



Australian Government
Director of National Parks

Elizabeth and Middleton Reefs Marine National Nature Reserve



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Elizabeth and Middleton Reefs Marine National Nature Reserve



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Director of National Parks 2006

*This is the second management plan
prepared for the Elizabeth and Middleton Reefs
Marine National Nature Reserve*

Note: Even though the Elizabeth and Middleton Reefs are called reefs,
they are in fact islands with a surrounding coral reef.



Australian Government
Director of National Parks

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Black cod *Epinephelus daemeli* - David Harasti

Wreck of the Runic - Department of the Environment and Heritage

Sea urchins and coral reef – Kate Osborne, Australian Institute of Marine Science

Elizabeth Reef - Mark Hallam, Department of the Environment and Heritage

Main Image:

Middleton Reef, composite aerial photo - Australian Institute of Marine Science

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Foreword

The Elizabeth and Middleton Reefs Marine National Nature Reserve (the 'Reserve') was declared on 23 December 1987 by proclamation under the *National Parks and Wildlife Conservation Act 1975*. It is now protected and managed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This second Management Plan for the Reserve (the Plan) has been drafted by staff of the Department of the Environment and Heritage on behalf of the Director of National Parks in consultation with interested groups and individuals. The Plan takes into account public comments received in response to the initial invitation to comment in October 2002 and on the draft Plan issued in August 2005.

The Reserve is part of the National Representative System of Marine Protected Areas (NRSMPA). The primary goal of the NRSMPA is to establish and manage a comprehensive, adequate and representative system of marine protected areas in order to contribute to the long-term ecological viability of marine ecosystems, and maintain ecological processes to protect Australia's biological diversity at all levels.

The Plan has been prepared in accordance with the EPBC Act. As required by the Act, the Plan assigns an Australian IUCN (World Conservation Union) category to the Reserve. The category assigned to the Reserve is 'strict nature reserve' to be managed primarily in accordance with the Australian IUCN reserve management principles prescribed by the regulations under the EPBC Act. The Plan provides for the protection and conservation of the Reserve and states how the Reserve will be managed.

This Plan divides the Reserve into two zones. A highly protected 'Sanctuary Zone' around and to the south of Middleton Reef will be managed for research and monitoring and appropriate public access (visitors may access this zone but no fishing of any kind will be allowed). The waters around Elizabeth Reef will be managed as a 'Habitat Protection Zone' for research, monitoring and recreational access and fishing. To access this zone or to carry out recreational fishing, a permit under the EPBC Act will be required. Permits

will be available on Lord Howe Island and will be issued for the duration of the Plan. Permit holders will be required to provide a brief report on their uses and activities in the reserve following each visit. Recreational fishing will also be subject to New South Wales fishing regulations, including fishing methods, size and bag limits and protected species.

The Plan recognises the long-standing relationship between the Lord Howe Island community and the Reserve - Elizabeth Reef in particular. The Plan provides for ongoing access - now and in the future. It acknowledges the importance of working cooperatively with the community and the valuable stewardship role that the community has taken on to help protect the conservation values of the Reefs.

The Plan also describes the conservation and cultural values of the Reserve, the pressures on these values, and a detailed management regime to ensure these values are protected. A framework is provided for compliance and enforcement of regulations and to assess management effectiveness.

The Plan, as for all management plans for a Commonwealth reserve, has effect for seven years, unless revoked or amended earlier by another management plan. The Plan may only be altered following the same statutory and consultative process used in its preparation.

Stephen Oxley
Assistant Secretary
Marine Conservation Branch

Department of the Environment and Heritage
Delegate of the Director of National Parks

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Part 1: Introduction

1.0 Establishment and previous management

1.1 Proclamation of the Reserve

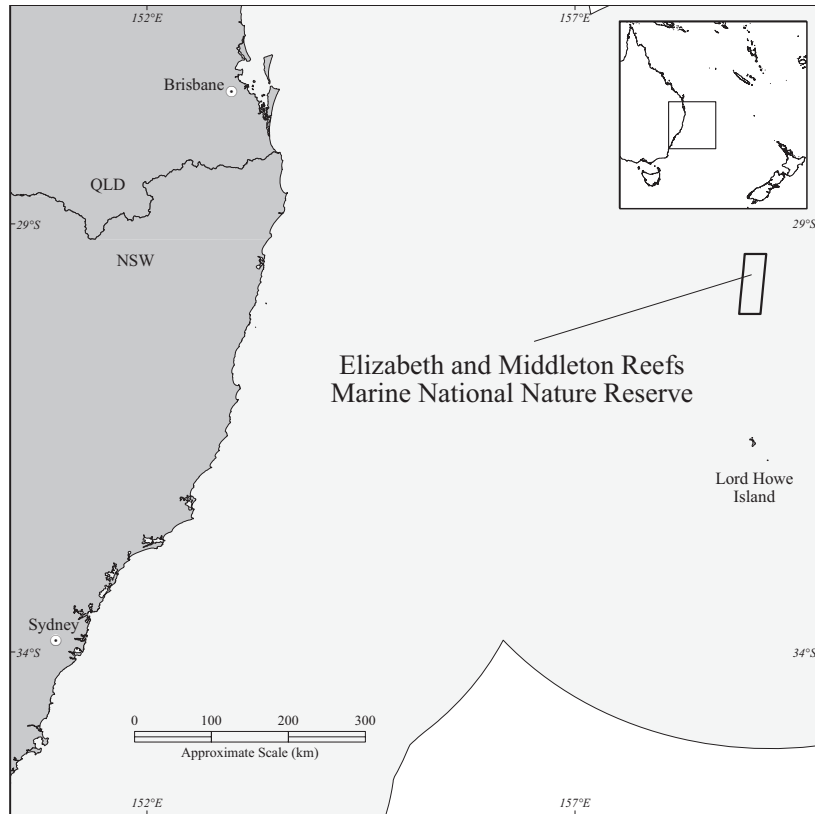
Elizabeth and Middleton Reefs Marine National Nature Reserve (the Reserve) was declared on 23 December 1987 by Proclamation under the *National Parks and Wildlife Conservation Act 1975* which was replaced on 16 July 2000 by the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Reserve continues in existence as a Commonwealth reserve under the EPBC Act pursuant to the *Environmental Reform (Consequential Provisions) Act 1999*, which deems the Reserve to have been declared for the following purposes:

- The preservation of the area in its natural condition; and
- The encouragement and regulation of the appropriate use, appreciation and enjoyment of the area by the public.

Appendix 2 of this Plan reproduces the proclamation which includes a schedule that describes the boundaries of the Reserve.



1.2 Conservation Significance of the Reserve

Rising from volcanic seamounts in the northern Tasman Sea, the Elizabeth and Middleton Reefs are the southernmost open ocean platform reefs in the world. A combination of isolation, and exposure to convergent tropical and temperate ocean currents and climates has given rise to a distinct and diverse assemblage of marine species including a number of endemic species. Many species are at either the northern or southern limit of their distribution.



Map 1: Location of Elizabeth and Middleton Reefs Marine National Nature Reserve

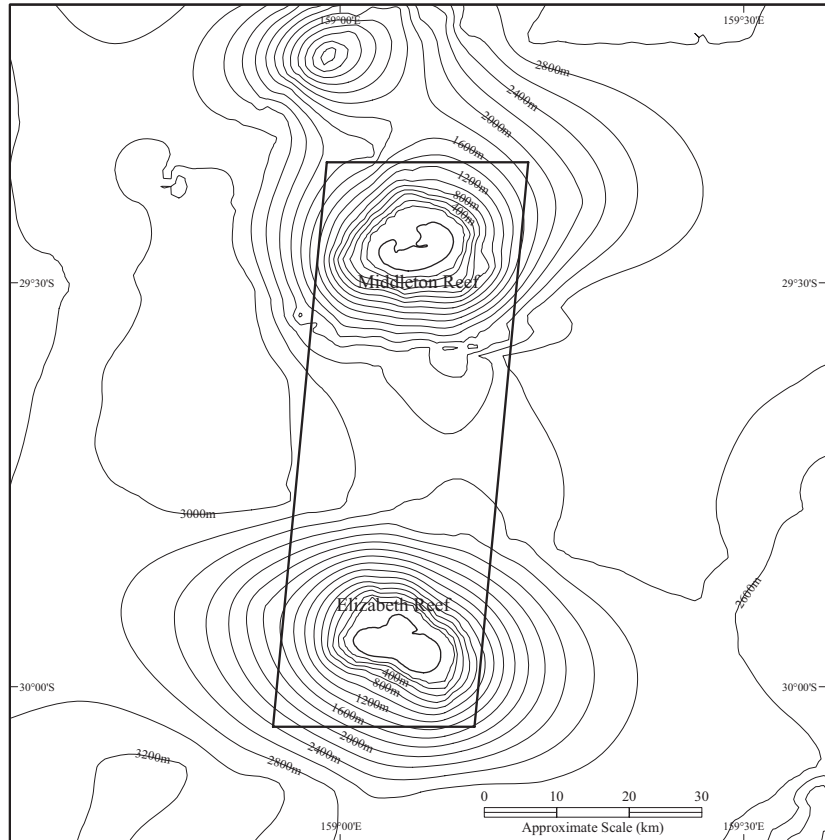
Legend

-  Australian Exclusive Economic Zone (EEZ) and Territorial Sea
-  Elizabeth and Middleton Reefs Marine National Nature Reserve

Caveat: Data is assumed to be correct as received from the data suppliers




Australian Government Data Sources:
 Geoscience Australia (2001): Australian Maritime Boundary Information System (AMBIS) v1.1.
 Department of the Environment and Heritage (2004): Marine Protected Areas Managed by DEH.
 ABS (1991): Populated Places (1991) Australia.
 Geoscience Australia (1998): TOPO-2.5M Topographic Data.

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**Map 2: Bathymetry of Elizabeth and Middleton Reefs
Marine National Nature Reserve**

Legend:

-  Reserve Boundary
-  Lowest Astronomical Tide (LAT)
-  Bathymetric contours

Caveat: Data are assumed to be correct as received from the data suppliers

Projection: Geographics
Datum: WGS84

Australian Government Data Sources:
Geoscience Australia (2001): Australian Maritime Boundary Information System (AMBIS) v1.1.
Geoscience Australia (2002): Bathymetry Grid and Contours for the Australian Region - 36 second.
Department of the Environment and Heritage (2004): Commonwealth Marine Protected Areas Managed by DEH.

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The isolation of the Reefs has also made them a refuge for the black cod, *Epinephelus daemeli*, which was once common along the New South Wales coast, but which is now very uncommon and listed as vulnerable under the New South Wales *Fisheries Management Act 1994*, the Commonwealth *Fisheries Management Act 1991* and has been nominated for listing under the EPBC Act. In addition to the diverse assemblage of corals and fish, the islands and their surrounding waters are used as feeding grounds by a number of species of migratory seabirds and by green turtles, *Chelonia midas*, which are listed under the EPBC Act, and as breeding grounds for the common noddy, *Anous stolidus*.

A total of 111 species of coral were identified during a 2003 marine survey compared with 122 identified by Veron and Done during a 1979 survey. The structure of the coral community at Elizabeth and Middleton Reefs was similar to that observed during previous surveys: the cover of hard coral was at a moderate level and consistent with a reef recovering from disturbance. No bleaching and very little crown-of-thorns starfish (COTS) activity was observed. The percent cover of Acropora coral seen during this survey was lower than seen by Veron and Done, however the high disturbance regime, in combination with the distance from other reef systems, and the historic presence of COTS, suggests that a high abundance of Acropora is likely to be a rare event.

A total of 181 fish species were recorded during the most recent survey: 61 of these species are new records for the Reefs, raising the number of species recorded on the reef to 311. Forty-five of these species represent new records for the Reserve. Comparisons between the most species rich fish genera at Elizabeth Reef in 1987 and 2003 showed that the species richness and species complement of dominant genera differed little after a 16-year gap in surveys. Black cod abundance was estimated at 4 cod/hectare during both the surveys with no evidence that cod numbers had either increased or decreased since last surveyed in 1987, although direct abundance comparisons were not possible. The maximum black cod length recorded at Elizabeth Reef during 2003 surveys was 1.5m, around the maximum length recorded in Australian waters.

High numbers of Galapagos sharks (*Carcharhinus galapagensis*) were observed at the Reefs. Their size suggests the Reefs are an important nursery area for Galapagos sharks. The presence of these sharks in the Reserve is very significant as this species is unlikely to be present at other Australian reef systems (excluding Lord Howe Island).

Holothurians (sea cucumbers) are found at high densities at the Reefs. *Holothuria whitmaei (nobilis)* (black teatfish) has been observed at densities higher than previously reported in other areas in Australia. *Holothuria atra* (lollyfish or black sea cucumber) are also found in high densities, as in many other areas in the Indo Pacific.

Natural heritage values

The outstanding conservation values of the Reserve include:

- the variety of ecosystems not represented in other marine protected areas;
- the isolated oceanic environment with associated faunal assemblages considered unique within Australian waters (Australian Museum, 1992);
- distance from the tropics makes the open-ocean platform reefs the most southerly in the world;
- being one of the last remaining sites in Australian waters which remains a major population centre for the black cod which is protected under the *Fisheries Management Act 1991*; the *New South Wales Fisheries Management Act 1994*, and nominated for listing under the EPBC Act;
- the occurrence of feeding and roosting areas for migratory marine species, including several seabirds listed under the Bonn Convention and the Japan-Australia and China-Australia Migratory Birds Agreements (JAMBA and CAMBA);
- importance as a foraging area for marine turtles;
- inclusion on the List of Wetlands of International Importance under the Ramsar Convention;

- the wilderness values of a remote, relatively undisturbed area;
- the presence of endemic species of corals, molluscs and fish; and
- the presence, and often abundance, of a number of marine species with a restricted south-west Pacific distribution.

Contribution to regional and national conservation

The Reserve contributes to the National Representative System of Marine Protected Areas (NRSMPA), which aims to protect representative samples of all Australia's marine environments in all Australian jurisdictions. In doing so it helps to meet community expectations that Australia's marine environment will be conserved.

The nearest Commonwealth marine protected area, Lord Howe Island Marine Park (Commonwealth waters), is established around Lord Howe Island and Balls Pyramid about 150 kilometres to the south. This Park adjoins a New South Wales park established in the coastal waters of NSW and extends from the limit of coastal waters (3 nautical miles) to the territorial sea limit (12 nautical miles). Lord Howe Island and Elizabeth and Middleton Reefs are connected in terms of ocean dynamics and shared species and ecological characteristics. For this reason the Reserve further protects the values of World Heritage listed Lord Howe Island and surrounding waters.

Cultural heritage values

The Reserve contributes to the conservation of Australian maritime heritage. Elizabeth and Middleton Reefs are located near a number of historical shipping routes to and from Sydney, Newcastle and Brisbane. Shipwrecks occurred on the reef throughout the history of European settlement of Australia. At least 30 ships are thought to have been wrecked on Elizabeth and Middleton Reefs. Whilst some of the more recent wrecks are visible, and indeed prominent features of the landscape, the majority have not been accurately located. Appendix 6 lists ships and other vessels known to have been wrecked on Elizabeth and Middleton Reefs.

This Management Plan provides for the continuing protection, appreciation and enjoyment of a remote area, its natural species and its shipwrecks.

Elizabeth and Middleton Reefs have long been regarded by Lord Howe Islanders as important to island culture. This link has resulted in a degree of stewardship over the reefs as well as generating anecdotal information about their marine life that has and will continue to augment scientific research.

1.3 Previous Management Plans

This is the second Management Plan for the Reserve. The first Plan came into operation on 24 March 1994 and ceased to have effect on 23 March 2004.

1.4 Structure of this Management Plan

This management plan has been structured within Parks Australia's *Strategic Planning and Performance Assessment Framework*. The Framework sets down, within the broader context of the Department of the Environment and Heritage's Corporate Plan, a set of outcomes based on government policy, legislative requirements and the management requirements of the protected area estate that is the responsibility of the Director of National Parks. The outcomes are developed against the following seven Key Result Areas (KRA):

- 1: Natural Heritage Management
- 2: Cultural Heritage Management
- 3: Joint Management
- 4: Visitor Management and Reserve Use
- 5: Stakeholders and Partnerships
- 6: Business Management
- 7: Biodiversity Knowledge Management

Note that not all Key Result Areas are applicable to all reserves. Key Result Areas 3 and 7 are not relevant to Elizabeth and Middleton Reefs Marine National Nature Reserve and are not addressed in this Plan.

Each section of this plan contains an 'Aim', one or more 'Performance Indicators' and a series of 'Prescriptions'. The 'Prescriptions' set out controls on activities in the Reserve and strategies for managing the Reserve.

In addition to annual reporting on implementation of the prescriptions contained in this Plan (see Part 2), it is proposed that progress against identified aims also be measured periodically.

Progress toward achieving each aim will be assessed using appropriate performance indicators which are included in each section of the Plan. During the life of the Plan, and in accordance with an adaptive management approach, indicators may be varied to ensure that they are the most appropriate or efficient ones to use.

2.0 Legal Context

2.1 Director of National Parks

Administration, management and control of Commonwealth reserves are the function of the Director of National Parks (the Director), a corporation under the EPBC Act (s.514B). The Director has delegated his powers and functions under the EPBC Act (s.515) to the Assistant Secretary, Marine Conservation Branch, Department of the Environment and Heritage.

2.2 Requirement to prepare and comply with a management plan

The EPBC Act requires the Director to prepare a management plan for the Reserve. When prepared, a plan is given to the Minister for the Environment and Heritage (the Minister) for approval. A management plan is a ‘legislative instrument’ for the purposes of the *Legislative Instruments Act 2003*, and, when approved, must be registered under that Act and tabled in each House of the Commonwealth Parliament. Either House of the Parliament may disallow a plan. A management plan for a Commonwealth reserve has effect for seven years, unless it is revoked and replaced by a new management plan.

The Director must exercise the Director’s powers and perform the Director’s functions to give effect to a management plan in operation for a Commonwealth reserve; and the Commonwealth and Commonwealth agencies must not perform functions or exercise powers in relation to the reserve inconsistently with the Plan (s.362).

2.3 Activities prohibited unless allowed by a management plan or permit

The EPBC Act (s.354) prohibits certain actions being taken in a Commonwealth reserve except in accordance with a management plan. These actions are:

- kill, injure, take, trade, keep or move a member of a native species; or
- damage heritage; or
- carry on an excavation; or

- erect a building or other structure; or
- carry out works; or
- take an action for commercial purposes.

The EPBC Act (s.355) also prohibits mining operations in a Commonwealth reserve unless the Governor-General has approved them and they are carried out in accordance with a management plan.

Civil and criminal penalties may be imposed for breaches of the EPBC Act.

Division 12.2 of the EPBC Regulations controls, or allows the Director to control, a range of activities in Commonwealth reserves including the use of vehicles and vessels, littering, commercial activities, commercial fishing, recreational fishing and research. Many of these activities are prohibited unless certain exemptions apply under r.12.06, for example where the Director has issued a permit that authorises the activity, or where a management plan in force for the Commonwealth reserve allows the activity. A management plan can provide that the activity be undertaken in accordance with a permit issued by the Director.

Criminal penalties may be imposed for breaches of the EPBC Regulations.

Hence, a management plan is an essential part of the effective regulation of the Reserve. It is the only way to allow certain uses of the Reserve that would otherwise be prohibited by the EPBC Act and Regulations.

2.4 Activities that may require additional environmental approval

Other parts of the EPBC Act may also be relevant to the management of the Reserve and the taking of actions in, and in relation to, the Reserve.

Firstly, actions that will, or are likely to, have a significant impact on matters of ‘national environmental significance’ will be subject to the assessment and approval provisions of Part 9 of the EPBC Act (irrespective of where the action is taken). Matters of national environmental significance are identified in Part 3 of the Act. They include the environment in a Commonwealth marine area and threatened and migratory species listed under the Act.

Responsibility for compliance with the assessment and approvals provisions of the EPBC Act lies with persons taking relevant actions. A person proposing to take an action that the person thinks may be, or is, a controlled action, should refer the proposal to the Minister for the Minister's decision whether or not the action is a controlled action. The Director may also refer proposed actions to the Minister.

Secondly, the EPBC Act contains provisions (Part 13) that prohibit and regulate actions in relation to listed threatened species and ecological communities, listed migratory species, and listed marine species in Commonwealth areas. Appendix 1 to this Management Plan sets out the species listed under the EPBC Act known or likely to occur in the Reserve, based on information available at the time this Management Plan was prepared. It should be noted that, over time, other species or communities found in the Reserve may be added to those already listed under the EPBC Act.

In summary, a person intending to take an action in the Reserve may require up to three independent types of approval under the EPBC Act:

- (i) Approval by the Minister under Part 9 for controlled actions, which are actions that are likely to have a significant impact on matters of national environmental significance;
- (ii) A permit from the Minister under Part 13 for activities that affect members of species protected by Part 13. Approval under Part 9 removes most requirements for a permit under Part 13 but not in relation to whales or other cetaceans; and/or
- (iii) A permit from the Director for activities covered by section 354(1) of the EPBC Act or EPBC Regulations; or, if the action is a mining operation conducted in accordance with the Management Plan, approval by the Governor-General.

2.5 Purpose and content of a Management Plan

Under the EPBC Act (s.367) a management plan for a Commonwealth reserve must provide for the protection and conservation of the reserve. In particular, the plan must (so far as relevant to the Reserve):

- assign the reserve to an IUCN category (whether or not a proclamation has assigned the reserve or a zone of the reserve to that IUCN category);
- state how the reserve, or each zone of the reserve, is to be managed;
- state how the natural features of the reserve, or of each zone of the reserve, are to be protected and conserved;
- specify any limitation or prohibition on the exercise of a power, or performance of a function, under an Act in or in relation to the reserve;
- specify any mining operation, major excavation or other works that may be carried on in the reserve, and the conditions under which it may be carried on;
- specify an operation or activity that may be carried on in the reserve;
- indicate generally the activities that are to be prohibited or regulated in the reserve, and the means of prohibiting or regulating them; and
- indicate how the plan takes account of Australia's obligations under each agreement with one or more other countries that is relevant to the reserve (including the World Heritage Convention and the Ramsar Convention, if appropriate).

A management plan may divide a Commonwealth reserve into zones and assign each zone to an IUCN category. The category to which a zone is assigned may differ from the category to which the reserve is assigned (s.367(2)).

A management plan must not make any provisions that are inconsistent with the management principles for the IUCN category to which the reserve or a zone of the reserve is assigned (s.367(3)).

2.6 International agreements

This Management Plan must take account of Australia's obligations under relevant international agreements. The following agreements are relevant to the Reserve:

Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention).

The Ramsar Convention is an international treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The Reserve is included in the List of Wetlands of International Importance under the Ramsar Convention. A copy of the Reserve Ramsar information sheet is at Appendix 4. Australian Ramsar management principles are prescribed by the EPBC Regulations (Schedule 6). An extract from the principles is at Appendix 3. This Management Plan is consistent with these Ramsar management principles.

Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention or CMS).

The Bonn Convention aims to conserve terrestrial, marine and avian migratory species throughout their range. Parties to this convention work together to conserve migratory species and their habitats.

Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment (CAMBA).

CAMBA provides for China and Australia to co-operate in the protection of migratory birds listed in the Annex to the Agreement, and their environment, and requires each country to take appropriate measures to preserve and enhance the environment of migratory birds.

Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA)

JAMBA provides for Japan and Australia to co-operate in taking measures for the management and protection of migratory birds, birds in danger of extinction, and the management and protection of their environments, and requires each country to take appropriate measures to preserve and enhance the environment of birds protected under the provisions of the agreement.

Species listed under the CMS, CAMBA and JAMBA are listed migratory species under the EPBC Act (Appendix 1).

Convention on Biological Diversity (CBD)

The Reserve assists Australia in meeting its obligations under the CBD, which requires countries to develop and implement strategies for sustainable use and protection of biodiversity, including establishing protected areas. An international programme of work to protect marine and coastal biological diversity was agreed in February 2004 under the auspices of the CBD. It establishes an international agenda for protecting marine biodiversity, including establishing networks of marine and coastal protected areas.

International Convention for the Prevention of Pollution from Ships (MARPOL 73/78 Convention)

The MARPOL 73/78 Convention deals with the discharge of operational ship-sourced pollutants. It is the basis for Australian and State Government regulation of pollution from all ships, including fishing vessels, in Australian waters. The International Maritime Organization (IMO), a specialised agency of the UN, administers this Convention and related conventions. Provisions for the protection of this Reserve are consistent with Australia's international obligations.

The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, London 1972 (the London Convention 1972) and 1996 Protocol

Australia is a signatory to the London Convention 1972, the objective of which is to control all sources of marine pollution and prevent pollution through the regulation of waste dumping into the sea. In Australia the deliberate loading, dumping and incineration of waste at sea is regulated by the *Environment Protection (Sea Dumping) Act 1981*.

United Nations Convention on the Law of the Sea (UNCLOS)

UNCLOS was agreed in 1982 and came into force for Australia in 1994. It provides a framework to regulate many aspects of uses of the sea and conservation of the marine environment. UNCLOS includes the right of innocent passage of foreign ships through the territorial sea, and the freedom of navigation through the Exclusive Economic Zone (EEZ).

The right of innocent passage allows foreign ships to pass through the territorial sea, without entering internal waters or calling at a roadstead or port facility outside internal waters, or proceeding to or from internal waters or a call at such roadstead or port facility. Passage must be continuous and expeditious, but includes stopping and anchoring in the course of ordinary navigation, or if it is necessary by *force majeure* or distress or to assist persons, ships or aircraft in danger or distress. Certain activities are specified as not being innocent passage including launching, landing or taking on board aircraft; wilful and serious pollution contrary to UNCLOS; fishing; research or survey activities; other activities not having a direct bearing on passage.

UNCLOS requires that foreign ships enjoying the right of innocent passage through the territorial sea must comply with laws relating to certain matters, including conservation of the living resources of the sea; prevention of infringement of the fisheries laws; preservation of the environment and the prevention, reduction and control of pollution of the environment; and marine scientific research and hydrographical surveys.

Within the EEZ foreign ships have rights closely associated with their rights on the high seas, including the freedom of navigation. Ships enjoying the freedom of navigation must comply with laws relating to certain matters, including marine scientific research, and protection and preservation of the marine environment.

2.7 Other relevant legislation

Other legislation relevant to uses of the Reserve are referred to in Sections 6 and 7 of this Management Plan.

3.0 Interpretation

3.1 Short title

This Management Plan may be cited as the Elizabeth and Middleton Reefs Marine National Nature Reserve Management Plan 2006-2013.

3.2 Commencement and termination

This Management Plan will come into operation following approval by the Minister under section 370 of the EPBC Act, on the date it is registered under the *Legislative Instruments Act 2003*, and will cease to have effect seven years after commencement, unless sooner revoked and replaced by a new Management Plan.

3.3 Interpretation (including Acronyms)

In this Management Plan:

ADF means the Australian Defence Force.

Australian IUCN reserve management principles have the meaning given by s.348(1) of the EPBC Act.

Bonn Convention means the Convention on the Conservation of Migratory Species of Wild Animals.

CBD means the Convention on Biological Diversity.

CAMBA means the Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment.

Commonwealth marine area has the meaning given by s.24 of the EPBC Act.

Commonwealth reserve means a reserve declared under Division 4 of Part 15 of the EPBC Act.

Department means the government agency responsible for administering the EPBC Act being, at the time of preparation of this Plan, the Australian Government Department of the Environment and Heritage.

Director means the Director of National Parks as described in section 514A of the EPBC Act.

EPBC Act means the *Environment Protection and Biodiversity Conservation Act 1999*, including Regulations under the Act, and includes reference to any Act amending, repealing or replacing the EPBC Act.

EPBC Regulations means the *Environment Protection and Biodiversity Conservation Regulations 2000* and includes reference to any Regulations amending, repealing or replacing the EPBC Regulations.

Innocent Passage: Ships of all States, whether coastal or land-locked, enjoy the right of innocent passage through the territorial sea. Limitations to innocent passage are that a vessel cannot do anything that is prejudicial to the peace, good order or security of the coastal state. Activities such as fishing, research, pollution or other activity not having a direct bearing on passage, are not innocent passage.

IUCN means the World Conservation Union.

IUCN category has the meaning given by s.346(1) of the EPBC Act.

JAMBA means the Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment.

KRA means Key Result Area, which is explained in Section 1.4 of this Management Plan.

MARPOL 73/78 Convention means the International Convention for the Prevention of Pollution from Ships 1973, as modified by the Protocol of 1978.

Mining operations has the meaning given by s.355 of the EPBC Act. The term covers a broad range of activities, including exploration for 'minerals', also defined by s.355.

Minister means the Minister responsible for administering the EPBC Act being, at the time of preparation of this Plan, the Minister for the Environment and Heritage.

Parks Australia means that part of the Department that assists the Director in performing the Director's functions under the EPBC Act.

Ramsar Convention means the Convention on Wetlands of International Importance especially as Waterfowl Habitat.

Ramsar Wetland means a wetland inscribed on the List of Wetlands of International Importance under the Ramsar Convention.

RAN means the Royal Australian Navy.

Territorial sea is where all the laws of the coastal state (Australia) extend beyond its land territory to that area of water extending up to 12 nautical miles as measured from the baselines determined in accordance with UNCLOS.

UNCLOS means the United Nations Convention on the Law of the Sea.

Part 2: How the Reserve will be managed

4.0 Zoning and IUCN categories

Background

Under the EPBC Act (s.367) a management plan for a Commonwealth reserve can divide the reserve into zones and must assign the reserve, and any zones, to one of the IUCN categories listed in the Act (s.347). The EPBC Regulations prescribe Australian IUCN management principles for each IUCN category. The management principles relevant to the Reserve are set out in Appendix 3.

The Reserve is divided by this Plan into two zones. A northern 'Sanctuary Zone' around and to the south of Middleton Reef to be managed as a 'strict nature reserve' for research and monitoring as well as appropriate passive use by the public. This zoning corresponds to the international IUCN category Ia. The southern 'Habitat Protection Zone' is around Elizabeth Reef, to be managed as a 'National Park' for research and monitoring, as well as appropriate use by the public, including recreational fishing under permit (refer to Map 3). This zoning corresponds to the international IUCN category II.

Prescriptions




- 4.1 The Reserve is assigned to the category - 'strict nature reserve' which corresponds to the international IUCN category Ia.
- 4.2 The Reserve is divided into a Sanctuary Zone, being the area of the Reserve north of the parallel of latitude 29 degrees 53 minutes south, and a Habitat Protection Zone being the area of the Reserve south of that parallel of latitude (see Map 3).
- 4.3 The Habitat Protection Zone is assigned to the category - 'National Park', which corresponds to the international IUCN category II.
- 4.4 The Sanctuary Zone is assigned to the category - 'strict nature reserve', which corresponds to the international IUCN category Ia.

Map 3: Elizabeth and Middleton Reefs Marine National Nature Reserve

158° 59' E
29° 21' S

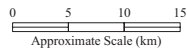
159° 14' E
29° 21' S

Legend:

-  Sanctuary Zone
no fishing, access allowed
-  Habitat Protection Zone
all access and fishing by permit only
-  Lowest Astronomical Tide (LAT)

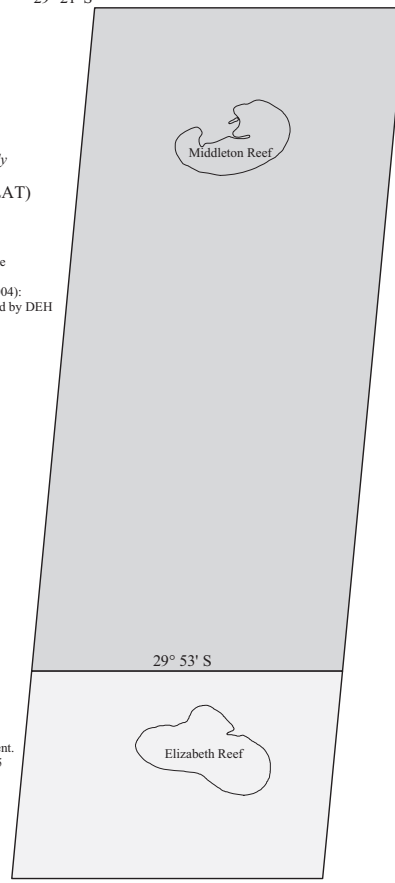
Australian Government Data Sources:
Geoscience Australia (2001): Australian Maritime
Boundary Information System (AMBIS) v1.1
Department of the Environment and Heritage (2004):
Commonwealth Marine Protected Areas Managed by DEH

Caveat: Data are assumed to be correct
as received from the data suppliers



Projection: Geographics
Datum: WGS84

Produced by: ERIN, Department of the
Environment and Heritage, Australian Government.
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158° 55' E
30° 03' S

159° 10' E
30° 03' S

5.0 Natural Heritage Management (KRA 1)

Aim: To protect and conserve physical habitat in its natural condition, and to conserve populations of all native species, particularly commercially valuable species vulnerable to population decline such as beche-de-mer and black cod.

Performance indicators

- Live coral cover
- Anchoring damage
- Abundance and population characteristics of beche-de-mer, black cod and reef fish.

Background

The Reserve contains a distinct and diverse assemblage of marine species including a number of endemic species. Many species are at either the northern or southern limit of their distribution.

The isolation of the Reserve has also made them a refuge for the black cod *Epinephelus daemeli* which was once common in waters off the coast of New South Wales coast but which is now uncommon. At the time of preparing this Plan the species is listed under section 15 of the Commonwealth *Fisheries Management Act 1991*, which means taking it in fishing operations is illegal unless covered by a scientific permit. It is listed as a vulnerable species in NSW under the NSW *Fisheries Management Act 1994*.

A number of species that are protected under Part 13 of the EPBC Act (listed threatened, migratory and marine species, and cetaceans) occur in the Reserve. The Reserve is used for feeding by a number of species of migratory seabirds and green turtles (*Chelonia midas*), listed under the EPBC Act, and as breeding grounds for the common noddy (*Anous stolidus*). These species are listed in Appendix 1. Threatened species recovery plans, prepared under the EPBC Act, are in place for the great white shark and marine turtles.

This Section of the Management Plan provides a long-term strategy to monitor and improve the protection afforded to species of conservation significance, especially the black cod.

Section 7 of the Plan contains specific prescriptions relating to activities that can impact on habitat and thus on species in the Reserve.

Management of the Reserve aims to ensure that the physical habitat supporting the flora and fauna is protected from direct human impacts and invasive species. Natural events can and do have a significant impact on habitat. Where possible, these impacts will be monitored.

The extent of live coral cover can provide an indication of the overall condition of the Reserve. Substantial variations have been observed in the past. Continued monitoring should help determine the cause for the variation in coral cover. Available information points to a combination of cyclone/storm events, invasive species predation and/or coral bleaching as being the main factors.

Section 354(1) of the EPBC Act prohibits certain actions being taken in the Reserve, except in accordance with this Management Plan, including actions affecting members of native species, and carrying out works. This applies to the Director as well as to Reserve visitors and users.

Prescriptions

Note: Section 9.4 of this Management Plan requires the Director to regularly assess risks to the values of the Reserve.

- 5.1 The Director may take actions covered by s.354(1) of the EPBC Act to implement the prescriptions of this Management Plan, or when otherwise necessary, to:
- a. preserve or protect the Reserve; or
 - b. protect or conserve biodiversity or heritage in the Reserve; or
 - c. protect persons or property in the Reserve; or
 - d. manage the effects of actions taken by other persons in the Reserve in accordance with this Plan.

- 5.2 The Director will:
 - a. analyse Coastwatch data and other research to determine the level of anchoring activity and hence physical habitat damage;
 - b. measure indicators of physical habitat quality.
- 5.3 Subject to available resources the Director may record, collect and remove marine debris.
- 5.4 The Director will:
 - a. develop a data collection system to monitor recreational fishing catch, assess the effects of fishing and determine management effectiveness;
 - b. carry out or facilitate research into the black cod, bech-de-mer and other indicators of the status of flora and fauna;
 - c. take actions, or authorise actions to be taken, to implement relevant recovery plans for listed threatened species and threat abatement plans and wildlife conservation plans, under the Act, provided that the actions are not inconsistent with any other prescription in this Plan;
 - d. maintain effective liaison and working arrangements with Commonwealth authorities to ensure a continuous preparedness for responding to oil and chemical spills and shipwrecks;
 - e. seek inclusion of information about the Reserve on charts and other navigation information.

6.0 Cultural Resource Management (KRA 2)

Aim: To protect and maintain the historical and cultural significance of shipwrecks in the Reserve.

Performance Indicators

- Number of incidents involving direct human impacts on shipwrecks.
- Level of visitation to shipwreck areas.

Background

Middleton Reef was discovered on 20 July 1788 by Lieutenant John Shortland in the *Alexander*, as he sailed from the new settlement of Sydney to Batavia. Shortland named the reef in honour of Admiral Sir Charles Theodore Middleton.

The discovery of Elizabeth Reef is generally credited to the ships *Claudine* and *Marquis of Hastings* which recorded the existence of a reef to the south of Middleton Reef in 1820. However it is probable that the first European vessel to encounter the Elizabeth reef was the 301 ton whaler *Britannia* which was wrecked in the vicinity in 1806. Elizabeth reef was given its present name when the brig *Elizabeth* was wrecked there in 1831.

Elizabeth and Middleton Reefs are located near a number of historical shipping routes to and from Sydney, Newcastle and Brisbane. Shipwrecks on the reef platforms span most of the period of Australian history since European settlement. At least 30 ships are thought to have been wrecked on Elizabeth and Middleton Reefs. Whilst some of the more recent wrecks are visible, and indeed prominent features of the landscape, the large majority have not been accurately located. Appendix 6 lists ships and other vessels known to have been wrecked on Elizabeth and Middleton Reefs.

Under a declaration made under the *Historic Shipwrecks Act 1976*, all wrecks which are more than 75 years old are protected, together with their associated relics. The Minister for the Environment and Heritage can also make a declaration to protect any historically significant wrecks or articles and relics which are less than 75 years old.

The Act aims to ensure that historic shipwrecks are protected for their heritage values and maintained for recreational and educational purposes. It also seeks to control actions which may result in damage, interference, removal or destruction of an historic shipwreck or associated relic. Divers can use wreck sites for recreational purposes but relics must not be removed from the wreck site and the physical fabric of the wreck must not be disturbed, unless a permit has been obtained. The Act prohibits conduct that: destroys or causes damage to an historic shipwreck; causes interference with an historic shipwreck; causes the disposal of an historic shipwreck; or causes a historic shipwreck to be removed from Australia.

Prescriptions

- 6.1 Shipwreck condition and human impacts on shipwrecks will be monitored.

7.0 Visitor Management and Reserve Use (KRA 4)

Note: More than one of the Sections in this part of the Management Plan may apply to the actions of a person in the Reserve. For example, the general access provisions in this section will apply to a person carrying on recreational activities in accordance with Section 7.2

7.1 Entering and using the Reserve generally

Aim: Visitors to the Reserve enjoy satisfying experiences while the natural and cultural values of the reserve are maintained.

Performance indicators

- Number of reported breaches of Reserve management prescriptions;
- Number of ship-related pollution incidents detected and/or reported;
- Quantity and type of marine debris;
- Incidence of recreational visitation causing significant impacts on natural or cultural values.

Background

The Reserve is regularly visited by those on ocean yacht voyages, as well as by residents from nearby Lord Howe Island for recreational purposes. It is the aim of this Plan to allow appropriate recreational use of the Reserve by visitors in a way that ensures their continued enjoyment of the Reserve but which is also sensitive to the fragility of the area and maximises stewardship of the Reserve's values.

Given the remoteness and location of the Reserve, visitation has not been high and that is not likely to change in the near future. However, it is valuable as a shelter in bad weather and a stopover for yachts and Australian fishing vessel crews. Visitation brings a range of potential impacts on habitat including anchor

damage, marine debris, exotic organisms, sewage and poisonous antifouling agents.

Known dangers inside the Reserve include the unstable shipwrecks, such as the *SS Runic*, and dangerous boating conditions inside the lagoons at both islands. It is not feasible, however, to install warning signs within the Reserve.

Many visitors to the Reserve seek shelter from rough weather. The shelter available is dependent on the vessel and the direction of the winds. The shallowness of the lagoons at both islands naturally limits access so most anchoring occurs within Middleton Reef where there is a semi protected anchorage. It is difficult to define a viable sheltered anchoring area that would limit the environmental impacts of anchoring (as in other Commonwealth reserves) due to highly variable wind direction.

As the level of visitation to the Reserve is low and is expected to remain so in the foreseeable future, the environmental impacts of anchoring are expected to be low also and the cumulative impact minimal.

Few ships transit within 20 kilometres of either Elizabeth or Middleton Reef, nevertheless, pollution from ships passing near the Reserve has the potential to adversely affect the Reserve's ecosystems. Pollution originating from commercial shipping including oil and oil products, other chemicals, garbage, marine debris and sewage, could cause significant damage to most marine life including birds, fish, and corals. Ballast water release is also one of the main vectors for the translocation of non-indigenous marine organisms around the world. The threat of 'introduced pests' is a significant risk to the integrity of the Reserve.

As noted in Section 2.3 of this Plan, s.354 of the EPBC Act prohibits certain actions being taken in a Commonwealth reserve except in accordance with a management plan, including actions affecting native species and actions for commercial purposes. Section 2.3 also outlines Division 12.2 of the EPBC Regulations, which controls, or allows the Director to control, a range of activities in Commonwealth reserves. These Regulations include provisions that prohibit or regulate visitor and recreational activities in the Reserve. Of particular relevance to access to and general use of the Reserve is regulation 12.23, which gives the Director power to prohibit or restrict entry to a Commonwealth

reserve, or part of a reserve. To give effect to the zoning and IUCN categorisation of the Reserve, this Plan provides for access to the Habitat Protection Zone to be prohibited without a permit.

The EPBC Regulations include other provisions that prohibit or regulate visitor and recreation activities in the Park, including:

- r.12.14 – discharging waste, refuse or any noxious, offensive or polluting substance; and
- r.12.15 – possession and use of firearms, spears and other devices for taking animals (including nets).

Regulation 12.56 authorises the Director to make various kinds of determinations controlling the use of vessels, including prohibiting use, or requiring use of designated anchorages and moorings.

Activities that are otherwise prohibited in the Reserve by the EPBC Regulations will be exempt if covered by an exception prescribed by r.12.06 (1). These exceptions include an activity that:

- is provided for by, and carried out in accordance with, a management plan in force for the reserve (12.06 1a); or
- is authorised by a permit in force under subregulation (2) (12.06 1c); or
- is carried out by a Commonwealth agency, or an agency of a State or of a self-governing Territory and is reasonably necessary for law enforcement (12.06 1i); or
- is reasonably necessary to deal with an emergency involving a serious threat to human life or property (12.06 1j); or
- occurs because of an unavoidable accident, other than an accident caused by negligent or reckless behaviour (12.06 1k).

Provisions of Part 13 of the EPBC Act prohibit actions affecting members of listed threatened migratory and marine species, and cetaceans in the Reserve (eg. causing death or injury, taking, keeping, moving) unless authorised by a permit issued by the Minister, or another exception in Part 13 applies. The Secretary of the Department must be notified of actions that are exempt, but not authorised by a permit, within seven days of the action.

Part 8 of the EPBC Regulations regulates the way aircraft, vessels and humans can operate in the proximity of cetaceans. Other Commonwealth laws also contribute to protecting the Reserve from the impacts of shipping and aviation.

The *Air Navigation Act 1920* implements the terms of the Chicago Convention and preserves the right of licensed international air services to fly across and land in Australian territory. Every aircraft in Australia must comply with the *Air Navigation (Aircraft Noise) Regulations*. Airservices Australia is responsible for ensuring compliance with aircraft noise regulations.

Various Commonwealth laws, particularly the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983*, implement the MARPOL 73/78 Convention and other international agreements relevant to 'protection of the sea' from the environmental impacts of shipping, including fishing vessels. These laws restrict the discharge of polluting substances, such as oily mixtures, sewage and plastics, from vessels into the sea. Under these laws the master of a vessel involved in a pollution incident must report the incident. The Australian Maritime Safety Authority (AMSA) is responsible for applying these laws in the Commonwealth waters in and around the Reserve.

The prescriptions below apply to entry and use of the Reserve generally. Sections 7.2 to 7.6 of this Management Plan prescribe how other uses such as recreational activities, research, and commercial activities can be carried on in the Reserve, including those that can only be undertaken with a permit issued by the Director.

Prescriptions

- 7.1.1 Entry without a permit to the Habitat Protection Zone will be prohibited by the issue of a notice of restriction by the Director under regulation 12.23 of the EPBC Regulations.

This prescription does not apply to vessels of the ADF when undertaking activities that do not contravene the EPBC Act or Regulations, such as vessel and aircraft transit, anchoring and surveillance. All ADF activities will be undertaken in accordance with the ADF Maritime Activities Environmental Management Plan, to ensure the values of the Reserve are conserved.

- 7.1.2 Notwithstanding the prohibition made under Section 7.1.1:
- a. Vessels may transit through the Habitat Protection Zone provided they remain at least 2 nautical miles from the edge of Elizabeth Reef.
- 7.1.3 The Director may issue permits in accordance with the EPBC Regulations authorising vessels (other than those to which Section 7.1.2 applies) to enter the Habitat Protection Zone.
- 7.1.4 Vessels without sewage holding tanks and which are less than 20 metres in length, may discharge sewage free of the chemical additives typically contained in portable chemical toilets within the Reserve, provided that it is not discharged within 1 nautical mile of reef edges.
- 7.1.5 Vessels fitted with sewage treatment facilities may discharge in the Reserve effluent treated to tertiary level.
- 7.1.6 Anchoring areas may be designated by determination under r.12.56 of the EPBC Regulations and/or moorings installed and mooring areas designated by determination under r.12.56 of the EPBC Regulations.
- 7.1.7 Information products that interpret Reserve values and management will be produced and distributed, and will include minimal impact practices for visitors and safety warnings about known risks in the Reserve.
- 7.1.8 In consultation with the commercial fishing industry and Lord Howe Island community, the Director will consider developing pre-arrival and post-departure reporting guidelines.

7.2 Fishing other than commercial fishing, taking of other native species

Aim: To maintain the Reserve's fish and invertebrates populations as well as other native species populations, in a natural condition while allowing for restricted forms of recreational fishing.

Performance Indicator

- Number of permits issued for recreational fishing.
- Incidents of illegal fishing.
- Total fish catch by species.

Background

The Reserve is often visited by residents from nearby Lord Howe Island for recreational fishing. The Reserve is also visited from time to time by people on yacht voyages. It is the aim of this Plan to allow basic recreational use of the Reserve by visitors, in a way that ensures their continued enjoyment of the Reserve, but which is also sensitive to the fragility of the area and maximises stewardship of the Reserve's values. Because the major recreational fishing is by Lord Howe Island residents or those from other NSW ports, it is intended that recreational fishing in the Habitat Protection Zone should be carried on in a way that is generally consistent with the laws applying to NSW as well as the Lord Howe Island Marine Park (Commonwealth Waters).

The Reserve has a relatively small reef area. The taking of significant numbers of fish and other marine organisms, particularly on a commercial scale, has the potential to adversely affect fish and invertebrate populations on the reefs. Regulation 12.35 of the EPBC Regulations (which operates subject to s.354 of the EPBC Act and this Management Plan) provides for recreational fishing subject to any restrictions and determinations made by the Director.

Australian commercial fishing vessels regularly visit the Reserve seeking protected anchorage. Under the first management plan for the Reserve, all commercial fishing was prohibited and it continues to be prohibited under this Plan (see Section 7.3), including prohibition on the use of recreational fishing gear from all Commonwealth commercial fishing vessels (AFV's).

The first management plan provided for restricted recreational fishing consistent with the protection of the black cod from accidental capture. This Plan introduces new restrictions that include a prohibition on all fishing in the Sanctuary Zone and a prohibition on all visitation to the Habitat Protection Zone without a permit (see Section 7.1). Visitation and recreational fishing in the Habitat Protection Zone will be through permit only, with strict fish possession and gear limits applying.

Prescriptions

7.2.1 Except as provided in Section 7.2.2 native species must not be taken in the Reserve.

Note: This does not affect actions by the Director under Section 5, or authorised research and monitoring under Section 7.6.

7.2.2 Vertebrate species of fish (excluding black cod and other protected species) may be taken for non-commercial purposes in the Habitat Protection Zone only in accordance with a permit issued by the Director under the EPBC Regulations and subject to any determinations made by the Director under regulation 12.35 of the Regulations.

7.2.3 Recreational fishing permits will not be issued to authorise fishing from commercial fishing vessels.

7.2.4 Permits will be issued subject to conditions, including:

- a. fishing must be carried on in a manner that is consistent with the laws of NSW (NSW Fisheries Management Regulations 1995) which are also applicable to the Lord Howe Island Marine Park (Commonwealth Waters). This includes all allowable harvestable species, gear, size and bag limit restrictions;
- b. total bag limit of a maximum of 10 fish per person, regardless of species and regardless of whether the NSW bag limits allows more than 10 fish per person;
- c. a boat limit of a maximum of 30 fish regardless of species and regardless of how many people are on board;

Note: The Director may revoke or introduce additional requirements for existing permit holders if at any time, the values of the Reserve are considered to be threatened by permitted activities.

- d. 24 hours prior notice must be provided to the Director or his representative on Lord Howe Island, advising of an intended fishing trip to the Reserve and the intended length of the trip;
- e. fish must not be filleted in the Reserve, except for the purpose of immediate consumption;
- f. a report must be submitted to the Director or his representative on Lord Howe Island, within 10 days of completing a fishing trip, reporting on:
 - the number and species of fish caught in the Reserve;
 - the number and species of fish caught and released;
 - any other vessels seen in the area, their observed activities and the vessel particulars if possible;
 - environmental observations such as unusual numbers of marine mammals, coral bleaching, crown of thorns starfish, marine debris, oil pollution etc.

7.3 Commercial use of the Reserve

Aim: Commercial activities are undertaken in a way that does not diminish the experience of other visitors while the natural and cultural values of the reserve are maintained.

Performance Indicators

- Number of permits issued authorising actions for commercial purposes.
- Incidence of commercial activities causing significant impacts on natural or cultural values or negative experiences for other visitors.

Background

Commercial activities within the Habitat Protection Zone of the Reserve at a level that maintains the zone in its natural or near natural state are consistent with 'national park' zoning principles. Commercial activities within the Sanctuary Zone will be considered on a case by case basis.

The Director will not take action against the skipper of a vessel (including an AFV) that enters the Habitat Protection Zone of the Reserve, provided they can demonstrate a genuine case of concern for safety at sea (see 7.3.4). Access to the Sanctuary Zone without a permit is allowed subject to 7.3.3 below.

As noted in Section 2.3 of this Plan, s.354(1) of the EPBC Act prohibits actions for commercial purposes in the Reserve, except in accordance with this Plan. This includes commercial fishing, commercial tours, and commercial filming and photography. Regulation 12.36 of the EPBC Regulations deems commercial activities carried out in the airspace above the Reserve up to 3,000 metres above sea level to be carried out in the Reserve, therefore requiring a permit or to be authorised by a management plan for the Reserve. Section 355 of the Act prohibits mining operations in the Reserve except with the approval of the Governor-General and carried out in accordance with this Management Plan. The definition of 'mining operations' in s.355 is broad. It covers all operations or activities connected with, or incidental to, the mining or recovery of minerals or the production of material from minerals, and includes exploration. 'Minerals' is also given a broad meaning by s.355, 'a naturally occurring substance or mixture of substances'.

Commercial tours are likely to bring the greatest concentrations of visitors to the Reserve. The numbers of visitors on large cruise ships may exceed the level the Reserve can sustain. At present, there are few visitors to the reserve and there are no commercial tour permits in operation. However, if there are indications that an increasing number of visitors are negatively impacting on the values of the reserve, the Director will introduce measures to manage and minimise these impacts. Commercial fishing, and commercial fishing charters, are considered inappropriate in the Reserve.

Prescriptions

- 7.3.1 All mining operations are prohibited in the Reserve.
- 7.3.2 Except as provided in 7.3.3 commercial fishing operations are prohibited in the Reserve.
- 7.3.3 Australian fishing vessels operating in the Australian Fishing Zone in accordance with fishing concessions granted under the Fisheries Management Act 1991 may enter the Sanctuary Zone in the course of fishing operations, provided that:
- a. no fish are taken in the Reserve;
 - b. fishing equipment, including firearms and nets, are not used or deployed and are kept stowed; and
 - c. relevant prescriptions in Section 7.1 are complied with.
- 7.3.4 Vessels may only enter the Habitat Protection Zone to seek shelter during times of distress (subject to Section 7.3.3)
- 7.3.5 Commercial charter fishing tours are prohibited in the Reserve.
- 7.3.6 Commercial tours (other than charter fishing tours) may be carried on in the Reserve, and in the airspace over the Reserve, in accordance with a permit issued by the Director under the EPBC Regulations. Permits may be issued where:
- the tour is to be conducted by a person with appropriate credentials and experience;
 - tour activities will not adversely affect the natural or cultural values of the Reserve;
 - tour activities will not detract from the remote area visitation experience of other visitors;
 - tour activities will not conflict or cause undesirable overlap with other activities in the Reserve;
 - tour activities do not include fish feeding or attracting sharks;

- the tour operator agrees to provide a brief report on tours conducted in/over the Reserve, in hard copy and/or by email, using a form to be provided by the Director;
- the total number of participants in a tour does not exceed 30, not including the skipper and crew; and
- aircraft do not operate at altitudes less than 500 feet above sea level.

7.3.7 Proposals to carry on other commercial activities in the Reserve such as filming and photography will be considered on a case by case basis, and may be carried on in the Reserve in accordance with a permit issued by the Director conforming to EPBC Regulations.

7.4 Facilities and installations

Aim: Developments do not have a negative impact on the natural or cultural values of the Reserve.

Performance Indicator

- Extent of negative impacts of facilities and installations on the natural and cultural values of the Reserve.

Background

As noted in Section 2.3 of this Plan, s.354(1) of the EPBC Act prohibits excavation, erection of a building or other structure, or carrying out of works in the Reserve except in accordance with this Plan. Regulation 12.11 of the EPBC Regulations, which operates subject to s.354(1) of the Act and this Plan, makes it an offence to carry on these activities in the Reserve.

There are no facilities or installations within the Reserve and no proposals for new facilities or installations are anticipated during the life of this Plan though it is *possible* a proposal could be received for the establishment of a facility like a navigational aid or a mooring in the Reserve. Actions proposed within the Reserve that are not controlled actions under Part 4 of the EPBC Act may still be subject to environmental assessment by the Director.

Prescriptions

- 7.4.1 A person may erect a building or structure in the Reserve, including carrying out an excavation or associated works, only in accordance with a permit issued by the Director where it is necessary for:
- a. maritime or visitor safety;
 - b. aiding navigation; and/or
 - c. maintaining the natural values of the Reserve, e.g. a mooring may prevent anchor damage to coral.

7.5 Research and Monitoring

Aim: To improve knowledge of the Reserve's natural and cultural heritage, as well as current uses and threats.

Performance indicators

- Number of research permits issued and refused.
- Number of scientific surveys and research programs.

Background

Research in the Reserve is prohibited by r.12.10 of the EPBC Regulations unless authorised by this Management Plan or a permit issued by the Director (or unless one of the other exceptions prescribed by r.12.06 of the EPBC Regulations applies). Research which involves taking, keeping, killing, injuring, trading, or moving, native species or is undertaken for commercial purposes is prohibited by s.354(1) of the EPBC Act except in accordance with this Plan. Research that affects listed threatened species or ecological communities, listed migratory species, cetaceans or listed marine species, is also regulated under Part 13 of the Act.

Section 301 of the EPBC Act authorises the EPBC Regulations to provide for the control of access to biological resources in Commonwealth areas, which include the Reserve. Regulations under the EPBC Act are now in place to control the taking of native species or any genetic resources, or biomolecules, for conservation, commercial application or industrial application.

The prescriptions below provide for a broad range of research activities to occur in the Reserve, including emerging activities that are not otherwise specified in this Management Plan.

Prescriptions

- 7.5.1 Scientific research activities (including activities that involve actions affecting members of native species) may be carried on in the Reserve in accordance with a permit issued by the Director under the EPBC Regulations.
- 7.5.2 The Director will issue a permit for the purposes of Section 7.5.1 only after assessing an application in accordance with Part 17 of the EPBC Regulations, and only if the proposed activity
- a. is consistent with the applicable Australian IUCN reserve management principles; and
 - b. is not likely to compromise the protection of biological diversity or the Reserve's conservation values, whether by itself or in combination with other natural or human influences and contributes to:
 - (i) understanding the marine environment and how human activities impact on it; and/or
 - (ii) effective management of the Reserve.
- 7.5.3 Actions affecting species protected under Part 13 of the Act may be carried on in the Park in accordance with a permit issued by the Minister.
- 7.5.4 A person may access biological resources in the Reserve in accordance with regulations made for the purposes of section 301 of the EPBC Act.

Note: The requirements of Sections 7.5.3 and 7.5.4 are in addition to Sections 7.5.1 and 7.5.2.

8.0 Stakeholders and Partnerships (KRA 5)

Aim: Stakeholders are satisfied with consultative and co-management processes.

Performance Indicators

- Feedback about consultative processes and Reserve management.
- The number of effective cooperative management initiatives, including research and compliance and enforcement initiatives.

Background

A broad range of stakeholders, including government and non-government organisations, have an interest in the management of this Reserve. It is vital that government and the local community work in partnership to ensure effective conservation outcomes.

Australian Government organisations, such as the Australian Defence Force (ADF) and the Australian Customs Service, are required to undertake a range of activities in the vicinity of Elizabeth and Middleton Reefs to support the conservation, protection and preservation of the marine environment. Operations may cover maritime surveillance and response; mapping; fisheries; emergency requirements including storm anchorage; and search and rescue.

Stakeholders are invited to participate in all stages of the development and implementation of this Management Plan. Potential benefits from a consultative and open approach include development of partnership arrangements that facilitate input, ownership and support from stakeholders. This will improve compliance with management policies and prescriptions, and enhance self-regulation of activities to protect the Reserve.

This Plan aims to facilitate a strong sense of resource stewardship and conservation among the regular visitors to the Reserve (mainly commercial fishers seeking sheltered anchorage, and visitors from Lord Howe Island). This is especially important given the remote location and the challenge of maintaining effective enforcement.

The development of a strong sense of stewardship through allowing continued access, including under permit (Section 7.1.3) will provide a mechanism to report activities occurring in the Reserve. Visitation, such as that undertaken by Lord Howe Island residents, will provide a stakeholder presence which may be utilised to assist in compliance and enforcement of the Management Plan's prescriptions. Anecdotal information collected by the Reserve's users may also be incorporated and cross referenced with scientific data collected in the Reserve.

Prescriptions

- 8.1 Timely and effective stakeholder participation will be sought throughout the implementation of this Plan.
- 8.2 The Director will work closely with regular visitors to the Reserve over the life of the Plan to improve the compliance and enforcement arrangements.
- 8.3 Cooperative management initiatives with agencies such as the Australian Customs Service, the Australian Fisheries Management Authority, the Department of Defence and the New South Wales Marine Parks Authority, will be developed and maintained.
- 8.4 Reporting mechanisms will be incorporated into the permits issued to stakeholders to visit the Habitat Protection Zone.

9.0 Business Management (KRA 6)

9.1 Implementation of this Management Plan

Aim: To ensure this Management Plan is implemented efficiently and effectively, and in accordance with relevant Australian Government policies.

Performance indicators

- Cost effectiveness of implementation of prescriptions in this Management Plan.

Background

It is the function of the Director under the EPBC Act (s.514B) to 'administer, manage and control' Commonwealth reserves. Personnel of the Department assist the Director in the performance of the Director's functions. The Director has delegated functions and powers under the EPBC Act and the EPBC Regulations to Departmental staff. Among other things, the Director requires that any risks to the values and effective management of a Commonwealth reserve be assessed regularly. Effective risk management may require adjustment to management priorities and the allocation of resources for management activities.

Prescriptions

- 9.1.1 The Director will regularly assess risks to the values and effective management of the Reserve.
- 9.1.2 The Director will regularly monitor the cost of implementing this Management Plan.

9.2 Communicating Reserve values

Aim: To enhance public and user awareness of the Reserve's values

Performance indicators

- Range, type and quantity of interpretive material made publicly available.

Prescriptions

- 9.2.1 The Director will update and disseminate interpretive material about the Reserve and its values.

9.3 Compliance and enforcement

Aim: To encourage users and visitors to comply with the EPBC Act, EPBC Regulations and this Management Plan

Performance indicators

- Trends in reports of non-compliance.

Background

The Director requires reserve management staff to assess and manage compliance risks with the aim of achieving compliance using education and an escalating range of enforcement sanctions, based on the Department's Compliance and Enforcement Policy and Strategy and the Parks Australia Compliance and Enforcement Manual.

Civil and criminal penalties apply to breaches of the EPBC Act and EPBC Regulations. Of particular relevance to the Reserve, civil penalties apply to contraventions of s.354 of the EPBC Act, including actions that contravene this Management Plan, and criminal penalties apply to contraventions of Part 12 of the EPBC Regulations and to contravening a permit condition.

Under the EPBC Regulations the Director can vary permit conditions. Where conditions are breached the Director may suspend or cancel a permit.

The Minister can appoint rangers, wardens and inspectors under the Act. People who can be appointed include staff of the Department, and officers or employees of other Commonwealth, State or Territory agencies. Inspectors and wardens have wide powers for enforcing the Act and Regulations relevant to managing the Reserve. All members of the Australian Federal Police are *ex officio* wardens.

The Department has agreements with the Coastwatch and the National Marine Unit of the Australian Customs Service for the provision of surveillance services in marine protected areas. The Department of Defence, through the RAN, may also carry out surveillance services in marine protected areas.

Prescriptions

- 9.3.1 The Director will regularly assess compliance risks.
- 9.3.2 The Director will provide Reserve users with information about the restrictions on activities in the Reserve, focussing on identified compliance risks.
- 9.3.3 The Director will plan and carry out surveillance of the Reserve focussing on identified risks, where possible in cooperation with other agencies.
- 9.3.4 The Department will organise training and appointment of wardens in adequate numbers to support compliance and enforcement activities.
- 9.3.5 The Director will regularly review the Reserve's compliance and enforcement arrangements.

9.4 Performance assessment

Aim: To monitor progress in implementing this Management Plan in a way that contributes to an assessment of the effectiveness of Reserve management

Performance Indicator

- An assessment of the effectiveness of this Management Plan to contribute to the development of the next Management Plan.

Background

A performance assessment framework to help identify clear outcomes for the agency and for individual parks and reserves has been developed. Performance reporting, including reporting on the implementation of this Management Plan, will use this framework.

Prescriptions

- 9.4.1 The Director will assess the effectiveness of implementation of this Management Plan in time to contribute to the development of the next Management Plan including an examination of the performance indicators identified in this Plan.

Part 3: Further reading and appendices

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Appendix 1: Listed species under the EPBC Act known or likely to occur in Elizabeth and Middleton Reefs Marine National Nature Reserve*

Latin Name	Common Name	EPBC Act Status	Other listings
Mammals			
Balaenoptera musculus	Blue Whale	Endangered Cetacean Listed migratory	Bonn Convention
Eubalaena australis	Southern Right Whale	Endangered Cetacean Listed migratory	Bonn Convention
Balaenoptera borealis	Sei Whale	Vulnerable Cetacean	
Balaenoptera physalus	Fin Whale	Vulnerable Cetacean	
Megaptera novaeangliae	Humpback Whale	Vulnerable Cetacean Listed migratory	Bonn Convention
Lagenorhynchus obscurus	Dusky Dolphin	Cetacean Listed migratory	Bonn Convention
Reptiles			
Chelonia mydas	Green Turtle	Vulnerable Listed marine Listed migratory	Bonn Convention
Dermochelys coriacea	Leathery Turtle, Leatherback Turtle, Luth	Vulnerable Listed marine Listed migratory	Bonn Convention
Birds			
Diomedea exulans	Wandering Albatross	Vulnerable Listed marine Listed migratory	Bonn Convention JAMBA
Diomedea antipodensis	Antipodean Albatross	Vulnerable Listed marine Listed migratory	Bonn Convention

Thalassarche impavida	Campbell Albatross	Vulnerable Listed marine Listed migratory	Bonn Convention
Diomedea gibsoni	Gibson's Albatross	Vulnerable Listed marine Listed migratory	Bonn Convention
Thalassarche cauta	Shy Albatross	Vulnerable Listed marine Listed migratory	Bonn Convention
Fregetta grallaria grallaria	White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian)	Vulnerable	
Pterodroma neglecta neglecta	Kermadec Petrel (western)	Vulnerable	
Anous stolidus	common noddy	Listed Marine	JAMBA CAMBA
Pterodroma macroptera	great-winged petrel	Listed Marine	
Pterodroma externa	white-necked petrel	Listed Marine	
Puffinus carneipes	fleshy-footed shearwater	Listed Marine Listed Migratory	JAMBA
Puffinus pacificus	wedge-tailed shearwater	Listed Marine Listed Migratory	JAMBA
Puffinus griseus	sooty shearwater	Listed Marine Listed Migratory	JAMBA CAMBA
Sula dactylatra	masked booby	Listed Marine Listed Migratory	JAMBA
Sterna bergii	sooty tern	Listed Marine	
Arenaria interpres	ruddy turnstone	Listed Marine Listed Migratory	JAMBA CAMBA Bonn Convention

Fish			
Carcharodon carcharias	Great White Shark	Vulnerable	
Other			
family Hydrophiidae	sea-snakes	Listed marine	
family Laticaudidae	sea-snakes	Listed marine	
family Cheloniidae	marine turtles	Listed marine	
family Syngnathidae	seahorses, seadragons and pipefish	Listed marine	

* Further species or ecological communities found in the Reserve may have been listed under the EPBC Act since this Management Plan was prepared.

Appendix 2: Proclamation of the Park

**The Arts, Sport, the Environment,
Tourism and Territories**

PROCLAMATION
Commonwealth of
Australia
N. M. STEPHEN
Governor-General

By His Excellency the
Governor-General of
the Commonwealth of
Australia
I, SIR NINIAN MARTIN STEPHEN, Governor-General
of the Commonwealth of Australia, acting with the advice
of the Federal Executive Council and after consideration
by the Federal Executive Council of a report by the Director
of National Parks and Wildlife in accordance with sub-
section 7 (11) of the *National Parks and Wildlife Conser-
vation Act 1975*, pursuant to subsection 7 (2) of that Act

1870 *Government departments*

and for the purposes of subsection 7 (3) and paragraphs
7 (4) (a) and 7 (6) (c) of that Act hereby:

- (a) declare the area specified in the Schedule to be a reserve;
- (b) assign the name 'Elizabeth and Middleton Reefs Marine National Nature Reserve' to that reserve;
- (c) specify the purposes for which the reserve is declared as conservation, protection of marine wildlife and habitats, scientific research and education; and
- (d) specify the depth of 1000 metres below the surface of any land within the area so declared to be a reserve as the depth to which the subsoil beneath that land shall be taken to be within that reserve; and
- (e) specify the depth of 1000 metres below the sea-bed beneath any sea within the area so declared to be a reserve as the depth to which the subsoil beneath that sea-bed shall be taken to be within that reserve.

SCHEDULE
Description of Area within Reserve

1. (1) All latitudes and longitudes referred to in clause 2 are latitudes and longitudes determined by reference to the World Geodetic System 1984.
- (2) Where, for the purposes of clause 2, it is necessary to determine the position on the surface of the Earth of a point, line or area by reference to the

Commonwealth of Australia Gazette
No. GN 34, 23 December 1987

World Geodetic System 1984, that position shall be determined by reference to a spheroid having its centre at the centre of the Earth and a major semi-axis of 6378137 metres and a flattening of 1/298.257223563.

2. The area specified is the area bounded by a line:

- (a) commencing at the point of Latitude 29°21' South, Longitude 158°59' East;
- (b) running thence east along the parallel of Latitude 29°21' South to its intersection by the meridian of Longitude 159°14' East;
- (c) thence south-westerly along the geodesic to the point of Latitude 30°03' South, Longitude 159°10' East;
- (d) thence west along the parallel of Latitude 30°03' South to its intersection by the meridian of Longitude 158°55' East; and
- (e) thence north-easterly along the geodesic to the point of commencement.

(L.S.) GIVEN under my Hand and the Great Seal of Australia on 11 December 1987.

By His Excellency's Command,
GRAHAM RICHARDSON
Minister of State for
the Environment and the Arts

GOD SAVE THE QUEEN!

Appendix 3: Australian IUCN reserve management principles (extract)

Environment Protection and Biodiversity Conservation Regulations 2000

Schedule 8 Australian IUCN reserve management principles (EPBC Regulation 10.04)

Part 1 General administrative principles

1 Community participation

Management arrangements should, to the extent practicable, provide for broad and meaningful participation by the community, public organisations and private interests in designing and carrying out the functions of the reserve or zone.

2 Effective and adaptive management

Management arrangements should be effective and appropriate to the biodiversity objectives and the socio-economic context of the reserve or zone. They should be adaptive in character to ensure a capacity to respond to uncertainty and change.

3 Precautionary principle

A lack of full scientific certainty should not be used as a reason for postponing measures to prevent degradation of the natural and cultural heritage of a reserve or zone where there is a threat of serious or irreversible damage.

4 Minimum impact

The integrity of a reserve or zone is best conserved by protecting it from disturbance and threatening processes. Potential adverse impacts on the natural, cultural and social environment and surrounding communities should be minimised as far as practicable.

5 Ecologically sustainable use

If resource use is consistent with the management principles that apply to a reserve or zone, it should (if it is carried out) be based on the principle (the principle of *ecologically sustainable use*) that:

- (a) natural resources should only be used within their capacity to sustain natural processes while maintaining the life-support systems of nature; and
- (b) the benefit of the use to the present generation should not diminish the potential of the reserve or zone to meet the needs and aspirations of future generations.

6 Transparency of decision-making

The framework and processes for decision-making for management of the reserve or zone should be transparent. The reasons for making decisions should be publicly available, except to the extent that information, including information that is culturally sensitive or commercial-in-confidence, needs to be treated as confidential.

7 Joint management

If the reserve or zone is wholly or partly owned, by Aboriginal people, continuing traditional use of the reserve or zone by resident indigenous people, including the protection and maintenance of cultural heritage, should be recognised.

Part 2 Principles for each IUCN category

1 Strict nature reserve

Note This category corresponds to the International Union for the Conservation of Nature (*IUCN*) protected area management category Ia.

- 1.1 The reserve or zone should be managed primarily for scientific research or environmental monitoring based on the following principles.

- 1.2 Habitats, ecosystems and native species should be preserved in as undisturbed a state as possible.
- 1.3 Genetic resources should be maintained in a dynamic and evolutionary state.
- 1.4 Established ecological processes should be maintained.
- 1.5 Structural landscape features or rock exposures should be safeguarded.
- 1.6 Examples of the natural environment should be secured for scientific studies, environmental monitoring and education, including baseline areas from which all avoidable access is excluded.
- 1.7 Disturbance should be minimised by careful planning and execution of research and other approved activities.
- 1.8 Public access should be limited to the extent it is consistent with these principles.

3 National park

Note This category corresponds to the international IUCN protected area management category II.

- 3.1 The reserve or zone should be protected and managed to preserve its natural condition according to the following principles.
- 3.2 Natural and scenic areas of national and international significance should be protected for spiritual, scientific, educational, recreational or tourist purposes.
- 3.3 Representative examples of physiographic regions, biotic communities, genetic resources, and native species should be perpetuated in as natural a state as possible to provide ecological stability and diversity.
- 3.4 Visitor use should be managed for inspirational, educational, cultural and recreational purposes at a level that will maintain the reserve or zone in a natural or near natural state.

- 3.5 Management should seek to ensure that exploitation or occupation inconsistent with these principles does not occur.
- 3.6 Respect should be maintained for the ecological, geomorphologic, sacred and aesthetic attributes for which the reserve or zone was assigned to this category.
- 3.7 The needs of indigenous people should be taken into account, including subsistence resource use, to the extent that they do not conflict with these principles.
- 3.8 The aspirations of traditional owners of land within the reserve or zone, their continuing land management practices, the protection and maintenance of cultural heritage and the benefit the traditional owners derive from enterprises, established in the reserve or zone, consistent with these principles should be recognised and taken into account.

Appendix 4: Information Sheet on Ramsar Wetlands - Elizabeth and Middleton Reefs Marine National Nature Reserve

Ramsar Site Number 60 - Elizabeth and Middleton Reefs Marine National Nature Reserve

1. Form compiled by:

Roger Jaensch, Warren Lee Long & Aaron Jenkins, Wetlands International - Oceania, GPO Box 787, Canberra ACT 2601, Australia. Contact details (R): tel. +61-7-3406-6047; fax. +61-7-3896-9624; email roger.jaensch@epa.qld.gov.au.

2. Sheet last modified: September 2002.

3. Country: Australia

4. Name of Ramsar site: Elizabeth and Middleton Reefs Marine National Nature Reserve

5. Map of site included? Hard copy and digital (electronic) format

6. Geographical coordinates:

Elizabeth Reef is at latitude 29 degrees 56' S and longitude 159 degrees 05' E. Middleton Reef is at latitude 29 degrees 27' S and longitude 159 degrees 07' E.

7. General Location:

Elizabeth and Middleton Reefs Marine National Nature Reserve is located in the northern Tasman Sea, 630 km east of Coffs Harbour, New South Wales, and 690 km east-south-east of Brisbane (population more than 1.0 million), Queensland. The Reserve is within the Coral Sea Islands Territory, and is administered by the Commonwealth of Australia.

8. Elevation:

Wetland areas within the site are situated at, and several metres below, mean sea level. Sand cays within the site have an elevation (variable) of only one or two metres.

9. Area: 188,000 ha.

The site boundary corresponds to the boundary of Elizabeth and Middleton Reefs Marine National Nature Reserve. The area of reef wetland within the Reserve is estimated to be 8,800 ha, of which approximately 5,100 ha is located at Elizabeth Reef and 3,700 ha is located at Middleton Reef. For both reefs, the estimated area of wetland includes some water more than 6.0 metres deep at low tide.

10. Overview:

Elizabeth and Middleton Reefs are the southernmost coral atolls in the world. Their coral structures occur atop isolated, oceanic sea mounts and are influenced both by tropical and temperate ocean currents. The Reefs support a diverse marine fauna including uncommon and undescribed fish, several endemic species of mollusc, and provide the only habitat for these species in a vast area of ocean.

11. Ramsar Criteria: 1, 2, 3, 4, 8,

12. Justification of criteria under point 11:

Criterion 1: There has been no formal inventory of wetlands throughout the Tasman Sea and a biogeographic regionalisation for Australia's oceanic territory has not been finalised. However, Elizabeth and Middleton Reefs may be considered as both rare and representative examples of coral reef wetland in this oceanic region as they are among the few, and largest, present. Furthermore, these reefs are distinctive in occurring atop oceanic sea mounts; they are the southern-most open-ocean platform reefs in the world (Environment Australia 2002a). They represent an environment not present elsewhere in Australian waters, and are a unique coral reef community (ANPWS 1992, pp. xvii, 111).

Criterion 2: Green Turtle (*Chelonia mydas*) occurs in waters around the Reefs (ANPWS 1992). There is insufficient sand habitat for nesting by this species at the site and no assessment of its population within the site has been conducted. Green Turtle is listed as vulnerable under Australian Commonwealth legislation (*Environment Protection and Biodiversity Conservation Act 1999*), is classified as endangered on the IUCN Red List, and is protected under the Convention on the International Trade of Endangered Species of Wild Animals (CITES) to which Australia is a signatory.

Criterion 3: There has been no formal inventory of wetland biodiversity throughout the Tasman Sea; however, in view of the

rarity of reef habitat in this oceanic region and the moderately large number of marine animal species and diversity of faunal groups recorded at the site (ANPWS 1992), the Reefs represent a 'hotspot' of biological diversity in the region (Ramsar Convention 2002). To date, 314 fishes belonging to 174 genera and 75 families have been provisionally recorded at the Reefs, compared to only half or less this number of species at other Tasman Sea islands (ANPWS 1992, p. 90). Furthermore, seven undescribed and thus potentially endemic fishes have been recorded at the Reefs (ANPWS 1992, pp. 92-3). The limited scientific investigations to date have yielded approximately 122 species of corals, 122 species of crustacean, 240 species of mollusc and 74 species of echinoderm (ANPWS 1992), and further surveys would be expected to yield much higher numbers of species. Of the mollusc species collected, 3% are endemic and many of these are numerically dominant at the site (ANPWS 1992).

Criterion 4: Populations of Black Cod (*Epinephelus daemeli*) on the Elizabeth-Middleton Reefs are important to survival and protection of this species; in the past, spear-fishing has posed a large threat to populations here and on the east coast of Australia. Furthermore, the coral reefs of the site, together with those of Lord Howe Island, provide the only habitat within an extensive area of ocean for a diverse community of sedentary reef-inhabiting animals. In addition, at least 12 species of migratory waterbirds use the Reefs as resting places. These are mostly terns such as Sooty Tern (*Sterna fuscata*) and boobies such as Masked Booby (*Sula dactylatra*), and some shorebirds such as Ruddy Turnstone (*Arenaria interpres*) (ANPWS 1992, p. 93). A small breeding colony of 30 pairs of Common Noddy (*Anous stolidus*) has been documented on a shipwreck on Middleton Reef. The Reefs potentially provide rare shelter for other species during severe storms.

Criterion 8: It can be assumed that the productive shallow waters of the Reefs provide a significant nursery area for fishes that have open-water adult stages (Ramsar Convention 2002). The Rosy Job Fish (*Aprion virescens*), which is commercially harvested on shallow sea mounts in the Tasman Sea, may also depend upon the reef system, although this has not yet been investigated (ANPWS 1992, p. 110). Migratory Bigeye Tuna (*Thunnus obesus*) also aggregate near the reefs in this region.

13a. Biogeographic region: Not applicable

13b. Biogeographic regionalisation scheme:

Environment Australia 2000. Revision of the Interim Biogeographic Regionalisation of Australia (IBRA) and the Development of Version 5.1. - Summary Report. Department of Environment and Heritage, Canberra.

14. Physical Features:

The Reefs are 50 km apart, separated by deep ocean, and are situated atop separate volcanic sea mounts that rise steeply from the Lord Howe Rise. Though more than 20 volcanic peaks are known in the Tasman Sea, only Lord Howe Island and Elizabeth and Middleton Reefs are presently above sea level. It is thought that volcanic activity occurred between the Eocene and Miocene geological periods, and that reefs have existed on the two peaks for some time (Environment Australia 2002b).

Elizabeth Reef is an open-ocean platform coral reef roughly oval in shape, approximately 8.2 km by 5.5 km. Its lagoon is considerably infilled by reticulated reefs that form a mesh reef complex with the sandy bottom. Water depths of 20-30 metres are common in this area, while the western end of the lagoon is generally shallower (2-3 m). Along the southern inner margin of the reef, a reticulated reef flat has developed consisting of a fragile non-living pavement derived from coralline algae, with live, active sides. This grades into the generally smooth pavement of the outer reef flat. In places, the outer reef flat is dotted with large boulders which are thought to have been thrown up from the reef slope where there is an extensive high-energy surf zone with well developed and extensive surge channels, gutters, sink holes and groove-spur development. The reef slopes show little leeward/windward differentiation, suggesting that winds do not prevail from any particular direction. The reef slope is being eroded by wave action, suggesting a gradual reduction in the size of the reef (Environment Australia 2002b).

Middleton Reef is an open-ocean platform coral reef roughly kidney-shaped, approximately 8.9 km by 6.3 km. Its lagoon is structurally complex with areas of relatively deep water in the centre and at the eastern end of the main lagoon. Isolated patch reefs with a high percentage of fragile, living corals occur at the western end of the lagoon. The lagoon floor consists of very fine

silt, indicating that minimal tidal flushing occurs. Towards the south of the lagoon, patch reefs become increasingly reticulated, finally fusing to form a pavement-like inner reefal margin of coralline algae. This margin forms the boundary of the outer reef flat which is bisected by a moat in which occurs a porous, fragile 'pie crust' of live coral. Sand patches occur towards the eastern end of the moat. The seaward margin of the reef flat is formed by a hard algal ridge. Both algal ridge and reef flat are exposed at low tide. At the only entrance to the lagoon, on the northern side of the reef, a back reef environment has developed and is characterised by large patch reefs dominated by *Acropora* and *Seriatopora* coral species (Environment Australia 2002b).

In summer, the Reefs receive warm tropical water from the East Australian Current, which apparently sustains the reef growth. Although the Reefs remain continually in the path of the Tropical Convergence, in winter cooler water from the Southern Ocean reaches the Reefs via the dominant West Wind Drift. Therefore, coral growth and erosion are probably seasonal and delicately balanced.

Tides are semi-diurnal, modified by local wind and currents; monthly tidal maxima range from 1.8 to 2.6 m and minima range from 0 to 0.2 m (ANPWS 1992). Surface seawater temperatures vary seasonally between 20 to 25 degrees C (ANPWS 1992).

There are no rainfall data for the site but data at Lord Howe Island (150 km to the south), may broadly indicate conditions at Elizabeth and Middleton Reefs. Monthly averages at Lord Howe range from 108 mm in February to 184 mm in July. Air temperatures range from maximum of 25 degrees C in summer to minimum of 14 degrees C in winter.

The Reefs lie at latitudes just within the southern-most zone of influence of destructive tropical cyclones.

15. Catchment Area: Not applicable

16. Hydrological Values:

As isolated oceanic wetlands with no permanent dry land, the Reefs have no hydrological value with regards to this information category.

17. Wetland Type: C (coral reefs), E (sand, shingle or pebble shores)

18. Ecological Features:

Elizabeth and Middleton reefs have a restricted number of habitats, for instance there is a complete lack of leeward or outer reef slopes protected from the wind. However, the reefs can be divided into three major habitats: outer exposed reef slope which is deeply dissected by spurs and grooves, and which, below 30m, drops off rapidly into deeper water; reef crest which is exposed at low tide; shallow protected lagoon with well developed patch reefs that coalesce to form a reticulated reefal structure around the margins of the lagoon. The reef areas do not support terrestrial plant communities. Coral communities, sandy lagoons and algal meadows (encrusting or turf algae) form the dominant structural components and ecological features of the site, and these are described within Item 14. Seagrass, (*Halophila ovalis*), has a small patchy distribution on the sheltered sandy lagoons at both Reefs. The Reefs also support an extremely rich and diverse algal flora (see Item 17).

19. Noteworthy Flora:

No terrestrial plants occur at present (see item 18), though there is evidence that the sandy cay was vegetated with grass in the recent past (Environment Australia 2002b). A preliminary survey revealed that the Reefs have a rich and diverse algal flora: to date 18 taxa have been identified, and the remoteness of the site suggests a high potential for genetic uniqueness. The only seagrass recorded is *Halophila ovalis* (ANPWS 1992, p. 97).

20. Noteworthy Fauna:

Threatened species: the globally endangered Green Turtle (*Chelonia mydas*) occurs in waters around the Reefs (ANPWS 1992). See Item 12, Criterion 2.

Other noteworthy fauna: the Reefs support one of the only remaining large populations of Black (Saddle) Cod (*Epinephelus daemeli*), which is protected in Commonwealth and New South Wales waters (ANPWS 1992). This fish is a large, slow-growing, sedentary, reef-dwelling serranid that occurs in seas of the south-western Pacific including south-eastern Australia. World-wide, most members of its genus are in demand for human consumption. The Reefs also provide the southernmost habitat for the Queensland Giant Groper (*Epinephelus lanceolatus*) (Environment Australia 2002a), which in Queensland receives a medium level of legislative protection.

Three mollusc species are endemic to the site (*Anabathridae Amphithalamus sp. nov.*; *Retusidae Decorifer elisa*; *Mytilidae Musculus nubilis*) and seven are endemic to the group of islands in this part of the Tasman Sea. Most of these endemics are abundant on both reefs, but many of the species with much wider geographic distributions are rare at the site.

21. Social and Cultural Values:

Many ships have been wrecked on the Reefs, dating back to the earliest years of European settlement in Australia in the late 18th Century, making the area of considerable marine archaeological significance. Remains of several wrecks are a conspicuous feature of the site. Shipwrecks located within the Reserves are protected under the *Historic Shipwrecks Act 1976* if they are more than 75 years old. The wreck, Fuku Maru, on Middleton Reef supports a small breeding colony of sea terns. Owing to lack of suitable dry land, the colony otherwise would not occur at the site.

22. Land tenure/ownership:

a) Site: The site is a National Nature Reserve owned by the Commonwealth Government of Australia. b) Surrounding area: Oceanic waters surrounding the Reserve are within the Exclusive Economic Zone of Australia of which the Elizabeth and Middleton reefs form part.

23. Current land use:

a) Site: Nature conservation and scientific research; also limited recreational diving and fishing; no resident human population is present on or near the site. b) Surroundings/catchment: Surrounding areas support commercial, demersal long-line fisheries based on Blue-eye Trevella (*Hyperglyphe antarctica*) and Rosy Job Fish (*Aprion virescens*).

24. Factors adversely affecting ecological character (past, present, potential):

Past/present: No exotic species have been observed at the Reefs, and occasional visitation by humans is believed to be largely benign. However, the Crown-of-thorns Starfish (*Acanthaster planci*) has been quite common and widespread on the reefs and may be responsible for recent reduction in live coral cover, as it is on the Great Barrier Reef (ANPWS 1992).

Potential: Under present management plans, a number of potentially detrimental activities are not permitted (see Item 23). However, oil spills associated with shipwrecks, anchoring and diving do represent potential threats to the Reefs.

25. Conservation measures taken:

Elizabeth and Middleton Reefs Marine National Nature Reserve was proclaimed in December 1987 and is subject to provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. It is a Category 1a Nature Reserve under international IUCN classification, as it is managed primarily for scientific research and environmental monitoring. The second Management Plan for the Reserve came into effect in March 1994 and applies for ten years (Environment Australia 2002b). The main objectives of the Reserve are to protect the natural communities and species and to maintain and protect natural processes in an undisturbed state. Activities such as scientific research, dive charter tours and other commercial activities are allowed, but are managed through the use of permits. Staff from Environment Australia undertake on average one management patrol per year to the Reserve, generally using Royal Australian Navy patrol boats or Customs vessels for transport and support. Commercial fishing and operations for the recovery of minerals are not permitted whilst the current Plan is in effect.

26. Conservation measures proposed:

Environment Australia is currently developing a formal monitoring program for the Reserve for some species and habitat parameters. A new Management Plan will also be completed for the Reserve in 2005.

27. Current scientific research and facilities:

The Reefs have been visited by a number of scientific expeditions, notably that of the Australian Museum in December 1987 (ANPWS 1992). Due to the remote location and lack of permanent dry land, research opportunities are limited and no permanent field station exists at the Reefs. However, staff from Environment Australia undertake observations of key features during management patrols to the Reserve and are developing a formal monitoring program for some habitat parameters and species, including Black Cod.

28. Current conservation education:

Due to the remote location and limited land area, the Reefs are not suitable for visitor education programs or static educational displays. Detailed information on the Reefs, including the Management Plan, photographs, and a brochure are available on the Internet (Environment Australia 2002a).

29. Current recreation and tourism:

Due to the remote location and limited land area, the Reefs are not convenient or popular destinations for recreation or tourism. Recreational and commercial dive and/or fishing charter tours and cruise ships have visited the Reefs in the past. However, no permits for commercial activities in the Reserve have been requested of, nor issued by, Environment Australia in recent times.

30. Jurisdiction &

31. Management authority:

The Reserve is within the Coral Sea Islands Territory and falls under the jurisdiction of the Commonwealth Government of Australia. Functional jurisdiction lies with the Director of National Parks, Department of Environment and Heritage, Canberra. The Reserve is managed by the Marine Protected Areas Section, Marine Division, Department of the Environment and Heritage, GPO Box 787, Canberra ACT 2601, Australia.

32. Bibliographical references:

ANPWS (ed. P. Hutchings) (1992) Reef Biology: A survey of Elizabeth and Middleton Reefs, South Pacific, by The Australian Museum. Kowari 3 (series), Australian National Parks & Wildlife Service, Canberra. 230 pp.

Environment Australia (2002a) Elizabeth and Middleton Reefs Marine National Nature Reserve. [Online], <http://www.ea.gov.au/coasts/mpa/elizabeth/index.html>, 20 June 2002.

Environment Australia (2002b) Elizabeth and Middleton Reefs Marine National Nature Reserve Plan of Management. [Online], <http://www.ea.gov.au/coasts/mpa/elizabeth/plan.html>, 4 June 2002.

Ramsar Convention (2002) Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance of the Convention on Wetlands. [Online], http://www.ramsar.org/key_guide_list_e.htm, 4 June 2002.

Appendix 5: EPBC Regulations, Schedule 6 Managing wetlands of international importance (regulation 10.02) (extract)

1 General principles

- 1.01 The primary purpose of management of a declared Ramsar wetland must be, in accordance with the Ramsar Convention:
 - (a) to describe and maintain the ecological character of the wetland; and
 - (b) to formulate and implement planning that promotes:
 - (i) conservation of the wetland; and
 - (ii) wise and sustainable use of the wetland for the benefit of humanity in a way that is compatible with maintenance of the natural properties of the ecosystem.
- 1.02 Wetland management should provide for public consultation on decisions and actions that may have a significant impact on the wetland.
- 1.03 Wetland management should make special provision, if appropriate, for the involvement of people who:
 - (a) have a particular interest in the wetland; and
 - (b) may be affected by the management of the wetland.
- 1.04 Wetland management should provide for continuing community and technical input.

2 Management planning

- 2.01 At least 1 management plan should be prepared for each declared Ramsar wetland.
- 2.02 A management plan for a declared Ramsar wetland should:
 - (a) describe its ecological character; and

- (b) state the characteristics that make it a wetland of international importance under the Ramsar Convention; and
- (c) state what must be done to maintain its ecological character; and
- (d) promote its conservation and sustainable use for the benefit of humanity in a way that is compatible with maintenance of the natural properties of the ecosystem; and
- (e) state mechanisms to deal with the impacts of actions that individually or cumulatively endanger its ecological character, including risks arising from:
 - (i) physical loss, modification or encroachment on the wetland; or
 - (ii) loss of biodiversity; or
 - (iii) pollution and nutrient input; or
 - (iv) changes to water regimes; or
 - (v) utilisation of resources; or
 - (vi) introduction of invasive species; and
- (f) state whether the wetland needs restoration or rehabilitation; and
- (g) if restoration or rehabilitation is needed — explain how the plan provides for restoration or rehabilitation; and
- (h) provide for continuing monitoring and reporting on the state of its ecological character; and
- (i) be based on an integrated catchment management approach; and
- (j) include adequate processes for public consultation on the elements of the plan; and
- (k) be reviewed at intervals of not more than 7 years.

- 3 Environmental impact assessment and approval
 - 3.01 This principle applies to the assessment of an action that is likely to have a significant impact on the ecological character of a Ramsar wetland (whether the action is to occur inside the wetland or not).
 - 3.02 Before the action is taken, the likely environmental impact of the action on the wetland's ecological character should be assessed under a statutory environmental impact assessment and approval process.
 - 3.03 The assessment process should:
 - (a) identify any part of the ecological character of the wetland that is likely to be affected by the action; and
 - (b) examine how the ecological character of the wetland might be affected; and
 - (c) provide adequate opportunity for public consultation.
 - 3.04 An action should not be approved if it would be inconsistent with:
 - (a) maintaining the ecological character of the wetland; or
 - (b) providing for the conservation and sustainable use of the wetland.
 - 3.05 Approval of the action should be subject to conditions, if necessary, to ensure that the ecological character of the wetland is maintained.
 - 3.06 The action should be monitored by the authority responsible for giving the approval (or another appropriate authority) and, if necessary, enforcement action should be taken to ensure compliance with the conditions.

Appendix 6

Ships and other vessels known to have been wrecked on Elizabeth and Middleton Reefs

Britannia - 301 ton whaler

Fully rigged en route to London the *Britannia* struck a reef at about 2 am on 25 August 1806. The crew left the wreck in three boats. One boat disappeared during a gale and the eight crew on board presumably perished. The remaining two boats arrived at Newcastle on 8 September with what was probably the first reference to Elizabeth Reef.

Elizabeth - 140 ton brig

The *Elizabeth* left Sydney for New Zealand in February, 1831. It was later found wrecked on Elizabeth Reef. Its crew was never found.

Stirling Castle

According to Bell (1905) the *Stirling Castle* was wrecked in 1836 on Elizabeth Reef. Other sources suggest that she was wrecked further north.

Rosetta Joseph - 265 ton barque

This ship was wrecked on Elizabeth Reef on 1 December 1850, while returning to Sydney from San Francisco. The 15 crew and 32 passengers reached Port Macquarie in the ship's boats on 10 December.

Tyrian - 226 ton barque

While sailing from Honolulu to Sydney, via Auckland, the *Tyrian* struck Elizabeth Reef on 24 November 1851. Fifteen persons set out in a long boat, leaving another 33 on board the *Tyrian*. The long boat arrived in Newcastle on 12 December and the 33 who remained on board were subsequently rescued by the whaler, *Jane*, and *HMS Archeron*.

Mary Catherine

Wrecked in 1851 on Middleton Reef.

Agnes Napier - 35 ton schooner

Wrecked on Middleton Reef during a storm on 1 November 1855.

Stuart Russell - barque
Wrecked in 1856 on Middleton Reef.

Packet - 183 ton whaling brig
The *Packet* struck Elizabeth Reef on 24 February 1857 during a gale. The crew of 26 set off in the ship's boats for the Richmond River but were picked up by a passing ship.

Blue Jacket - 74 ton schooner
The *Blue Jacket* was last seen in 1857 near Middleton Reef en route to Sydney from Noumea. It is presumed to have been wrecked on the reef.

Defender - 1300 tons
While sailing from Puget Sound to Sydney with a cargo of timber and salmon, this American ship was wrecked on Elizabeth Reef on 27 February 1859. The crew set off in three boats and eventually reached the NSW coast, where one seaman drowned in the surf.

Constitution
This American ship was supposedly lost in 1859 on Middleton Reef.

Mary Lawson - 432 ton barque
The *Mary Lawson* was wrecked on Middleton Reef on 10 June 1866 en route to Shanghai from Sydney. The Captain, his wife and nine of the crew were lost. Four surviving crew sailed a lifeboat to the Clarence River, where one of the crew drowned in the surf.

Douglas - 380 ton barque
While sailing from Newcastle to Yokohama the *Douglas* struck Elizabeth Reef in heavy seas on 8 May 1869. The crew set off on a raft and were later rescued by the *Storm Bird*.

Colonist - schooner
The *Colonist* was wrecked on Elizabeth Reef without loss of life on 1 January 1870.

Queen of the East - 1275 tons
While sailing from San Francisco to Newcastle for a cargo of coal, this ship struck Middleton Reef on 18 April 1872.

Alma - 163 ton barquentine
The *Alma* struck Elizabeth Reef on 3 August 1883 while carrying a cargo of timber from New Zealand to Rockhampton.

Ramsay - 767 ton barque

Eleven seamen died when this vessel was wrecked on Elizabeth Reef in heavy seas on 31 October 1883. The survivors launched the ship's boats and were eventually rescued.

Naiad - 292 ton brig

The *Naiad* was wrecked on Elizabeth Reef on 9 July 1885 while on a voyage from New Caledonia to Sydney. Some of the crew reached Lord Howe Island whereupon the *Mary Ogilvie* was sent to rescue the remainder of the crew.

Mallsgate - 1073 ton barque

While sailing from Newcastle to San Francisco loaded with 1513 tons of coal, the *Mallsgate* struck Middleton Reef on 21 July 1889.

Annasona - 1430 ton steel barque

While en route from Peru to Australia, the *Annasona* struck Middleton Reef on 18 January 1907. The crew managed to reach Lord Howe Island. Subsequently the wreck was used to store emergency provisions for survivors of future shipwrecks.

Maelgwyn - 1276 ton barque

The *Maelgwyn* was abandoned, dismasted and sank off Middleton Reef in 1907. The crew reached Lord Howe Island safely.

Errol - barque

The *Errol* was wrecked on Middleton Reef on 18 June 1909 while sailing from Peru to Newcastle. Several of the crew drowned at the time of the accident but the remainder sought shelter on the wreck of the *Annasona*. Subsequently, the master, his wife and their four children perished, along with several more of the crew. On 12 July 1909, 5 crew members were rescued - all that remained of the complement of 22.

Askoy - 1600 tons

The *Askoy* was wrecked on Elizabeth Reef without loss of life on 27 December 1911.

Runic - 13500 tons

This New Zealand meat freighter ran onto Middleton Reef during February 1961. The wreck remains visible for several miles and is easily picked up on radar.

Fuku Maru - tuna boat

This Japanese vessel ran aground in 1963 on Middleton Reef during high seas. It has been used as a food cache and shelter for shipwreck survivors.

Kaineo Maru - 180 ton tuna boat

The *Kaineo Maru* was wrecked on Elizabeth Reef on 20 January 1969. It has also been referred to as the Yoshin Maru-Iwaki, making its positive identity unclear.

One-and-All - ketch

One-and-All was wrecked in 1971 near Middleton Reef without loss of life.

Japanese steel trawler/longliner

Wrecked in 1972 on Middleton Reef.

Sospan Foch - sloop

The four crew of this New Zealand vessel spent six weeks awaiting rescue sheltering in the Fuku Maru after running onto Middleton Reef in 1974.

Josephine II - racing sloop

A lone yachtsman survived a prolonged journey in a life raft after striking Middleton Reef during a 1978 trans-Tasman race.

Monray Frontier - fibreglass longliner

Wrecked in 1998 on Middleton Reef.