry Association
- Mr Lyle Squire, Mr Rob Lowden, Mr Shaun Hanson, Mr Gary Wicks, Ms Anne English, Mr Denis Ballam, Ecofish

Seafood processing and marketing

- Mr Jim Fogarty, Mr Peter Packman, Mr Sid McKeown, Mr Ted Whittingham, Mr Graham Carraciolo and Mr Martin Perkins, Queensland Seafood Marketers' Association

Recreational fishing

- Mr Bill Turner and Mr David Bateman, Sunfish Queensland
- Mr Brian Pickup, Ms Cheryl Picker, Mr Arthur Dobe and Mr Brad Baker, Sunfish North Queensland
- Mr Kevin Collins, Mr Wayne Bayne and Mr Alex Witten, The Fishing Party Queensland

Tourism organisations

- Mr Daniel Gschwind, Queensland Tourism Industry Council
- Mr Col McKenzie and Mr David Hutchen, Association of Marine Park Tourism Operators
- Mr Peter Boundy, Dive Queensland

Queensland Government

- Dr Leo Keliher, Ms Liz Young and Ms Andrea Leverington, Queensland Department of Premier & Cabinet

Conservation organisations

- Mr Ray Nias and Mr Richard Leck, World Wildlife Fund
- Ms Kate Davey, Australian Marine Conservation Society

Research and academic organisations

- Dr Russell Reichelt, Cooperative Research Centre for the Great Barrier Reef World Heritage Area
- Professor Helene Marsh, James Cook University
- Dr Ian Poiner, Australian Institute of Marine Science
- Professor Michael Kingsford, Australian Coral Reef Society
- Professor Richard Kenchington, Centre for Maritime Policy, University of Wollongong

Great Barrier Reef Marine Park Authority

- Hon. Virginia Chadwick, Mr Terry Wall, Dr Evelyn Scott and Ms Fay Barker, Great Barrier Reef Marine Park Authority members
- Hon. Virginia Chadwick, Mr Andrew Skeat and Mr John Tanzer, Great Barrier Reef Marine Park Authority Executive Management Team

Shipping and ports

- Mr Barry Holden and Mr Larry Hore, Townsville Port Authority
- Mr Clive Davidson, Chief Executive Officer, Australian Maritime Safety Authority

Federal Parliamentarians

- The Hon Warren Entsch MP, Member for Leichhardt
- Senator the Hon Ron Boswell
- The Hon De-Anne Kelly MP, Member for Dawson
- Mr Peter Lindsay MP, Member for Herbert
- Senator Barnaby Joyce
- Senator the Hon Ian Macdonald
- Mr Paul Neville MP, Member for Hinkler
- Senator Nigel Scullion

Other

- Dr Wendy Craik, Chief Executive Officer, Murray–Darling Basin Commission
- Mr Geoff Gorrie, former Deputy Secretary, Department of Agriculture, Fisheries and Forestry

APPENDIX E

The Emerald Agreement of 1979

The Great Barrier Reef

The basic idea is to secure agreement on the main elements of a negotiation on the basis that the *Great Barrier Reef Marine Park Act [1975]* the Region remain unchanged.

The negotiating scenario

1. *Establishment of a Queensland-Commonwealth Council on the Great Barrier Reef Region*

   It is recommended that a Council of four Ministers (two from each side) representing tourism, marine parks, science and environment, be established under an exchange of letters between the Premier and the Prime Minister. The Council would include in its functions the processing of recommendations to Governments by the Barrier Reef Authority. The Council would be convened by the Commonwealth at the request of either party. Note: Ministers responsible for mining would not be members of the Council.

2. *The Capricornia Section*

   It is envisaged that the Capricornia section will be the first area to be considered for declaration as a marine park, and the Council will take early steps to address this matter.

3. *Management of the Marine Park within the Region*

   The Act provides for the Authority to make arrangements with the State for the management of any declared marine park. It is recommended that subject to the Authority Queensland be assigned the day-to-day management role and that the necessary preparatory steps to be taken for arrangements to be put in place, on a basis to be agreed by the Ministerial Council.

4. *Territorial Seas in the Region*

   The legal arrangements for the implementation of the Premiers' Conference decision on Seas and Submerged Lands be subject to the following:

   a) the *Great Barrier Reef Marine Park Act [1975]* and the boundaries of the Great Barrier Reef Region to remain unchanged;

   b) the Prime Minister's statement of 4 June 1979 concerning the Great Barrier Reef;

   c) the day-to-day management to be undertaken by officers of the Queensland National Parks and Wildlife Service, who, in discharging these responsibilities, will be subject to the Great Barrier Reef Marine Park Authority;

   d) relevant State legislation to be brought into line with the *Great Barrier Reef Marine Park Act [1975]*.

5. Subject to the above, the arrangements with Queensland in relation to the territorial sea which will flow from the agreements of the June 1978 Premiers' Conference will be on the same basis as the arrangements to be entered into in respect of other States.

6. *Scientific Research*

   The Ministerial Council would be asked to endorse and monitor the progress of the proposed programs of scientific research in the Barrier Reef region and to ensure that it be established on a timetable and framework acceptable to both Governments.

7. *Joint Press Statement*

   As a first step in the implementation of these co-operative arrangements it is proposed that a joint press statement should be issued along the lines of the draft attached.

APPENDIX F

Legislation, Regulations and conventions relevant to management of the Great Barrier Reef

Commonwealth legislation and Regulations

Great Barrier Reef Marine Park Act 1975

Great Barrier Reef Marine Park (Environmental Management Charge-Excise) Act 1993

Great Barrier Reef Marine Park (Environmental Management Charge-General) Act 1993

Great Barrier Reef Marine Park Regulations 1983

Great Barrier Reef Region (Prohibition of Mining) Regulations 1999

Great Barrier Reef Marine Park (Aquaculture) Regulations 2000

Environment Protection and Biodiversity Conservation Act 1999

Environment Protection (Sea Dumping) Act 1981

Historic Shipwrecks Act 1976

Protection of the Sea (Prevention of Pollution from Ships) Act 1983

Sea Installations Act 1987

Queensland legislation

Marine Parks Act 1982

Marine Parks Act 2004

Environmental Protection Act 1994

Fisheries Act 1994

Coastal Protection and Management Act 1995

Integrated Planning Act 1997

Native Title (Queensland) Act 1993

Nature Conservation Act 1992

Transport Operations (Marine Pollution) Act 1995

Transport Operations (Marine Safety) Act 1994

International conventions

Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972

Convention on Biological Diversity, 1992

Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973

Convention on the Conservation of Migratory Species of Wild Animals, 1979

Convention on Wetlands of International Importance Especially as Waterfowl Habitats, 1971

Convention for the Prevention of Pollution from Ships, 1973

United Nations Convention on the Law of the Sea, 1982

United Nations Framework Convention on Climate Change, 1992

APPENDIX G

Government agencies of relevance to management of the Marine Park

As at August 2006

Australian Government agencies

- Department of Families, Community Services and Indigenous Affairs
- Australian Customs Service
- Australian Fisheries Management Authority
- Australian Institute of Marine Science
- Australian Maritime Safety Authority
- Australian Quarantine and Inspection Service
- Commonwealth Scientific and Industrial Research Organisation
- Department of Defence
- Department of Industry, Tourism and Resources
- Department of the Environment and Heritage

Queensland Government agencies

- Department of Local Government, Planning, Sport and Recreation
- Department of Natural Resources, Mines and Water
- Department of State Development, Trade and Innovation
- Education Queensland
- Queensland Department of Primary Industries and Fisheries
- Environmental Protection Agency/Queensland Parks and Wildlife Service
- Queensland Transport
- Tourism Queensland

APPENDIX H

Biophysical Operational Principles for the Representative Areas Programme

As recommended by the Scientific Steering Committee for the Representative Areas Programme

The Scientific Steering Committee

The independent Scientific Steering Committee (SSC) to the Representative Areas Programme (RAP) provides advice on scientific issues, programming and priorities to assist the Great Barrier Reef Marine Park Authority (GBRMPA) to achieve the best possible outcomes. The membership of RAP's SSC was decided by the GBRMPA after consultation with over 70 of Australia's top scientists with expertise in the GBR region.

Background and context for these recommendations

The SSC believes that the existing network of Green Zones (no-take areas)[23] in the Great Barrier Reef Marine Park (GBRMP) is insufficient to maintain the biological diversity and ecological integrity of the Great Barrier Reef (GBR) into the future. The reasons are that:

- less than 5 per cent of the Marine Park is currently in no-take areas;
- the existing areas are largely confined to coral reefs or the remote far north of the Marine Park; and
- the coverage of no-take areas in many of the 70 bioregions in the Great Barrier Reef World Heritage Area (GBRWHA) is minimal or non-existent.

The GBRMPA shares this concern and is rezoning the entire Marine Park through RAP. This rezoning will result in more no-take areas that will help:

- maintain biological diversity at the levels of ecosystem, habitat, species, population and genes;
- 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; and
- maintain ecological processes and systems.

As part of the RAP, new no-take areas or Green Zones will be created and existing Green Zones may be expanded to achieve greater protection of biodiversity. The existing range of multiple-use zones will remain (ranging from 'General Use Zones' where most reasonable activities are allowed, through the new 'National Park Zones' [also known as Green Zones or 'no-take' areas], to small areas of 'Preservation Zone' which are 'no-go' areas).

23 Green Zones (no-take areas) within the GBR Marine Park are equivalent to the existing 'National Park Zones' (Cairns & Far North Sections) and 'Marine National Park B Zones' (Central & Mackay-Capricorn Sections) in which activities such as boating, diving and snorkelling are permitted, but the taking of plants, animals and marine products is prohibited.

The Representative Areas Programme has several phases:

- **classification** – map the marine diversity in the Great Barrier Reef World Heritage Area into bioregions;
- **review** – determine the **extent** to which the existing zoning protects the biodiversity shown by the bioregions;
- **identification** – identify networks of candidate areas which will achieve the biological objectives of RAP; and
- **selection** – select from amongst **the** options of candidate areas to maximise beneficial and minimise detrimental impacts whilst considering social, economic, cultural and management implications (Day et al, in press).

Origin and justification of the biophysical operational principles

The following biophysical operational principles are recommended by the SSC to guide the establishment of a new network of no-take areas that could achieve the objectives of RAP. These principles will guide reserve design processes in RAP. The SSC recognises that other processes in RAP will address the cultural, social and economic dimensions of the programme and that these may influence the degree to which the GBRMPA is able to achieve, in full, its recommendations. An independent Social, Economic and Cultural Steering Committee has developed operational principles for assessing social, economic, cultural impacts and management feasibility that complement the biophysical operational principles.

The biophysical operational principles outlined below were established by the SSC by taking into account:

- the level of uncertainty about the biodiversity of the GBR World Heritage Area;
- the fact there is already a basic level of protection across the GBR Marine Park; and
- other efforts to ensure protection of the GBR Marine Park by improvements in, for example, water quality and sustainable fishing.

Amount of protection required

The extent of protection required to ensure the ongoing conservation and protection of marine biodiversity is a subject of debate in the scientific literature. Amounts recommended in the literature generally fall in the range of 20 – 40% of the sea in no-take areas. The scientific arguments for setting aside substantial amounts of the marine environment as no-take areas include:

- **Risk minimisation** – protecting a large proportion and replicate examples of a marine area – in total 20% or more – will reduce risks of over-exploitation of harvested resources and consequent effects on the ecosystem, whilst leaving reasonable opportunity for existing activities to continue in the remaining areas;
- **Connectivity** – the life cycles of most marine organisms mean that offspring from one area often replenish populations in other areas (referred to as 'connectivity'). As more areas are closed to extractive activities, the benefits to the whole system through such connectivity (both among reserves and between reserves and non-reserves) is expected to increase, thereby offering greater security for conservation;
- **Resilience against human and natural catastrophes** – for any one disturbance, much of the network of protected areas should remain intact so that affected areas can recover more quickly and completely through replenishment from other non-impacted no-take areas;
- **Harvested species** – the protection of 20 – 40% of any fished grounds in no-take areas offers some fisheries the opportunity for better management, and permits no-take areas to maintain more natural population levels of harvested species and, consequently, more natural communities as a whole; and

- **Maintenance of ecological services and goods** – in no-take areas, ecosystems can function in a more natural manner which contributes to maintenance of ecological processes. This leads to more sustainable delivery of ecological goods and services to both the environment and humans.

The SSC is aware of the literature on theoretical and empirical evidence for levels of protection. Their considerations have been supported by independent advice from other experts in coral reef and non-reef ecosystems, and experts with technical knowledge about the design of protected area networks.
The SSC recognises:

- national and international expectations associated with managing the world's largest coral reef ecosystem and the world's largest World Heritage Area in a developed country; and
- international experience and opinion advocating greater protection of the world's oceans.

The percentages presented in these recommendations have been developed using best available knowledge of the GBR World Heritage Area system and general principles of reserve design. Despite this, detailed knowledge about the distribution of many plants and animals in the area is limited and the SSC recognises that many species are yet to be discovered. The SSC considers that species-specific information is insufficient to determine exact amounts of protection required for the whole ecosystem and that all knowledge gathered to date indicates that the protection of biodiversity requires much more than protection of particular species and a much greater extent of protection than currently exists in the GBRMP.

The percentage figures presented in the biophysical operational principles were developed using all available information and local knowledge/experience of the GBR World Heritage Area and recognition that requirements vary with areas and habitats. The final percentage protection recommended per bioregion is the outcome of implementing all the principles below including principles 5 and 6 (which refer to each bioregion) and principles referring to specific levels of protection for different habitats, communities and special and unique areas. The SSC also was mindful of the need for a precautionary approach to the protection of the unique biophysical properties of the GBRMP when recommending minimum amounts for no-take areas.

The biophysical operational principles should be treated as a package to underpin the choice of what number, size and location of no-take areas to implement. If these principles are implemented in full, the SSC expects that around 25-30% of the GBRMP will be protected in Green Zones or no-take areas – in some locations more and others less so.[24] These biophysical operational principles refer to minimum amounts of protection. The SSC considers that to achieve the objectives of RAP the GBRMPA should protect at least these amounts in each bioregion and each habitat – none of these recommendations are for 'ideal' or 'desired' amounts. Ideal or desired amounts required for full protection are likely to be greater than indicated by the biophysical operational principles.

The SSC realizes that there are many different spatial configurations of no-take areas that would fulfil these biophysical operational principles and that the final location of no-take areas will be decided in consultation with Traditional Owners, users and other stakeholders.

The SSC considers that the biophysical operational principles are best estimates of the requirements to provide minimum protection through declaration of no-take areas (Green Zones), available literature and expert knowledge, and are based upon current knowledge of the system but may require review as new information becomes available.

24 More new no-take zones will be located over non-reef areas than reef areas because 21 per cent of reef area is already in no-take zones.

Biophysical operational principles recommended by the SSC

Principle	Explanation
1. Have no-take areas the minimum size of which is 20km along the smallest dimension (except for coastal bioregions, refer to Principle 6)	While no-take areas may be of various shapes and sizes, 20km should be the minimum distance across any no-take area in order to ensure that the size of each area is adequate to provide for the maintenance of populations of plants and animals within Green Zones and to insure against edge effects resulting from use of the surrounding areas.
2. Have larger (versus smaller) no-take areas	For the same amount of area to be protected, protect fewer, larger areas rather than more smaller areas, particularly to minimise 'edge effects' resulting from use of the surrounding areas. This principle must be implemented in conjunction with principle 3.
3. Have sufficient no-take areas to insure against negative impacts on some part of a bioregion	'Sufficient' refers to the amount and configuration of no-take areas and may be different for each bioregion depending on its characteristics. For most bioregions, 3-4 no-take areas are recommended to spread the risk against negative human impacts affecting all Green Zones within a bioregion. For some very small bioregions fewer areas are recommended, whilst for some very large or long bioregions, more no-take areas are recommended.
4. Where a reef is incorporated into no-take zones, the whole reef should be included	Reefs are relatively integral biological units with a high level of connectivity among habitats within them. Accordingly, reefs should not be subject to 'split zoning' so that parts of a reef are 'no-take' and other parts are not.
5. Represent a minimum amount of each reef bioregion in no-take areas	In each reef bioregion, protect at least 3 reefs with at least 20% of reef area and reef perimeter[25] included in no-take areas. The number and distribution of no-take areas is described in principle 3.
6. Represent a minimum amount of each non-reef bioregion in no-take areas	In each non-reef bioregion, protect at least 20% of area. Two coastal bioregions,[26] which contain finer scale patterns of diversity due to bays, adjacent terrestrial habitat and rivers require special provisions. The number and distribution of no-take areas is described in principle 3.
7. Represent cross-shelf and latitudinal diversity in the network of no-take areas	Many processes create latitudinal and longitudinal (cross-shelf) differences in habitats and communities within the GBR World Heritage Area. This diversity is reflected partly in the distribution of the bioregions, but care should be taken to choose no-take areas that include differences in community types and habitats that cover wide latitudinal or cross-shelf ranges (see principle 8).

continued over page

25 These bioregions are excepted:
- Capricorn-Bunker Mid-Shelf Reefs (RCB2) – include one of the inner 2 and one of the outer 2 reefs. This exception exists because RCB2 has only 4 reefs;
- Deltaic Reefs (RA1) – minimum 25% and minimum 15 reefs in one continuous area. This exception exists because the bioregion is too small for multiple no-take areas;
- High Continental Island Reefs (RHC) – 20% of reef perimeter only. This exception exists because reef perimeter makes more biological sense for fringing reefs; and
- Central Open Lagoon Reefs (RF2) – 3 reefs. There are very few reefs in this bioregion.

26 For coastal bioregions:
- Coastal Strip-Sand (NA1) – protect at least six no-take areas, each at least 10 km in length, spaced approximately every 70-100 km apart. (This bioregion is approx. 800 km long); and
- High Nutrient Coastal Strip (NA3) – at least eight no-take areas, each at least 10 km in length, spaced approximately every 70-100 km apart. (This bioregion is approximately 1400 km long).

Biophysical operational principles recommended by the SSC (continued)

Principle	Explanation
8. Represent a minimum amount of each community type and physical environment type in the overall network taking into account principle 7[27]	This principle is to ensure that all known communities and habitats that exist within bioregions are included in the network of no-take areas. Communities and habitats were identified for protection in no-take areas based upon the reliability and comprehensiveness of available data. The requirements listed in Footnote 5 help implement this principle, which is intended to ensure that particularly important habitats are adequately represented in the network of no-take areas.
9. Maximise use of environmental information to determine the configuration of no-take areas to form viable networks	The network of areas should accommodate what is known about migration patterns, currents and connectivity among habitats. The spatial configurations required to accommodate these processes are not well known and expert review of candidate networks of areas will be required to implement this principle.
10. Include biophysically special/unique places	These places might not otherwise be included in the network but will help ensure the network is comprehensive and adequate to protect biodiversity and the known special or unique areas in the GBRMP. Aim to capture as many biophysically special or unique places as possible.
11. Include consideration of sea and adjacent land uses in determining no-take areas	Past and present uses may have influenced the integrity of the biological communities and the GBRMPA should consider these effects, where known, when choosing the location of no-take areas. For example, existing no-take areas and areas adjacent to terrestrial National Parks are likely to have greater biological integrity than areas that have been used heavily for resource exploitation.

27 Data and objectives to implement principle 8:
- Halimeda beds – ensure no-take areas represent 10% of known Halimeda beds;
- shallow water seagrass – ensure no-take areas represent 10% of shallow water seagrass habitat;
- deepwater seagrass – ensure no-take areas represent 10% of known deepwater seagrass habitat;
- algae – ensure no-take areas represent 10% of known algal habitat;
- epibenthos – ensure no-take areas represent different faunal classes (5% each of echinodermata, sponges, bryozoans, solitary corals, soft corals, foraminifera, brachyura);
- dugong – ensure no-take areas represent identified dugong habitat areas summing to about 50% of all high priority dugong habitat;
- cays – where cays exist within a bioregion, try to include at least two examples of them in potential no-take areas;
- reefs size - capture 5% of reef area in each of five reef-size classes;
- inter-reef channels - capture at least one inter-reef channel in bioregions where they exist;
- exposure - ensure the entire network captures 5% of reef and non-reef area in each of five wave exposure classes;
- islands – where islands exist within a bioregion try to include one example of them in no-take areas;
- oceanographic diversity in water quality – ensure representation of reefs within the 'natural' diversity of water quality (5% of reef and non-reef area in each of nine oceanographic 'bioregions'; 5% of reef and non-reef area in each of four flood frequency classes);
- adjacent coastal and estuarine habitats (including islands) – locate no-take areas adjacent to mangroves, wetlands and protected areas rather than adjacent to suburbs; and
- major turtle sites – ensure no-take areas include known major turtle nesting and foraging sites (100% of about 30 sites of the 115 identified – these include both nesting sites and foraging sites).

APPENDIX I

Selected scientific studies on the establishment of 'no-take' areas in Marine Protected Areas available at the time of the Representative Areas Programme

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APPENDIX J

Economic, social, cultural and management feasibility operational principles for the Representative Areas Programme

As part of the zoning review to implement the Representative Areas Programme, two independent steering committees were formed to provide expert advice to the GBRMPA about the:

- biological and physical aspects of the Great Barrier Reef Region; and
- social, economic, cultural and management feasibility aspects of human use and values of the Marine Park.

The selection of new no-take areas will be guided by the operational principles developed by both these committees. These principles will help protect biodiversity whilst maximising beneficial and minimising detrimental impacts to local communities and stakeholders.

A summary of the social, economic, cultural and management feasibility operational principles developed by the Social, Economic and Cultural Steering Committee is given below. These will apply, as far as possible, to the Representative Areas Programme. Another technical information sheet is available detailing the biophysical operational principles.

Operational principles

Principle	Explanation
1. Maximise complementarity of no-take areas with human values, activities and opportunities	This is achieved by placing Green Zones (or no-take areas) in locations that: • have been identified through a consultative process that is participatory, balanced, open and transparent; • Traditional Owners have identified as important and in need of high levels of protection; • minimise conflict with Indigenous people's aspirations for their sea country; • protect areas that the community identifies as special or unique, e.g. places of biological, cultural, aesthetic, historic, physical, social or scientific value; • minimise conflict with non-commercial extractive users such as recreational fishers; • minimise conflict with commercial extractive users; and • minimise conflict with all non-extractive users.
2. Ensure that final selection of no-take areas recognises social costs and benefits	This will include recognition of the following: • relative social costs and benefits, including community resilience; • spatial equity of opportunity within and between communities, including clan estates; • planned and approved future activities; and • consider requirements for monitoring the effectiveness of the zoning plans.

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Operational principles (continued)

Principle	Explanation
3. Maximise placement of no-take areas in locations which complement and include present and future management and tenure arrangements	These arrangements include the following: • existing or proposed zoning plans, management plans or other related management strategies for marine areas by federal, state or local government authorities; • existing or proposed tenure and management strategies for coastal areas (mainland and islands) in the region; and • Native Title claim areas and issues.
4. Maximise public understanding and acceptance of no-take areas, and facilitate enforcement of no-take areas	This is achieved by: • having Green Zones that are simple shapes; • having Green Zones with boundaries that are easily identified; and • having fewer and larger Green Zones rather than more and smaller Green Zones.