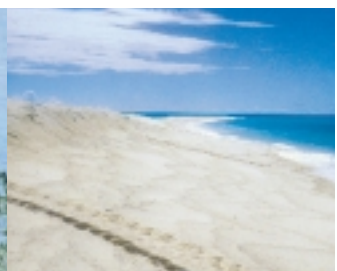


Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve



M A N A G E M E N T P L A N S



Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve



M A N A G E M E N T P L A N S

*This is the first Management Plan for Cartier Island
Marine Reserve and the second Management Plan for
Ashmore Reef National Nature Reserve*

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Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve
(Commonwealth Waters) Management Plans

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Cover images

Large image: Flock of Noddies at Ashmore Reef National Nature Reserve.
Photographer: Graeme Beech.

FOUR SMALL IMAGES FROM LEFT TO RIGHT:

1. Brown Booby. *Photographer: Kriton Glenn.*
2. Traditional Indonesian fishing vessel.
Photographer: Phil Domaschenz.
3. Marine biologist undertaking reef platform survey at Ashmore Reef National Nature Reserve. *Photographer: Kriton Glenn.*
4. Turtle tracks on beach at Cartier Island.
Photographer: Graeme Beech.

Foreword

Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve (the '**Reserves**') are within Commonwealth waters off the coast of northern Western Australia. Environment Australia (EA) is the Commonwealth's managing authority for the Reserves. The Reserves protect unique and vulnerable marine ecosystems with high biological diversity. The Reserves include reefs which are part of remote reefal systems which provide critical stepping stones for the transportation of biological material from the centres of biodiversity in the Indo-Pacific to the reefal and other inter-dependant ecosystems located along the Western Australian coast.

Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve are 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 and to contribute to the long-term ecological viability of marine systems, to maintain ecological processes and to protect Australia's biological diversity at all levels. Accelerated development of the NRSMPA is a specific action of *Australia's Oceans Policy* launched by the Commonwealth Government in December 1998.

Management planning for the Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve is designed to conform to the *Best Practice in Performance Reporting in Natural Resource Management* (ANZECC 1997), with an emphasis on strategic objectives, management goals and strategies, and performance assessment. The performance assessment framework will generally follow that set out in the *Strategic Plan of Action for the National Representative System of Marine Protected Areas – A Guide for Action by Australian Governments* (ANZECC 1999).

The management plans for the Reserves have been prepared under provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and meet all the statutory

requirements for a management plan under that Act. The EPBC Act allows for the management plans for different reserves to appear in one document. Given the close proximity of the Reserves, the similar nature of the threats they face and the management goals and strategies required, the management plans for the Reserves have been combined in one document (the 'Plan'). The Plan contains the first management plan for Cartier Island Marine Reserve, and the second management plan for Ashmore Reef National Nature Reserve.

As required by the EPBC Act, the Plan assigns an IUCN (World Conservation Union) category to the Reserves, and in the case of Ashmore Reef National Nature Reserve to each of the zones of the Reserve. Cartier Island Marine Reserve is not divided into zones by the Plan. The overall category of both Reserves is IUCN category Ia – strict nature reserve. Such reserves are managed primarily to ensure habitats, ecosystems and native species are preserved in an undisturbed state and to facilitate research.

As required by the EPBC Act, the Plan provides for the protection and conservation of the Reserves and states how the Reserves will be managed. The Plan describes the conservation and cultural values of the Reserves, the pressures on these values, and a management regime to ensure these values are protected. A framework for compliance and enforcement and for assessing the performance of the management of the Reserves is provided.

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

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Acknowledgments

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Contents

Foreword	iii
Acknowledgments	v
Glossary	ix
1. Introduction	1
2. Management Framework	8
2.1 National context	8
2.2 International context	8
2.3 Legislative context	10
2.4 IUCN protected area management category of the Reserves	13
2.5 Management of the Reserves	14
3. Strategic Objectives	16
4. Description of Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve	17
4.1 Location	17
4.2 Physical features and processes	17
Geomorphology	17
Oceanography	18
Climate	19
4.3 Ecological values of the Reserves	19
Biological diversity	19
Marine habitats	20
Marine vertebrates	20
Marine invertebrates	22
Terrestrial habitats and flora	23
Terrestrial fauna	23
4.4 Cultural values	24
History	24
Indonesian artefacts	26
European wrecks	26
5. Reserve Uses and Pressures	27
5.1 Traditional fishing	27
5.2 Unauthorised boat arrivals	29
5.3 Tourism and recreation	30
5.4 Research	30

5.5	Australian commercial fishing	31
5.6	Mining operations	32
5.7	Shipping	33
5.8	Buildings and other structures	33
5.9	Other commercial activities	33
5.10	Pollution	34
6.	Managing Ashmore Reef National Nature Reserve and Cartier Island Marine Reserves	36
6.1	Access	41
6.2	Cultural values	43
6.3	Traditional fishing	43
6.4	Unauthorised boat arrivals	46
6.5	Tourism and recreation	47
6.6	Research	49
6.7	Australian commercial fishing	51
6.8	Mining operations	52
6.9	Buildings and other structures	53
6.10	Filming and other commercial activities	54
7.	Compliance and Monitoring	55
7.1	Compliance and enforcement	55
7.2	Performance assessment	56
7.3	Reviewing the Plan	57
	Bibliography	58
	Attachments	
1	Memorandum of Understanding between Australia and Indonesia 1974 (as reviewed in 1989)	63
2	Proclamation of Ashmore Reef National Nature Reserve	71
3	Proclamation of Cartier Island Marine Reserve	72
4	Some species present in Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve protected under the EPBC Act as listed marine species (section 248)	74
5	Some Commonwealth Legislation relevant to this Plan	76
6	Instrument of Prohibition of access to areas of Ashmore Reef National Nature Reserve	78
7	Australian Reserve Management Principles relevant to the Reserves	81

List of Figures

1	Location of Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve within the area covered under the Memorandum of Understanding between Australian and Indonesia (the MOU Box) in the Indian Ocean.	4
2	Location of Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve	5
3	Boundary of Ashmore Reef National Nature Reserve	6
4	Boundary of Cartier Island Marine Reserve	7
5	Areas closed to the public at Ashmore Reef National Nature Reserve	38–39

List of Tables

1	Potential and existing pressures on major values of the Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve	35
2	Summary of activities regulated in Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve	40

Glossary

AFMA	Australian Fisheries Management Authority
AGSO	Australian Geological Survey Organisation
AIMS	Australian Institute of Marine Science
ANZECC	Australian and New Zealand Environment and Conservation Council
Bonn Convention	Convention on the Conservation of Migratory Species of Wild Animals
CAMBA	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 (China-Australia Migratory Bird Agreement).
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DIMA	Department of Immigration and Multicultural Affairs
Director	Director of National Parks under the EPBC Act
DISR	Department of Industry, Science and Resources
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPBC Regulations	Environment Protection and Biodiversity Conservation Regulations 2000 made under the EPBC Act

ER(CP) Act	<i>Environmental Reform (Consequential Provisions) Act 1999</i>
IMCRA	Interim Marine and Coastal Regionalisation for Australia
IUCN	World Conservation Union (previously International Union for the Conservation of Nature and Natural Resources)
JAMBA	Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (Japan–Australia Migratory Bird Agreement)
MOU	Memorandum of Understanding
MOU Box	An area of the eastern Indian Ocean subject to an MOU between Australia and Indonesia signed in 1974 and reviewed in 1989
MPA	Marine Protected Area
NPWC Act	<i>National Parks and Wildlife Conservation Act 1975</i>
NPWC Regulations	National Parks and Wildlife Conservation Regulations 1975, made under the NPWC Act
NRSMPA	National Representative System of Marine Protected Areas
Ramsar Convention	Convention on Wetlands of International Importance (Ramsar, Iran, 1971)
The Plan	Ashmore Reef National Nature Reserve Management Plan and Cartier Island Marine Reserve Management Plan
The Reserves	Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve
UNCLOS	United Nations Convention on the Law of the Sea



1. Introduction

Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve (the 'Reserves') lie off the coast of northern Western Australia in the eastern Indian Ocean (Figures 1 and 2).

Located in Australia's External Territory of Ashmore and Cartier Islands, the Reserves are under the jurisdiction of the Commonwealth of Australia. They are within an area subject to a Memorandum of Understanding (MOU) between Indonesia and Australia (Attachment 1), which provides for continued Indonesian traditional fishing activities in an area known as the MOU Box (Figure 1).

The Reserves were established by the Commonwealth for the purposes of protecting their outstanding and representative marine ecosystems and to facilitate scientific research. Ashmore Reef National Nature Reserve was established on 16 August 1983 (see Figure 2 and Attachment 2). Cartier Island Marine Reserve was established on 21 June 2000 (See Figure 3 and Attachment 3).

The Reserves were established by proclamations under the *National Parks and Wildlife Conservation Act 1975*, which was replaced by the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 16 July 2000. The proclamations of the Reserves are continued by the *Environmental Reform (Consequential Provisions) Act 1999* (ER(CP) Act) as if they had been made under the EPBC Act, and as if the proclamations stated that the purposes for which the Reserves were declared were: 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.

The Reserves protect biologically diverse reef systems of Australia's North West Shelf, and are in the Oceanic Shoals Bioregion. The Oceanic Shoals Bioregion is described in the *Interim Marine and Coastal Regionalisation for Australia: an Ecosystem-based Classification for Marine and Coastal Environments* (IMCRA Technical Group 1998).

The Reserves have international significance due to their high biological diversity, oceanic location, cultural values, and geomorphological make up. Ashmore Reef National Nature Reserve protects a vital genetic 'bank' for the region (Glenn and O'Brien 1999). Ashmore Reef National Nature Reserve is listed on the Register of the National Estate¹. Ashmore is also included on the World Conservation Union (IUCN) list of Coral Reefs of International Significance.

A number of species in the Reserves are protected under the EPBC Act (Part 13). This includes cetaceans, and listed marine, threatened and migratory species (Attachment 4).

The fauna of the Reserves is considered regionally, and in some cases internationally, significant. A number of species present, such as marine turtles, dugongs, migratory birds and some seabird species are protected under international agreements (Attachment 4). Several species found in the Reserves are on the 1996 IUCN Red List of Threatened Animals. Many bird species found in the Reserves are listed on the Japan–Australia and China–Australia Migratory Bird Agreements (JAMBA and CAMBA).

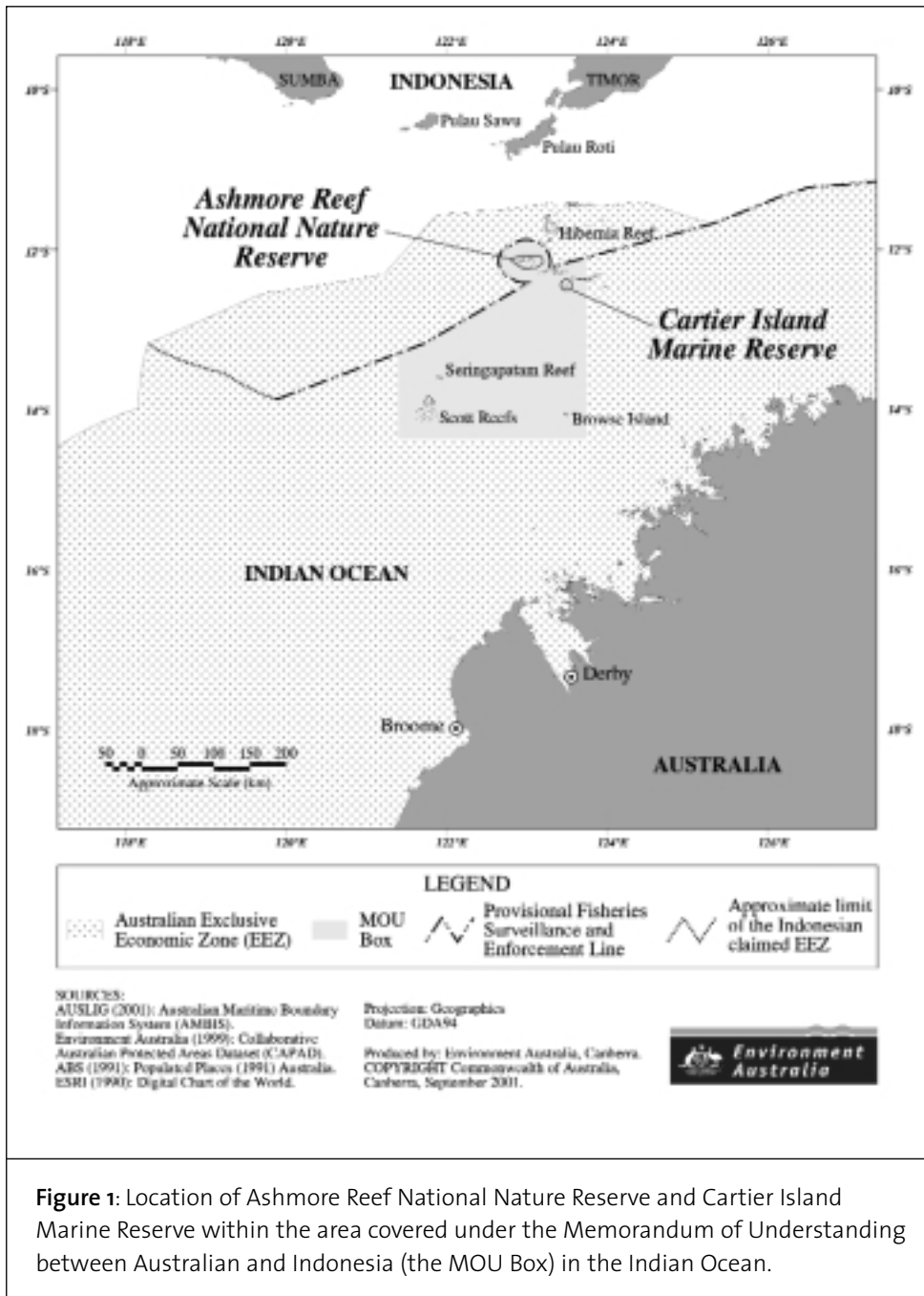
The reefs of the Reserves, along with the nearby Hibernia Reef, are notable for high biodiversity. The Reserves protect critical habitat for an unusually high diversity and abundance of sea snakes (Hanley and Russell 1993), and provide feeding and breeding areas for turtles and critical habitat for dugongs (Whiting *et al.* 1999). Ashmore Reef supports the greatest number of coral species of any reef off the West Australian coast (Veron 1993) and has a rich echinoderm fauna (Marsh *et al.* 1993). It also has the most diverse marine fish fauna of any region in Western Australia (Hutchins 1998). Additionally, the Reserves contain endemic sea snakes and molluscs, and are the largest emergent reef systems in the region.

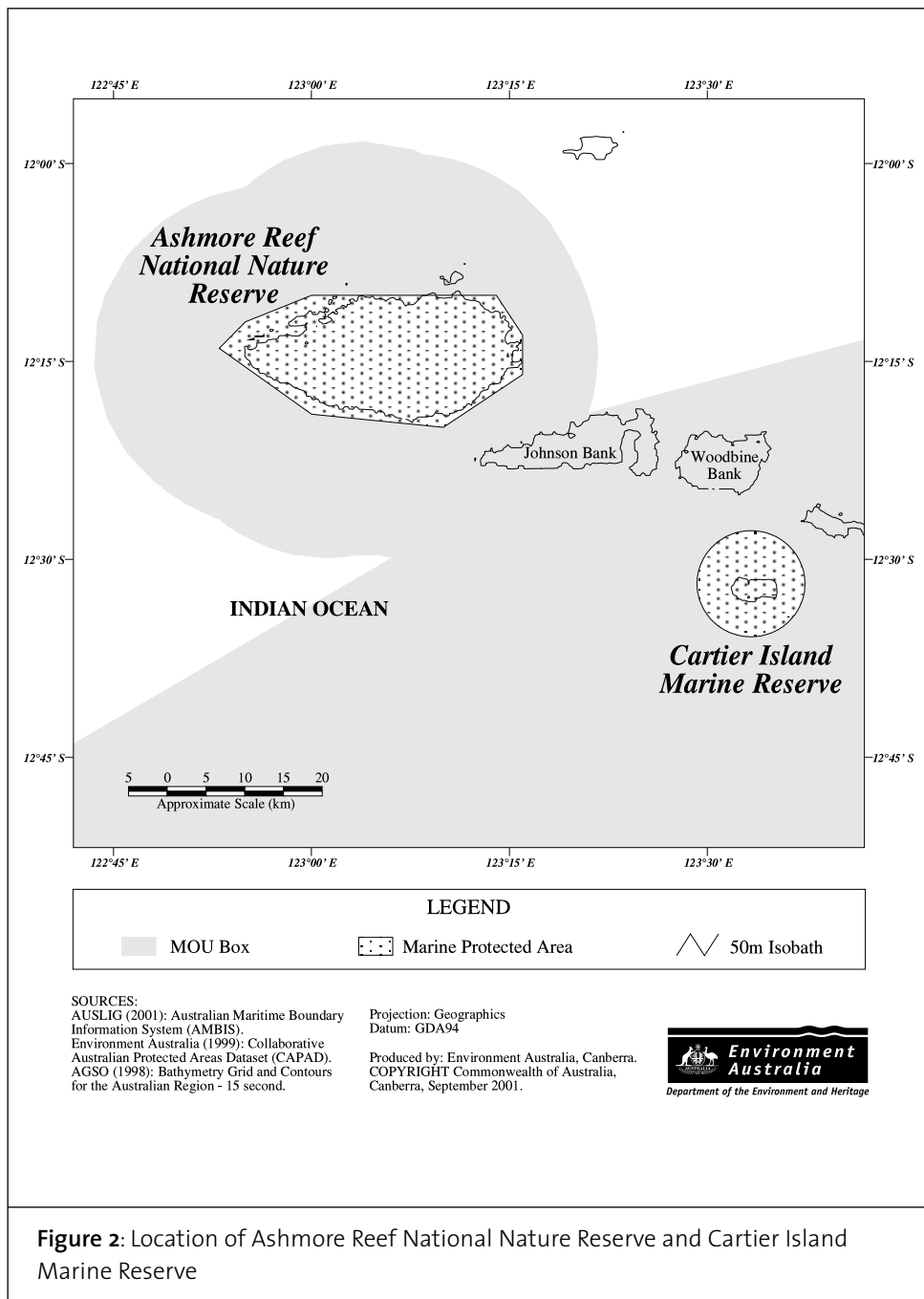
¹ The Register of the National Estate is the register under the *Australian Heritage Commission Act 1975* of those places, being components of the natural environment of Australia or the cultural environment of Australia, that have aesthetic, historic, scientific or social significance or other special value for future generations as well as for the present community

The reefs of the Reserves exhibit high levels of inter-dependency with adjacent ecosystems to the north and south. Along with a limited number of other reefs in the region, Cartier and Ashmore reefs are considered important as biological stepping-stones, facilitating the transport of biological material to the reef systems along the Western Australian coast (Simpson *et al.* 1991). The major southern flowing current that originates in the region, the Leeuwin Current, and its interaction with other currents plays a significant role in the maintenance of coral reef and algal communities further to the south.

The Reserves have historical and cultural significance. In particular, traditional Indonesian fishers have an historic and ongoing cultural and economic association with islands and reefs in the region. Resources of the Reserves have been harvested by Indonesian fishers for hundreds of years. Traditional Indonesian fishers continue to regularly visit Ashmore Reef National Nature Reserve for fresh water, shelter and to visit grave sites.

Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve are small but critical elements of the wider region. Australian government agencies, in cooperation with Indonesian stakeholders, are continuing to look at options for management and research on a regional scale, and to integrate management of Ashmore and Cartier into a broader regional perspective.





SOURCES:
 AUSLIG (2001): Australian Maritime Boundary Information System (AMBIS).
 Environment Australia (1999): Collaborative Australian Protected Areas Dataset (CAPAD).
 AGSO (1998): Bathymetry Grid and Contours for the Australian Region - 15 second.

Projection: Geographics
 Datum: GDA94

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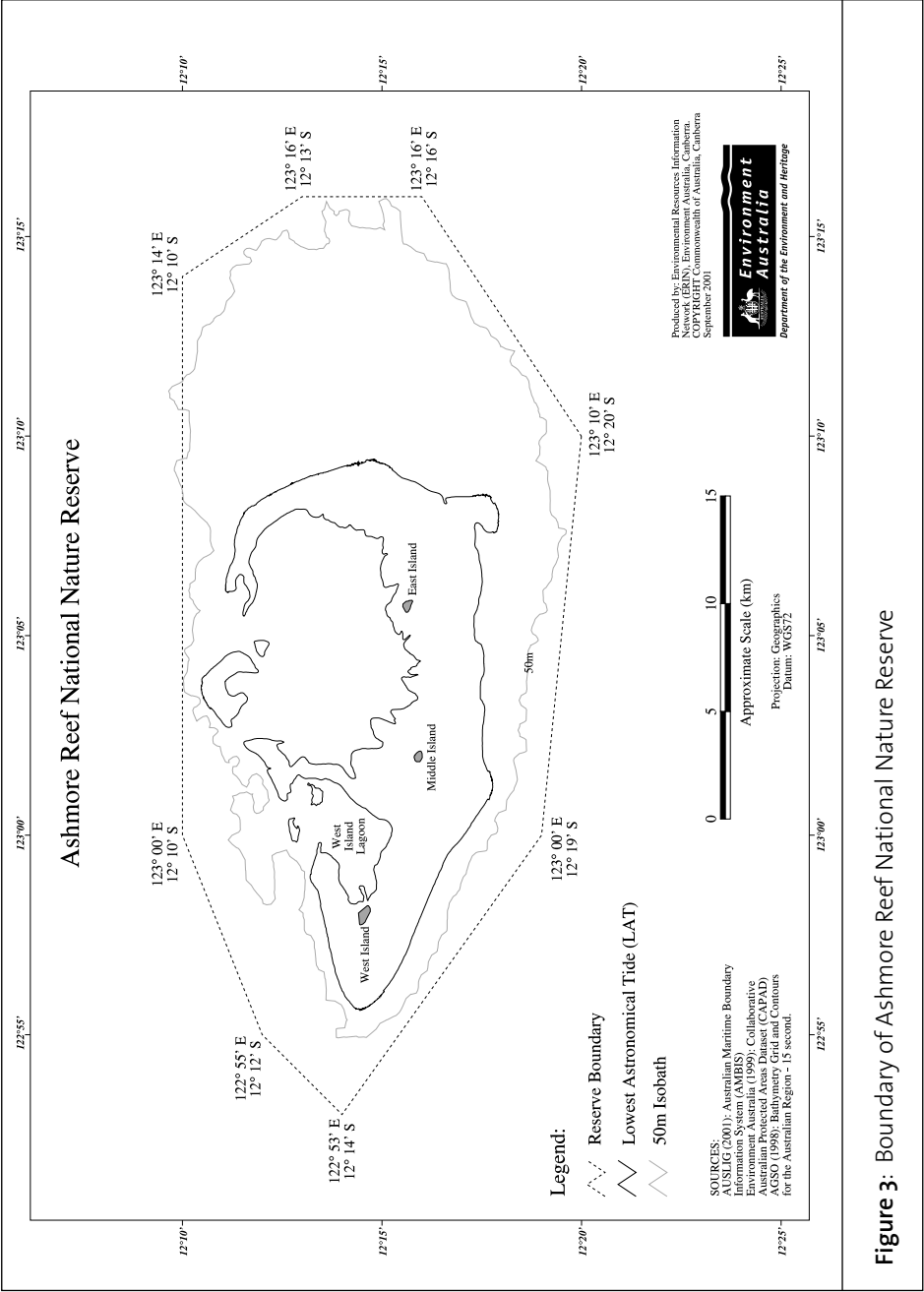
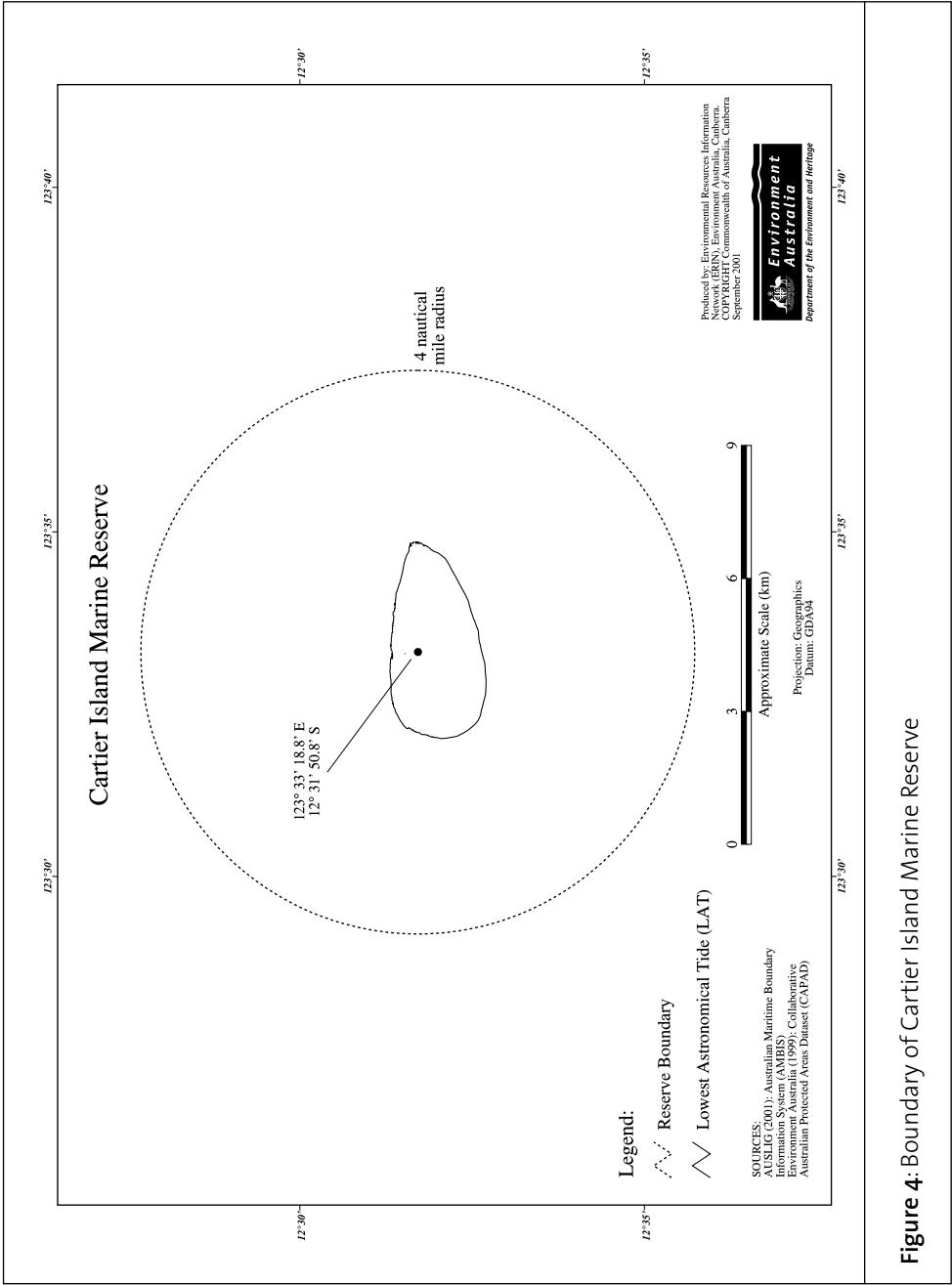


Figure 3: Boundary of Ashmore Reef National Nature Reserve





2. Management Framework

2.1 National context

Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve are part of the National Representative System of Marine Protected Areas (NRSMPA). As described in ANZECC (1999) the NRSMPA aims to:

- establish and manage a comprehensive, adequate and representative system of Marine Protected Areas (MPAs)
- contribute to the long-term viability of marine systems
- maintain ecological processes and systems
- protect Australia's biological diversity at all levels.

MPAs within the NRSMPA have been established principally for the conservation of biological diversity.

The Commonwealth Government's commitment to the NRSMPA was reaffirmed through *Australia's Oceans Policy* (Commonwealth of Australia 1998), which identified the need for integrated ocean planning and management to reduce the risk of progressive decline and irreversible damage to our marine systems. One of the mechanisms to achieve integrated management is the establishment of a system of MPAs with the primary objective of biodiversity conservation.

The Reserves fall within the Oceanic Shoals Bioregion. The Oceanic Shoals Bioregion is described in the *Interim Marine and Coastal Regionalisation for Australia: an Ecosystem-based Classification for Marine and Coastal Environments* (IMCRA Technical Group 1998).

Australian government agencies, in cooperation with Indonesian stakeholders, are continuing to look at options for management and research on a regional scale, and to integrate management of Ashmore and Cartier into a broader regional perspective.

2.2 International context

The Reserves are within Australian Commonwealth waters off the coast of northern Western Australia (see Figure 1). A Memorandum of Understanding (MOU) signed by the Australian and Indonesian governments in 1974, and reviewed in 1989 (Attachment 1), sets out arrangements by which traditional fishers may access marine resources in the region. This MOU allows for continued Indonesian traditional fishing activities in an area known as the MOU Box, which includes the Reserves. The MOU requires parties to cooperate in implementing the prescribed understandings designed to recognise traditional Indonesian fishing activities and protect the marine habitats of the area. Traditional fishing and harvesting activities are restricted within the Reserves (see Chapter 6 of this Plan and Attachment 1).

Protection of the biodiversity of the Reserves assists Australia in meeting its obligations under the *Convention on Biological Diversity* 1992. The Convention requires parties to pursue the conservation of biological diversity and the sustainable use of its components. A key feature of the Convention is the establishment of a system of protected areas where special measures need to be taken to conserve biological diversity.

This Plan is consistent with Australia's obligations toward the conservation of migratory species listed on the Appendices of the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention). Parties to this Convention have agreed to protect migratory species, and negotiate and implement agreements for the conservation and management of migratory species including co-operation and support of research relating to migratory species. Australia has also negotiated bilateral migratory bird agreements with the Governments of Japan and China (JAMBA and CAMBA respectively). The Reserves help protect migratory species listed in or under the Bonn Convention, JAMBA and CAMBA by providing refuge areas where breeding, foraging and migration regularly occur.

This Plan is consistent with Australia's obligations under the *United Nations Convention on the Law of the Sea* 1982 (UNCLOS), which came into force in November 1994. UNCLOS provides a framework to

regulate all aspects of the uses of the sea, including conservation of the marine environment.

Consideration may be given during the life of this Plan to nominating either or both of the Reserves for listing as a Wetland of International Importance under the *Convention on Wetlands of International Importance* (Ramsar, Iran, 1971), commonly referred to as the Ramsar Convention. The Ramsar Convention aims to maintain the ecological character of listed wetlands through conservation including, where appropriate, wise use².

Wetlands are designated as Ramsar sites on the basis of their ecological, botanical, zoological, limnological or hydrological values. The Reserves protect significant coral reefs, which are an under-represented wetland type on the Ramsar List of Wetlands of International Importance³.

If the Reserves are designated as Ramsar sites, a Ramsar Information Sheet will be prepared which will describe the site, criteria for inclusion in the Ramsar List, wetland types present, hydrological, ecological, and socio-economic issues, and conservation measures taken and needed to conserve the ecological character of the site. The Ramsar Information Sheet will be made available through the Environment Australia and Ramsar Convention web sites.

2.3 Legislative context

Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve are Commonwealth reserves managed under the EPBC Act. Administration, management and control of Commonwealth reserves are the function of the Director of National Parks. The Director's functions and powers in relation to the Reserves and other

² Wise use is defined under the Ramsar Convention as the sustainable use of wetlands for the benefit of humankind in a way that is compatible with the maintenance of the natural properties of the ecosystem.

³ Under the Ramsar Convention, wetlands are areas where water is the primary factor controlling the environment and associated plant and animal life. As a result of the broad definition of wetlands, the Ramsar Convention extends to a wide variety of habitat types, including rivers and lakes, coastal lagoons, mangroves, peatlands and coral reefs.

Commonwealth marine reserves have been delegated to the First Assistant Secretary of the Marine and Water Division of Environment Australia.

The EPBC Act requires the Director to prepare management plans for Commonwealth reserves. Once prepared, the plans are provided to the Minister for the Environment and Heritage for approval. A management plan is a “disallowable instrument”, and when approved by the Minister must be tabled in each House of the Commonwealth Parliament. Unless disallowed by either the House of Representatives or the Senate within 15 sitting days, the plan will then come into operation. A management plan for a Commonwealth reserve has effect for seven years, unless revoked or amended earlier by another management plan for the reserve.

The EPBC Act requires the Director to exercise the Director’s powers and perform the Director’s functions to give effect to the management plan for a Commonwealth reserve. The Commonwealth and other Commonwealth agencies must not perform functions or exercise powers inconsistently with the management plan (section 362).

A management plan for a Commonwealth reserve must provide for the protection and conservation of the reserve (section 367). Certain matters must be taken into account in preparing a plan (section 368(3)). So far as relevant to the Reserves, those matters are:

- the regulation of the use of the reserve for the purpose for which it was proclaimed (in the case of the Reserves, 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)
- the protection of the special features of the reserve, including objects and sites of biological, historical, palaeontological, archaeological, geological and geographical interest
- the protection, conservation and management of biological diversity and heritage within the reserve
- the protection of the reserve against damage

- Australia's obligations under agreements between Australia and one or more other countries relevant to the protection and conservation of biological diversity and heritage.

The EPBC Act prohibits certain acts from being done in a Commonwealth reserve except in accordance with a management plan (section 354(1)). These acts are:

- kill, injure, take, trade, keep or move a member of a native species
- damage heritage
- carry on an excavation
- erect a building or other structure
- carry out works
- take an action for commercial purposes.

Mining operations are also prohibited unless the Governor-General has approved them and they are carried on in accordance with a management plan (section 355).

Actions that would, or are likely to, have a significant impact on a specified matter of “national environmental significance” are subject to the assessment and approval provisions of the EPBC Act (Chapters 2 and 4). The matters of national environmental significance are:

- World Heritage properties
- wetlands of international importance (Ramsar wetlands)
- listed threatened species and ecological communities
- listed migratory species
- nuclear actions
- the marine environment
- such further actions as are prescribed by the EPBC Regulations under the EPBC Act.

The Reserves are “Commonwealth marine areas” for the purposes of the EPBC Act. The taking of an action in a Commonwealth marine area (including the airspace above it) that will or is likely to have a significant impact on the environment, or the taking of an action outside a Commonwealth marine area that will or is likely to have a

significant impact on the environment in a Commonwealth marine area, will be subject to the assessment and approvals provisions of the EPBC Act.

Responsibility for compliance with the assessment and approvals provisions of the EPBC Act lies with persons taking relevant “controlled” actions. A person proposing to take an action that the person thinks may be or is a controlled action must refer the proposal to the Minister for the Environment and Heritage for the Minister’s decision whether or not the action is a controlled action.

The EPBC Act also contains provisions that prohibit and regulate actions in relation to threatened species and ecological communities, migratory species, cetaceans (whales and dolphins) and other (listed) marine species (Part 13). A number of species that are known to occur in the Reserves are listed threatened species and listed migratory species under the Act. Cetaceans and other marine species listed under the Act are also known to occur in the Reserves (see Attachment 4).

A list of some legislation relevant to the Reserves is in Attachment 5.

2.4 IUCN protected area management category of the Reserves

The EPBC Act requires that a management plan for a Commonwealth reserve must assign the reserve to one of the following IUCN protected area categories:

- strict nature reserve
- wilderness area
- national park
- natural monument
- habitat/species management area
- protected landscape/seascape
- managed resource protected area.

Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve are assigned by this Plan to IUCN category Ia – strict nature

reserve. The characteristics of a strict nature reserve are “the Commonwealth reserve or zone contains some outstanding or representative ecosystems, geological or physiological features or species.”

The EPBC Act provides that a management plan for a Commonwealth reserve may divide the reserve into zones and assign each zone to an IUCN category, which may differ from the category to which the reserve is assigned.

Cartier Island Marine Reserve is not divided into zones.

Ashmore Reef National Nature Reserve is divided into two zones. The majority of the Reserve is zoned IUCN category Ia – strict nature reserve. This area of the Reserve was closed to the public under an Instrument of Prohibition made on 3 September 1997 under the National Parks and Wildlife Regulations (See Attachment 6 for the Instrument of Prohibition and a map of the closed area). This instrument is continued in force under the EPBC Regulations. The remainder of the Reserve, comprising West Island Lagoon and part of West Island, is zoned IUCN category II – national park. The characteristics of a national park are “the Commonwealth reserve consists of an area of land, sea or both in natural condition”.

The EPBC Act requires that the provisions of a management plan for a Commonwealth reserve must not be inconsistent with the relevant “Australian IUCN reserve management principles” for the IUCN category to which the reserve or any zone is assigned by the plan. Australian reserve management principles for all IUCN categories are set out in the EPBC Regulations (Schedule 8). The principles applying to IUCN categories Ia and II are reproduced at Attachment 7.

2.5 Management of the Reserves

The functions and powers of the Director of National Parks in relation to the Reserves and other Commonwealth marine reserves have been delegated to the First Assistant Secretary of the Marine and Water Division of Environment Australia.

Management of the Reserves will include cooperative arrangements with other government agencies including Coastwatch, the Australian Customs Service, Defence, the Australian Fisheries Management Authority, Fisheries WA, the Department of Immigration and Multicultural Affairs and the Australian Quarantine and Inspection Service. Such collaboration supports a whole of government approach to regional management and facilitates effective and cooperative management arrangements of the Reserves.

Cartier Island, and the surrounding area within a ten kilometre radius, is a gazetted Defence Practice Area. The Department of Defence agreed to transfer the responsibility for Cartier Island and surrounding marine areas to Environment Australia subject to access restrictions to ensure public safety. The area of the Reserve as defined in the Reserve proclamation (Attachment 3) is the area within a four nautical mile radius from the island (approximately 7.4 kilometres). The Department of Defence has advised that this is sufficient for public safety purposes.



3. Strategic Objectives

The strategic objectives for Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve comply with the EPBC Act, the *Strategic Plan of Action for the National Representative System of Marine Protected Areas: A Guide for Action by Australian Governments* (ANZECC, 1999), the *Guidelines for Protected Areas Management* (IUCN 1994) and the relevant Australian IUCN Reserve Management Principles (Attachment 7). The strategic objectives and the IUCN reserve management principles form the basis for this management plan.

The strategic objectives for Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve are to:

- protect the high conservation values in the marine and terrestrial environments of Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve
- manage the Reserves as part of the National Representative System of Marine Protected Areas
- contribute to the protection of the overall conservation values in the Oceanic Shoals Bioregion
- facilitate research on the ecology of the Reserves and the Oceanic Shoals Bioregion
- provide biological refuges that will contribute to an integrated management framework for the sustainable use and long term protection of marine resources in the MOU Box.



4. Description of Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve

4.1 Location

Ashmore Reef National Nature Reserve is situated at 12°20'S, 123°0'E and lies some 450 nautical miles west of Darwin, 330 nautical miles north of Broome and 60 nautical miles south of the Indonesian island of Roti. Ashmore Reef National Nature Reserve encloses an area of approximately 583 square kilometres.

Cartier Island Marine Reserve lies approximately 25 nautical miles to the south-east of Ashmore Reef National Nature Reserve at 12°32'S, 123°33'E. Cartier Island Marine Reserve covers 167 square kilometres.

Both reserves include the seabed and substrata to a depth of 1000 metres. The locations of the Reserves are shown in Figures 1 and 2. The boundaries of the Reserves are shown in Figures 3 and 4, and are defined in the proclamation of each Reserve (Attachment 2 and Attachment 3).

4.2 Physical features and processes

Geomorphology

Ashmore Reef National Nature Reserve contains two extensive lagoons, several channelled carbonate sand flats, shifting sand cays, an extensive reef flat, and three vegetated islands – East, Middle and West Islands. Cartier Island Marine Reserve contains one unvegetated sand cay and mature reef flat with two shallow pools immediately to the north east of the cay.

The reef fronts of the Reserves are punctuated with spur and groove formations and have a high diversity of robust corals. The reef crests are algal dominated with the reef flats striated with lines of coral

rubble. The sand flats are extensive and mobile, comprising carbonate sands. The two lagoons at Ashmore have a total of four northern entrances, both have luxuriant coral growth and all three islands at Ashmore have beach rock. At Cartier the unvegetated sand cay has an incomplete protective skirt of beach rock that assists in stabilising its position.

Naturally occurring hydrocarbon seeps have been identified throughout this major hydrocarbon province. The Australian Geological Survey Organisation (AGSO) is currently investigating the relationships between the seeps and benthic community structure. It is thought that the seeps add significantly to the nutrient content and consequently the biota of the region's waters (Glenn and O'Brien 1999).

Oceanography

The regional oceanic processes of Australia's North West Shelf are influenced by several major factors including monsoons, dominant south-easterly winds, seasonal influences from the Indian Ocean, and the Indonesian Through Flow.

The Indonesian Through Flow carries warm low-saline water from the western Pacific Ocean into cooler, high nutrient, highly saline up-welling water of the Indian Ocean. The southward flowing Leeuwin Current originates in the region and flows southward down the Western Australian coastline. This is the only example of a west-coast southern-flowing boundary current in the world. The interactions between these currents and the reefs of the Indo-Pacific play a significant role in the maintenance of coral reef and algal communities further to the south (Hatcher 1991).

Sea surface temperatures vary seasonally with the highest oceanic water temperature recorded at 31 degrees Celsius. Lagoon water has been recorded up to 35.4 degrees Celsius (Glenn in prep).

Tidal ranges for the Reserves exhibit a mean spring tide maximum of 4.75 metres (Flinders Institute for Atmospheric and Marine Sciences 1997).

Climate

The Reserves are in the tropics. The climate is dry (arid tropical), and annual evaporation is twice that of the annual average precipitation. Most rainfall is restricted to the relatively short summer monsoon period. Prolonged periods of rainfall are rare, and yearly rainfall is 950 mm. Monsoonal conditions dominate from December to May with thunderstorms on average 85 days per year (Lavering 1993). Cyclones are common on the North West Shelf with the region experiencing seven per cent of the annual global cyclone total (Pielke 1990). Cyclones typically move south-west across the Arafura and Timor Seas down the Western Australian coastline and can result in large-scale sediment redistribution in the region.

Westerly to north-westerly rain-bearing winds blow from about November to March, and dry south-easterly to easterly trade winds prevail from about May to September. Transitional winds occur in the periods between the monsoon and trade winds and are light and unsteady from either the south-east or north-west. Squall conditions increase in frequency towards the end of transition to the monsoon. March, October, November and December are the calmest months (Australian National Parks and Wildlife Service 1989).

4.3 Ecological values of the Reserves

Biological diversity

The geographical location, seasonal oceanographic conditions, naturally occurring hydrocarbon inputs, and diverse benthic habitat in the Ashmore region support distinct assemblages of benthic and pelagic communities. Ashmore and Cartier reefs are located in a transition area between mainly algal dominated growth to the north and coral dominated growth to the south (Glenn and Opdyke 1997).

The marine environments of the North West Shelf, and specifically the Ashmore region, are notable for overall high biological diversity. Ashmore Reef National Nature Reserve supports the greatest number of reef building coral species of any reef area on the Western Australian coast (Veron 1993). There are also particularly high numbers of mollusc and fish species in the Reserves, and the region

has particular global significance in terms of its sea snake diversity and density.

The reefs of the Reserves exhibit a high level of inter-dependency with adjacent eco-systems to the north and south (Simpson 1991). The Indonesian Through Flow current transports genetic material southwards from the biologically diverse reef systems of the Philippines and Indonesia. As initial recipients in Australian waters of this transported material, the North West Shelf reefs and shoals play a primary role in the maintenance of biodiversity in reef systems further to the south.

Marine habitats

There are a variety of marine habitats in the Reserves. Major marine habitats include reef front and crest, reef flat, sand flats, and lagoons.

The reef front and crest is comprised of hard and soft corals, gorgonians, sponges and a range of encrusting organisms. It provides habitat also for a number of fish, crustaceans and echinoderms. The reef flats have areas of sea grass, which provide critical habitat for a number of species including dugong and turtles. The sand flat habitats support species including feeding turtles, stingrays, echinoderms, molluscs including clams, and crustaceans. The sand flats are important for feeding migratory waders and shore birds. Areas of the sandflats that do not dry at low tide also have a sparse cover of soft corals and various algae. The lagoon habitat supports a wide range of fish, and predators such as sharks and sea snakes. It is also a feeding area for dugong and turtles. The lagoons also support corals, sponges and a range of holothurians, echinoderms and polychaetes on and beneath the substrate.

Marine vertebrates

The Reserves provide critical habitat for an unusually high diversity and density of sea snakes (Hanley and Russell 1993) making them internationally significant. At Ashmore Reef National Nature Reserve there are estimated to be 40,000 sea snakes from at least 13 species, representing the greatest number of sea snake species recorded for any locality in the world (Guinea 1993, Guinea and Pike 1994).

Sea snakes of the subfamily Aipysurini are prominent, three species of which are endemic to Australia's North West Shelf. Some of these sea snakes, for example the Turtle Headed Sea Snake, appear to have extremely limited ranges and diets, depending entirely on very small areas of reef (Guinea, Northern Territory University, pers. comm.). Interestingly there are morphological differences between some of the same species of sea snakes from Cartier Island and those from Ashmore (Guinea, Northern Territory University, pers. comm.).

The Reserves protect critical habitats for feeding and breeding sea turtles, and support large and significant populations of turtles. The nationally vulnerable Green Turtles *Chelonia myda*, Hawksbill Turtles *Eretmochelys imbricata* and the nationally endangered Loggerhead Turtles *Caretta caretta* are found in the Reserves (Guinea 1995). Preliminary surveys estimate that approximately 11,000 sea turtles feed throughout the year at Ashmore (Guinea, Northern Territory University, pers. comm.).

Feeding turtles are present on the reef throughout the year. Each individual may spend several decades feeding in the Reserves, before migrating up to 2,000 kilometres to other reefs for nesting. Adult turtles that have been feeding elsewhere as juveniles return to the Reserves for breeding and nesting. Undisturbed reef flats and sandy beaches are critical to support these populations and help to ensure their reproductive success (Environment Australia 2000).

Ashmore Reef National Nature Reserve supports a small population of *Dugong dugon*. Their range possibly extends to Cartier Island and other submerged shoals in the region (Whiting 1999). Preliminary DNA studies indicate that this population may be genetically distinct from any other Australian population (Whiting 1999). The extent to which this population interacts with populations from the Australian coast or Indonesian coasts is not known. The seagrass beds of Ashmore and Cartier reefs are critical habitat for this population (Whiting 1999).

A survey by the Museum of Western Australia in 1997 brought the total number of recorded fish species for Ashmore Reef to 709 species, which indicates that Ashmore has the most diverse marine fish fauna of any region in Western Australia (Hutchins 1997).

Marine invertebrates

The Reserves support a high diversity of reef building corals, the highest off the coast of Western Australia (Veron 1993). Ashmore Reef National Nature Reserve has 255 species of reef-building corals in 56 genera (Veron 1993). Non-reef-building corals also occur in large numbers. These include alcyonaceans, antipatharians and gorgonians. Other common species, especially on the reef flats, are Blue Coral *Heliopora coerulea* and Organ-Pipe Coral *Tubipora musica* (Marsh 1993). There are also 136 species of sponges (Russell and Hanley 1993).

A range of molluscs are present in the Reserves, including octopus, cuttlefish, squid, chitons and bivalves such as giant clams. Ashmore and Cartier reefs support at least 433 mollusc species (Wells 1993). There are relatively few species of chitons and cephalopods (Wells 1993). The gastropod *Amoria spenceriana* is endemic to Ashmore and adds significantly to the reef's conservation value (Willan 1995). Importantly, the molluscan fauna found at Ashmore differ considerably from that of the Western Australian coast (Wells 1993). Some mollusc species in the region, particularly trochus (*Trochus niloticus*), have declined in numbers and may become regionally extinct without restrictions on harvesting (Skewes *et al.* 1999).

Crustaceans in the Reserves include crayfish, prawns, crabs and hermit crabs. Some 286 species of crustaceans have been recorded (Russell and Hanley 1993). These include 99 species of decapod crustaceans, 40 per cent of which are xanthoids (crabs) and 25 per cent pagoroids (hermit crabs) (Morgan and Berry 1993).

The Reserves have a rich echinoderm fauna, with a total of 192 echinoderm species reported at Ashmore in 1989, covering all classes of the phylum (Vail and Hoggett 1989). This includes 39 species of crinoids (feather stars); 27 species of asteroids (starfishes); 45 species of ophiuroids (brittle and basket stars); and 25 species of echinoids (sea-urchins, heart-urchins and sand dollars). Holothurians (trepan or sea-cucumbers) are particularly diverse and abundant, with 45 species recorded (Marsh *et al.* 1993). This abundance is probably because of extensive suitable sandy habitats at Ashmore.

Terrestrial habitats and flora

Terrestrial habitats in the Reserves consist of vegetated islands and unvegetated sand cays. There are numerous sand cays in the Reserves, including the unvegetated Cartier Island. West, Middle and East Islands in Ashmore Reserve support vegetation. These islands provide critical nesting habitat for many species, including marine turtles and a number of sea and migratory birds.

A limited range of plant species have been recorded at the Ashmore islands. Evidence suggests an on-going dynamism in terrestrial species. New species are introduced by human activities and ocean currents, and the loss of species may be the result of natural events such as cyclones, long dry seasons and beach erosion. (Pike and Leach 1997).

Terrestrial fauna

The Reserves support a high population of seabirds, many of which are migratory and typically have their breeding sites on small isolated islands. The Ashmore islands are regarded as supporting some of the most important seabird rookeries on the North West Shelf. Large colonies of Sooty Terns, Crested Terns, Bridled Terns and Common Noddies breed on East and Middle Islands. Smaller breeding colonies of Little Egrets, Eastern Reef Egrets, Black Noddies and possibly Lesser Noddies also occur on the islands (Australian National Parks and Wildlife Service 1989). Many of the bird species present in the region are listed under JAMBA and CAMBA.

The Reserves are also an important staging point for many migratory wading birds. During October to November and March to April large flocks of Eastern Curlews, Ruddy Turnstones, Whimbrels, Bar-Tailed Godwits, Common Sandpipers, Mongolian Plovers, Red-Necked Stints and Tattlers occur as part of the migration between Australia and the Northern Hemisphere (Australian National Parks and Wildlife Service 1989).

Terrestrial invertebrates recorded at the Ashmore islands include hermit crabs, 127 species of insects, 7 species of spider and a single species each of centipede, pseudoscorpion and millipede (Brown 1999). A species of possible concern is the Ginger ant *Solenopsis geminata*,

an aggressive species native to North America which has spread through much of the tropics and could potentially attack young and adult birds. The Asian House Gecko *Hemidactylus frenatus*, rare on the islands in 1995, is now common at Ashmore (Brown pers. comm.).

4.4 Cultural values

History

Indonesian fishers have been active in utilising the marine resources along the northern coast of Australia for approximately three centuries (Campbell and Wilson 1993, Stacey 1999, Stacey 2000). Ashmore has been regularly visited and fished by Indonesians since the early eighteenth century (Fox 1996, Fox 1988, Stacey 1999). Early travellers to Ashmore included the Bajo, migratory sea peoples originating from the coastline of Sulawesi and islands south of Sulawesi, and fishers from the island of Roti (Fox 1998).

Indonesian fishers were voyaging south seeking new sources of trepang (holothurians or sea cucumbers) which were in demand as a delicacy (Fox 1998). Turtle shell, trochus shell, shark fin and reef fish were other valuable commodities sought by these fishers in waters south of the Indonesian archipelago (MacKnight 1976, Stacey 2000).

One tale of the discovery of Ashmore by the Rotinese is that a vessel sailing from Roti to Timor was forced to run ahead of a storm for five days. The vessel was in open sea and the crew saw some birds and followed them, expecting to find land where they could seek help. They arrived instead at Ashmore, where they remained for some time fishing. They then steered north and returned to Roti (Dwyer 2000).

Rotinese sailors continued to visit Ashmore in their wooden perahu (traditional sailed fishing boats), often using no navigational equipment. The traditional method was to sail due south in alignment with the most prominent hillpoint on the south coast of Roti. If they hadn't reached Ashmore within a full day of leaving Roti, they would return and realign and sail south again (Fox 1988).

Traditional fishers replenished water from the fresh water wells on the islands of Ashmore and , collected fish, birds, bird eggs,

holothurians, clam flesh, shells, turtles and turtle eggs for food and commerce (Campbell and Wilson 1993). Firewood was collected to supplement wood carried with them. They also used Ashmore as a staging point for voyaging to other reefs in the region and further south (Fox 1988).

Ashmore and Cartier were discovered by Europeans early in the nineteenth century. Captain Nash aboard the *Hibernia* discovered Cartier Island and Captain Samuel Ashmore discovered Ashmore (Russell and Vail 1988). Dutch or Portuguese sailors may have already known of their existence. Disputes between the United States of America and Great Britain between 1878 and 1909 over ownership of Ashmore resulted in confirmation of British sovereignty and the annexure of Cartier Island (Pike and Leach 1997). In 1932 Britain handed Ashmore and Cartier Island over to the Australian Government.

The discovery of phosphate deposits (guano) in the area attracted the attention of American whalers operating in the region in the 1840s. Extraction of the deposits was underway by the mid-nineteenth century. By 1891 all guano was reported to have been removed from Ashmore's West Island. The amount of material and the consequences of this activity are largely unknown. However, there is evidence that prior to mining, West Island was the only Ashmore island with significant numbers of nesting sea birds and was therefore the only one with sufficient quantities of guano for mining. It would appear that most populations of nesting birds were driven off West Island by the mining activity and by introduction of rats, and that the birds established instead on Middle and East Islands (Clark, Museum and Art Gallery of the Northern Territory, pers. comm.). Rats were eradicated from West Island during the 1980s.

Cartier Island and the surrounding area within a ten kilometre radius is a gazetted Defence Practice Area for the purposes of military exercises, and has been used as an air weapons range. The Department of Defence renewed the gazettal of this area for military purposes in 1994. Original use of the area for this purpose appears to date back to World War II. The Department of Defence has advised that Cartier Island has not been used as an active air weapons range for over a decade.

A clearance of Cartier Island was conducted in 1986 to remove obvious unexploded military materials. Due to highly mobile sand deposits and the difficulty of clearing the reef, Cartier Island and reef cannot be guaranteed free of unexploded military materials, which may be easily exposed through natural wind and wave activity or turtle nesting in the area. This risk of unexploded bombs poses a safety hazard to visitors to the reef and island.

The Department of Defence has indicated that degazettal of the Defence Practice Area is dependent upon Environment Australia developing a program to restrict access to Cartier Island and reef for safety reasons. The Department of Defence indicated that it would be possible to develop guidelines for use of the area for research and management.

Indonesian artefacts

Indonesian artefacts in the Reserves include ceramics, graves, ballast rocks and what could be a trepang cooking site (Clark 2000). Graves are found on West, Middle and East Islands. Seven graves were recorded on West Island and one on Middle Island in 1996 (Clark 2000). Additionally, at least one Indonesian fisher was buried on Cartier Island during 2000. The cultural artefacts are deteriorating through natural processes.

European wrecks

The *Ann Millicent*, an iron hulled barque of 944 tons, was wrecked on Cartier Island on 5 January 1888. It was on a voyage from the Gulf of Carpentaria to Adelaide when it struck the southern edge of the reef around Cartier Island and was grounded. A wreck believed to be that of the *Ann Millicent* is visible at low tide on the southern reef edge of Cartier Island.

During the Second World War a RAAF Beaufighter sustained damage during a conflict and landed on Cartier Island. Following the rescue of the crew, the wreck was strafed by other aircraft and set alight. Some remains of the aircraft are still found on Cartier Island.



5. Reserve Uses and Pressures

A range of uses have been made of the Reserves and the surrounding area. Coral reef communities are also subject to disturbance from a range of recurrent natural events, including storms, cyclones, toxic blooms, and El Niño events. As a result of these recurrent disturbances, coral reef communities are dynamic. Given the dynamic nature of the reef and potential for disturbance it is important to ensure the protection of a range of reefs to ensure a representative sample of the variety of habitats in the region will be conserved over time.

This Plan focuses on existing and potential pressures caused by human activities that can be influenced by management actions. Table 1 summarises the existing and potential pressures on the conservation values of the Reserves, and links them to human activities in and around the reserve.

5.1 Traditional fishing

Traditional fishers have an historic and ongoing association with islands and reefs in the region.

Recognition of traditional fishing is incorporated into an MOU signed between Australia and Indonesia in 1974 and reviewed in 1989 (see chapter 2.2 of this Plan and Attachment 1). Under the provisions of the MOU, traditional fishers are permitted to take fish and certain sedentary species within the MOU Box area.

Fishers who have continued to access Ashmore in recent years (since the signing of the MOU) are from a number of islands and ethnic groups. The majority appear to come from Roti, which is the closest island to Ashmore (Russell and Vail 1988). Other major ethnic groups of fishers to visit Ashmore are the Bajo (Fox 1998, Stacey 1999, Stacey 2000) and the Butonese (Fox 1998).

Traditional fishers target a range of species in the MOU Box. Generally they target species and products considered highly

valuable in the Asian market. Species targeted include trochus, trepang and sharks for their fins (Russell and Vail 1988). Fish is taken mostly for immediate consumption or taken home for the fishers' families (Russell and Vail 1988).

Unsustainable and illegal fishing practices are currently recognised as the most significant direct and indirect threat to natural processes and biological diversity in the Ashmore region and particularly to the Reserves.

Studies of target species in the MOU Box and surrounding areas by (Skewes *et al.* 1999) have indicated that:

- trepang species with high commercial value have been heavily over-exploited, and all species of trepang are found in very low densities, except for Ashmore Reef National Nature Reserve where trepang are present but evidence of depletion is clear
- trochus stocks have been virtually exhausted on most reefs, except in Ashmore Reef National Nature Reserve where trochus are present but evidence of depletion is clear
- low abundances and small sizes of sharks on the shallow reef-edges and shoals suggest that current fishing efforts may be seriously depleting the shark population.

Russell and Vail (1988) also concluded that there had been high levels of exploitation of trepang, clam and trochus at Ashmore.

Despite low abundances of target species in the MOU Box and reduced catch rates over the last few years (Skewes *et al.* 1999), harvesting pressure on these commercial species is expected to continue due to ongoing demand for these products and potential for increasing levels of technology of fishing gear. Over the past two decades, fishing pressures in the region appear to have increased (Russell and Vail 1988).

Fishers have also been known to harvest sea turtles, seabirds, seabird eggs, dolphins, and giant clams (Russell and Vail 1988). A number of these species are protected under international agreements and Australian legislation. The taking of species protected under the Convention on International Trade in Endangered Species of Wild

Fauna and Flora (CITES), such as giant clams, turtles and dolphins, is not permitted under the MOU.

Fishers are believed to have had an impact on the seabirds of Ashmore in the past via hunting. Evidence for this includes photographic records dating back to 1980, the presence of bird drying racks found in 1983, and conversations with the fishers (EA records). Harvest of birds is not a current problem at Ashmore or Cartier.

Other potential pressures associated with fishing include introduction of marine and terrestrial pests, weeds and pollution from release of sewage, hydrocarbons, and litter.

5.2 Unauthorised boat arrivals

Over the past decade Ashmore has been an occasional destination for vessels transporting unauthorised boat arrivals. During 1999 there was a rapid escalation in this activity with 40 such vessels arriving at Ashmore. This pattern continued during 2000. The sudden and unexpected rise in arrivals has given rise to a range of threats to the natural environments of the Reserves, particularly Ashmore.

Large numbers of these vessels near reefal and lagoon environments have potential to cause considerable damage to ecosystems. Unauthorised vessels are generally crowded and in poor condition, and many of these boats are prone to sinking. Unauthorised boat arrivals have at times accessed West Island. Potential impacts include:

- pollution, including fuel and oil leaks, oil-laden bilge water, and high concentrations of raw human wastes
- significant release of fuel, waste and debris when boats sink in the lagoon
- illegal harvesting of reef resources and protected species due to food shortages on these vessels
- introduction of marine and terrestrial pests and weeds
- terrestrial environmental impacts such as disturbing and killing nesting birds and removing their critical habitat.

5.3 Tourism and recreation

Commercial tour operators have visited the region intermittently, primarily for scuba diving and bird watching because the Reserves provide opportunities for these activities. All visitors to the region currently arrive by boat, mainly on yachts on route to other locations.

Little tourist or recreational activity currently occurs within the Reserves or is anticipated, as visitor numbers are limited by the remote location, and difficulty and expense involved in accessing the area.

Existing and potential pressures are considered minimal, due to low visitor numbers. Potential pressures include damage to habitat and illegal collecting of flora and fauna such as coral and shells, and introduction of pest species. As a Defence Practice Area, safety issues are a restriction to tourism on Cartier Island Marine Reserve.

5.4 Research

The Reserves provide a valuable site for research to increase knowledge of tropical marine ecosystems.

Ashmore Reef National Nature Reserve has been a focus for research over a number of years by agencies including the Museums of the Northern Territory and Western Australia, the Commonwealth Scientific and Industrial Research Organisation (CSIRO), and the Australian Institute of Marine Sciences (AIMS). Cartier Island has been the subject of more limited research. Research relevant to the Reserves has included projects on sea snakes, sea birds, fish, corals, molluscs, cephalopods and other invertebrates, and a survey and analysis of the biological and cultural values of Cartier Island (Hanley and Russell 1993). Current study topics include regional biodiversity, water chemistry, terrestrial plant ecology, sea turtle behaviour and sedimentology.

Environment Australia has actively encouraged research which contributes to knowledge and management of the Reserves. Due to the remoteness of the Reserves, research and monitoring can be costly, both in terms of time and resources. The long-term presence of an on site management vessel at Ashmore Reef National Nature Reserve has provided an opportunity for supporting and encouraging

targeted research efforts. The cooperation of the Australian Customs Service, Coastwatch and the Royal Australian Navy in providing access and transport to the Reserves has been extremely valuable in facilitating research and monitoring opportunities.

While research can be invaluable for management and performance assessment, it also has the potential to impact on the Reserves. Potential pressures from research within the Reserves include collection of specimens, damage to habitat and disturbance of wildlife.

5.5 Australian commercial fishing

Two fisheries operate in the region under the *Fisheries Management Act 1991* (Commonwealth). These are the North West Slope Trawl Fishery and the Southern and Western Tuna and Billfish Fishery. The Northern Demersal Interim Scalefish Managed Fishery also operates in the region. The region is not a significant area for these fisheries, and low numbers of commercially valuable species indicate that the region is currently unlikely to support a major Australian commercial fishery.

The Reserves fall into the northern most extremity of the North West Slope Trawl Fishery. The Australian Fisheries Management Authority (AFMA) indicates that the North West Slope Trawl Fishery currently involves little regular trawl fishing and that the value of this area to the fishery is likely to be low. Permit holders in the Southern and Western Tuna and Billfish Fishery primarily use pelagic longlines. There is currently little fishing activity within the region of the Reserves by permit holders in the fishery. The Northern Demersal Scalefish Interim Managed Fishery operates in the area including at Woodbine and Johnson Banks.

Pressures on the values of the reserve from Australian commercial fishing are minimal as there is no significant commercial fishing effort in the region. The potential for development of any major Australian commercial fishery is low.

5.6 Mining operations

Petroleum exploration and exploitation in the North West Shelf region has been ongoing since the 1960s and this area is known as a major hydrocarbon province (Glenn and O'Brien 1999). Significant oil and gas discoveries have been made in the region.

A number of exploration wells have been drilled in the vicinity of the Reserves. There are petroleum exploration permits immediately to the east and south-east of the Reserves. In 2000 the Department of Industry, Science and Resources released exploration leases in the area with the condition that any permits offered for these areas would not allow exploration and development activities within four nautical miles of the centre of Cartier Island to a depth of 1000 metres.

The Ashmore Platform, on which Ashmore, Cartier Island and the nearby Hibernia Reef sit, is not fully explored but is considered to have less hydrocarbon potential than the adjacent Bonaparte Basin due to the underlying geology (AGSO, pers. comm.). However these perceptions of prospectivity may change with new information or reinterpretation of existing data.

With ongoing exploitation of hydrocarbons in the region, there are potential threats to the Reserves associated with increased shipping, pipeline construction, potential oil spills and drilling activities. Potential pressures on the Reserves in relation to petroleum and mineral exploration and extraction within the vicinity include:

- accidental discharge of oil caused by leaks or spills and discharge of liquid and decomposable solid wastes
- localised, high energy, low frequency noise emitted during seismic surveys
- disturbance of bottom sediments by rig and supply vessel anchors, and during rig or pipeline positioning and decommissioning
- disposal of drill cuttings can increase the turbidity and add chemicals to the water
- release of produced formation water may alter the chemical and temperature characteristics of the water.

The majority of these impacts would be localised and short term and would therefore only be relevant if development occurs in close proximity to the Reserves. However, if the level of petroleum or mineral exploration and exploitation activities increase significantly, wider ranging and longer lasting impacts may result. It is acknowledged that the offshore petroleum industry has a good environment record, as was recognised in the 1995 State of the Marine Environment Report (Zann 1995). A detailed analysis of potential environmental impacts of offshore oil and gas activities is provided by Swan *et al.* (1994).

5.7 Shipping

There are no major shipping routes in the vicinity of the Reserves. However, shipping activities can potentially impact on the Reserves. The main potential pressure would be pollution from fuel, oil spills and marine debris.

5.8 Buildings and other structures

A few minor facilities have been installed at Ashmore in the past, including a weather station in 1962 and again in 1971. The weather station was abandoned in 1973. There are currently no buildings or other structures in the Reserves.

Structures requiring regular maintenance can lead to disturbance of bird populations.

5.9 Other commercial activities

There have been occasional visits to the Reserves by commercial film makers and journalists. The focus of these visits have included the study of sea snakes, Royal Australian Navy patrols, and illegal immigration. These activities can potentially result in disturbance to wildlife and habitats.

5.10 Pollution

Maintenance of high water quality at Ashmore and Cartier Island is vital for the continued health of the Reserves' biological diversity. The lagoon is most at risk from pollutants, due to limited water circulation and the regular presence of Indonesian fishing vessels and suspected illegal immigration vessels resulting in excess nutrients being added to the environment. Human waste impacts significantly on both the terrestrial and marine environments, for example excess nutrients can encourage growth of exotic flora and fauna.

Significant potential threats to marine habitat from marine debris, particularly plastics and abandoned fishing nets, may come from human activities near-shore and off-shore. Distant sources of pollution are also an issue due to the long ranging currents and fronts that affect the region. Plastic containers and products sourced from Asia are commonly found in the waters and intertidal zones of the islands.

The ability of these ecosystems to withstand sudden pollution pressures is likely to be poor because of their small size, the dominance of water-filtering and scavenging organisms, their remoteness from sources of recruitment, and the inability of emergency workers to respond to the threats in a timely manner.

Table 1: Potential and existing pressures on major values of the Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve

PRESSURES	VALUES			
	MARINE HABITATS	TERRESTRIAL HABITATS	MARINE AND TERRESTRIAL SPECIES	CULTURAL
TRADITIONAL FISHING	<ul style="list-style-type: none"> – anchor damage – introduction of marine pests – release of pollutants (including sewage, plastics and fishing line) – physical damage and pollution from boats sinking 	<ul style="list-style-type: none"> – introduction of pest species, e.g. rats, insects, weeds – disturbance to habitat by boats wrecked on the islands, trampling, fires, camping, collection of firewood 	<ul style="list-style-type: none"> – illegal harvest of birds, bird eggs, turtle eggs, and marine species – bird disturbance (can result in death of some species particularly breeding sea birds) 	<ul style="list-style-type: none"> – disturbance or collection of artefacts
UNAUTHORISED BOAT ARRIVALS	<ul style="list-style-type: none"> – anchor damage – introduction of marine pests – release of pollutants (including sewage, hydrocarbons, plastics and fishing line) – physical damage and pollution from boats sinking 	<ul style="list-style-type: none"> – introduction of pest species, e.g. rats, insects, weeds – disturbance to habitat by boats wrecked on the islands, trampling, fires, camping, collection of firewood 	<ul style="list-style-type: none"> – illegal harvest of birds, bird eggs, turtle eggs, and marine species in the Reserves – bird disturbance 	<ul style="list-style-type: none"> – disturbance or collection of artefacts
TOURISM AND RECREATION	<ul style="list-style-type: none"> – pollution from boats, including fuel, oil spills and litter – damage to habitat eg. from anchors – introduction of marine pests 	<ul style="list-style-type: none"> – damage to habitat by uncontrolled visitation – introduction of pest species, e.g. rats, insects, weeds 	<ul style="list-style-type: none"> – illegal collecting of flora and fauna, e.g. coral and shells – bird disturbance 	<ul style="list-style-type: none"> – disturbance or collection of artefacts
RESEARCH	<ul style="list-style-type: none"> – damage to habitat, e.g. from anchors 	<ul style="list-style-type: none"> – damage to habitat 	<ul style="list-style-type: none"> – damage to or removal of fauna and flora – bird disturbance 	<ul style="list-style-type: none"> – disturbance or collection of artefacts
AUSTRALIAN COMMERCIAL FISHING	<ul style="list-style-type: none"> – pollution from boats, including fuel, oil spills and litter 		<ul style="list-style-type: none"> – reduction in abundance of fish in Reserves 	
MINING OPERATIONS	<ul style="list-style-type: none"> – pollution from mining operations and associated shipping including fuel, oil spills, and litter 	<ul style="list-style-type: none"> – damage from pollution 	<ul style="list-style-type: none"> – damage from pollution 	<ul style="list-style-type: none"> – loss of wilderness values due to visual impacts of built structures
SHIPPING	<ul style="list-style-type: none"> – pollution from passing ships including fuel, oil spills and litter 	<ul style="list-style-type: none"> – damage from pollution 	<ul style="list-style-type: none"> – damage from pollution 	
BUILDINGS AND OTHER STRUCTURES			<ul style="list-style-type: none"> – bird disturbance due to presence or maintenance 	<ul style="list-style-type: none"> – loss of wilderness values due to visual impacts of built structures



6. Managing Ashmore Reef National Nature Reserve and Cartier Island Marine Reserves

The relatively high numbers of sedentary species at Ashmore Reef National Nature Reserve compared with other reefs in the region where they are targeted by traditional fishers indicates that ongoing closure at Ashmore implemented by Environment Australia has contributed to protection of these stocks (Skewes *et al.* 1999). The continued protection of the marine environment of the Reserves is critical to ensure that a representative sample of the region's natural environments is protected.

The EPBC Act requires that management plans for Commonwealth marine reserves state how the natural features of the reserve will be protected, conserved and managed, and indicate those activities that will be prohibited or regulated in the Reserve and the means of prohibiting or regulating them.

Consistent with the ANZECC best practice model in performance reporting (ANZECC 1997), the management goals and strategies derive from the requirements of the legislation, the strategic objectives for the Reserves (Chapter 3), and an analysis of the potential pressures on the key values of the Reserves (Chapter 5). The ecological and cultural values of the Reserves are described in Chapter 4 and major uses described in Chapters 5.

Cartier Island Marine Reserve and the majority of Ashmore Reef National Nature Reserve is assigned to IUCN category Ia – strict nature reserve. The IUCN category Ia area of Ashmore Reef National Nature Reserve coincides with the area closed by an Instrument of Prohibition issued in 1997 (see Figure 5 and Attachment 6). West Island Lagoon of Ashmore Reef National Nature Reserve and part of West Island are assigned to IUCN category II – national park. The IUCN zoning of the Reserves was discussed in Chapter 2.

Public access and uses will be limited to the extent that is consistent with the reserve management principles applying to the two relevant IUCN categories (Attachment 7). Access arrangements are discussed in 6.1 below. A summary of the activities allowed within the two IUCN categories of the Reserves is in Table 2.

Environment Australia will administer a permit system for relevant activities under the EPBC Regulations. In particular, any commercial activities or scientific research allowed by this Plan will require a permit. Permits will be issued subject to strict conditions to protect the natural and cultural values of the Reserves.

Under the EPBC Act, a person cannot “kill, injure, take, trade, keep or move” a member of a native species, except in accordance with a management plan. All taking of native species in the Reserves is prohibited without a permit under this Plan, except fishing for immediate consumption within West Island Lagoon. The prohibition includes all commercial and recreational harvesting, and all other collection of plants or animals without a permit.

Management guidelines have been developed to assist on-site managers with the day to day management of the Reserves. These guidelines will continue to be developed based on experience and changing circumstances.

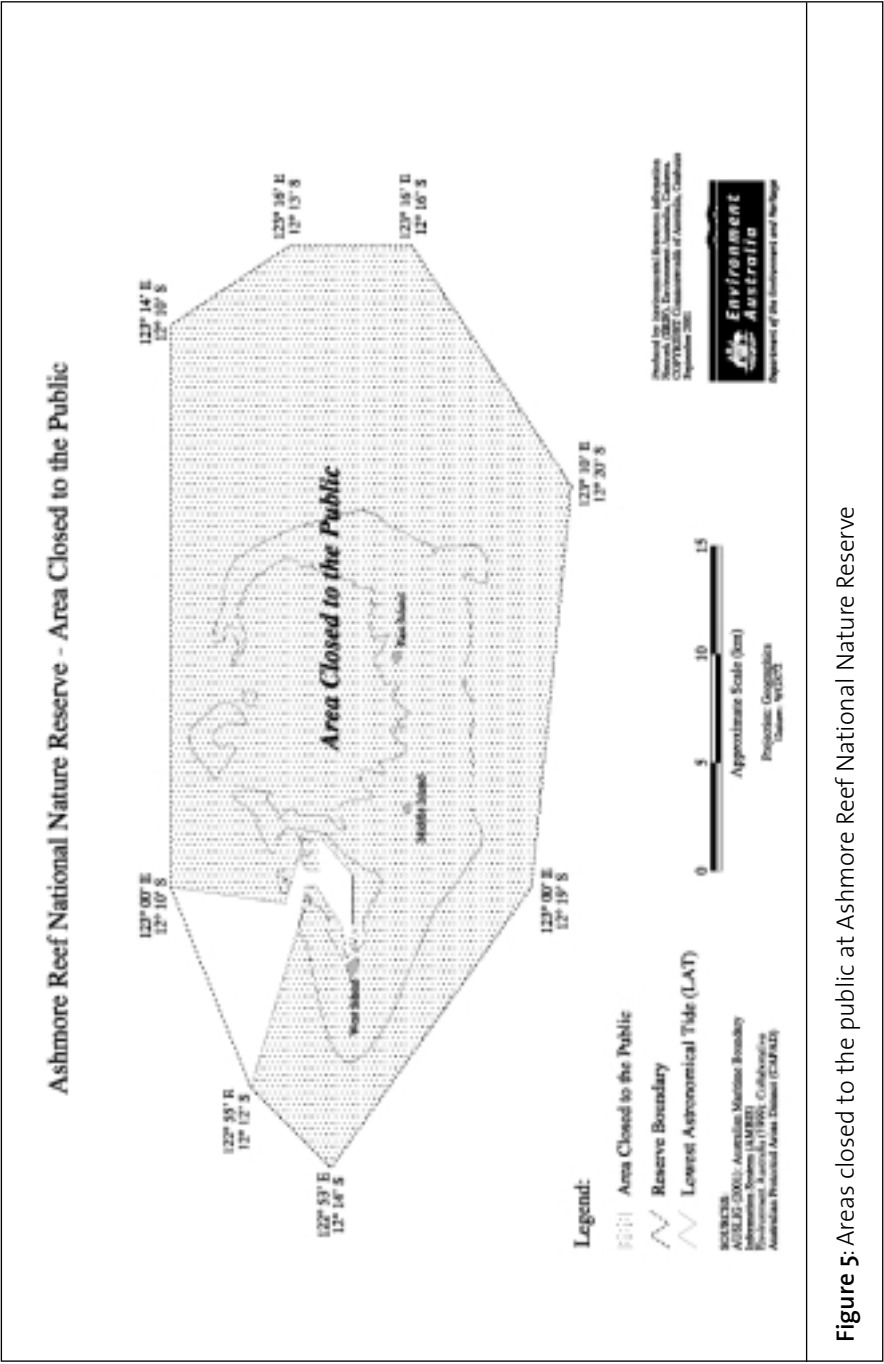


Figure 5: Areas closed to the public at Ashmore Reef National Nature Reserve

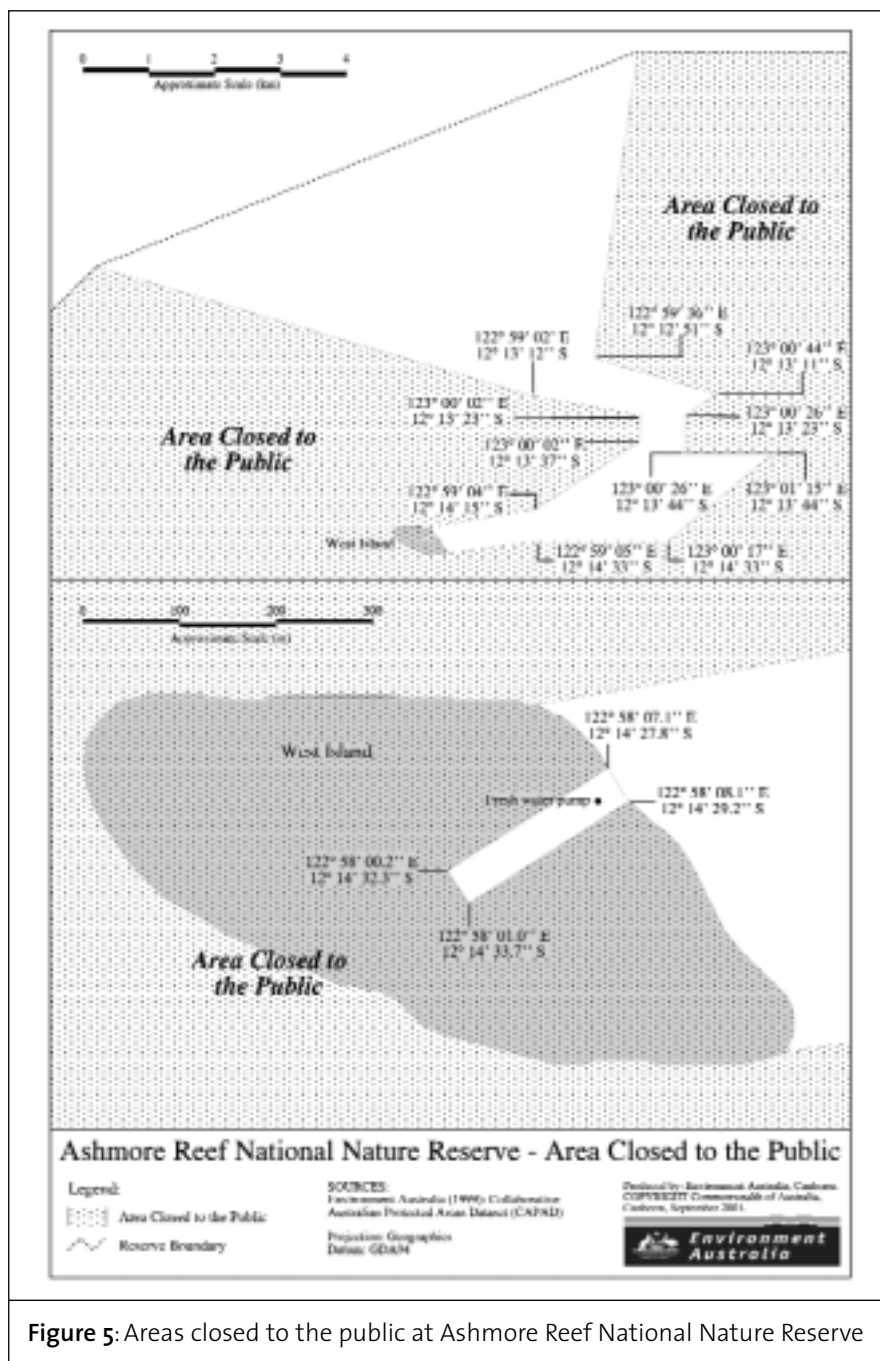


Table 2: Summary of activities regulated in Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve

ACTIVITY	IUCN CATEGORY IA ZONES Cartier Island Marine Reserve and the majority of Ashmore Reef National Nature Reserve	IUCN CATEGORY II ZONE West Island Lagoon and part of West Island in Ashmore Reef National Nature Reserve
ACCESS	– closed to the public	– allowed
TAKE OF NATIVE SPECIES	– all take of native species is prohibited without a permit	– all take of native species is prohibited without a permit except for fishing for immediate consumption
TRADITIONAL FISHING	<ul style="list-style-type: none"> – access permitted to West, Middle and East Islands to visit grave sites. Protocols will be developed for these visits which are sensitive to cultural needs – traditional fishing prohibited 	<ul style="list-style-type: none"> – traditional fishers allowed access for fresh water and shelter from storms. – access permitted to visit grave sites. Protocols which are sensitive to cultural needs will be developed for these visits. – traditional fishing prohibited, except for fishing (finfish only) for immediate consumption and one day's sailing
AUSTRALIAN COMMERCIAL FISHING	– prohibited	– prohibited
RECREATIONAL FISHING	– prohibited	– for immediate consumption only
TOURISM AND RECREATION	<ul style="list-style-type: none"> – commercial tourism is subject to permit, considered on a case-by-case basis – permits will be granted only where the activity will contribute to knowledge or management of the Reserves, will be highly restricted in the extent of its operation, and where it can be demonstrated that there will be no significant impact on the values of the Reserve 	<ul style="list-style-type: none"> – commercial tourism is subject to permit, considered on a case by case basis – non-commercial recreation is allowed and permits are not required
FILMING AND OTHER COMMERCIAL ACTIVITIES	<ul style="list-style-type: none"> – subject to permit – permits will be granted only where the activity will contribute to knowledge or management of the Reserves, will be highly restricted in the extent of its operation and where it can be demonstrated that there will be no significant impact on the values of the Reserve 	– subject to permit, considered on case-by-case basis
MINING OPERATIONS	– prohibited	– prohibited
BUILDINGS AND OTHER STRUCTURES	– prohibited	<ul style="list-style-type: none"> – considered on case-by-case basis – all proposals subject to environmental assessment. – only small scale facilities (such as weather monitoring stations) that are consistent with a category II Reserve will be allowed
RESEARCH	<ul style="list-style-type: none"> – research contributing to management objectives allowed – subject to permit, considered on case-by-case basis – permits will be granted only where the activity will contribute to knowledge or management of the Reserves, and can be demonstrated that there will be no significant impact on the values of the Reserve. 	<ul style="list-style-type: none"> – research contributing to management objectives allowed – subject to permit, considered on case-by-case basis

6.1 Access

General visitor access to most of Ashmore Reef National Nature Reserve has been restricted since 1990 to protect the biodiversity of the Reserve. In 1997 the Director prohibited access to most of the Reserve under regulation 31 of the National Parks and Wildlife Conservation (NPWC) Regulations. Access is allowed to West Island Lagoon and part of West Island only. A map of the affected areas is at Figure 5 and a copy of the prohibition instrument is at Attachment 6.

The Director has the power to prohibit or restrict entry to a Commonwealth reserve under Regulation 12.23 of the EPBC Regulations, which replace the NPWC Regulations. Pursuant to regulation 20.02 of the EPBC Regulations the prohibition made by the Director under regulation 31 of the NPWC Regulations in respect of Ashmore Reef National Nature Reserve is taken to have been made under regulation 12.23 of the EPBC Regulations.

As noted earlier in the Plan, Cartier Island and the surrounding area within a ten kilometre radius is a declared Defence Practice Area and was used in the past as an air weapons range. The area around Cartier Island is identified as a closed area for shipping in shipping notices. The risk of unexploded ordnance poses a safety hazard to visitors to the reef and island. Because of this risk, and to protect the biodiversity of Cartier Island Marine Reserve, visitor access to the Reserve is prohibited.

The management of the Reserves will not impinge on the freedom of navigation contained in UNCLOS. Legal action will not be taken by Australian authorities under the EPBC Act against masters or crew of boats forced to shelter in the IUCN category 1a zones of the Reserves in circumstances where this is necessary for human safety.

EA will work closely with Defence to ensure Defence activities and operations are consistent with conservation objectives and legislation, without adversely impacting upon matters of national security.

Management goals

- Maintain the prohibition on access to most of Ashmore Reef National Nature Reserve and prohibit access to Cartier Island Marine Reserve.

Management strategies

ASHMORE REEF NATIONAL NATURE RESERVE

- The Director will maintain the existing prohibition on visitor access under the EPBC Regulations unless circumstances warrant it being amended or revoked.
- Access to the closed area may be allowed in accordance with a permit issued by the Director under the EPBC Regulations. Applications for permits will be considered on a case-by-case basis. The issue of permits will take into account likely impacts of the proposed activity, relevant Australian IUCN reserve management principles, the strategic objectives of the Reserve, and relevant management goals. Access will also be subject to the strategies prescribed in the following sections of the Plan.

CARTIER ISLAND MARINE RESERVE

- Access to Cartier Island Marine Reserve will be prohibited by the Director under the EPBC Regulations. The Director will maintain this prohibition on visitor access under the EPBC Regulations unless circumstances warrant it being amended or revoked.
- Access may be allowed in accordance with a permit issued by the Director under the EPBC Regulations. Applications for permits will be considered on a case-by-case basis. The issue of permits will take into account the likely impacts of the proposed activity, relevant Australian IUCN reserve management principles, the strategic objectives of the Reserve, and relevant management goals and safety issues. Access will also be subject to the strategies prescribed in the following sections of the Plan.
- Safety procedures will be developed in consultation with the Department of Defence, including directions for undertaking management and research activities in an area previously used as a Defence Practice Area.

6.2 Cultural values

The establishment of the Reserves protects and conserves the cultural values of the area. These include Indonesian and European cultural values as described in Chapter 4.

The wreck of the *Ann Millicent* was listed in the Commonwealth of Australia Gazette of 12 March 1982 as being of historic significance, and is protected under section 5(1) of the *Historic Shipwrecks Act 1976* (Commonwealth). Under this Act it is an offence for any person to damage, interfere with, dispose of or remove any part of the historic shipwreck without a permit issued under the Act.

Management goals

- Preserve Indonesian and European cultural items in the Reserves.

Management strategies

- Incorporate information about the Indonesian and European cultural items into public education and interpretive material to be prepared for the Reserves.
- Ensure that cultural items are left *in situ* except in the case of research subject to a permit.
- Ensure organisations providing management and research assistance are aware of the restrictions applying to cultural items.
- Provide access for Indonesian fishers to grave sites where appropriate. Requests for such visits are occasional and the issue of permits would be inappropriate. Protocols which are sensitive to cultural needs will be developed for these visits.

6.3 Traditional fishing

The 1974 MOU between Australia and Indonesia (see sections 2.2 and 5.1 of the Plan and Attachment 1) allows traditional Indonesian fishers to catch fish for immediate consumption in West Island Lagoon of Ashmore Reef National Nature Reserve. Access to the lagoon for shelter and to West Island for drinking water is also permitted. This is reflected in the instrument of prohibition referred to in section 6.1 of the Plan (Attachment 6).

As is common for limited remote water supplies, the water quality and availability at West Island cannot be guaranteed.

Section 354(1)(a) of the EPBC Act provides that a person must not kill, injure, take, trade, keep or move a member of a native species in a Commonwealth reserve except in accordance with a management plan in operation for the reserve. The term “native species” is defined broadly by the EPBC Act. So far as relevant to the Reserves it means in general any species of wildlife (animal or plant) that is indigenous to the Reserve or members of the species that visit the Reserve from time to time.

Traditional fishing has continued to be undertaken at Cartier Reef in accordance with the 1974 MOU. Scientific advice has recommended that the protection of Cartier Reef will support regional biodiversity. As noted in section 6.1 of the Plan access to Cartier Island Marine Reserve is to be prohibited under the EPBC Regulations.

Discussions have been held between Australian and Indonesian authorities in relation to overfishing and illegal fishing in the MOU Box and the Reserves. Through continued cooperation and collaboration it is intended to develop initiatives to recover the fishery within the MOU Box and to reduce illegal fishing activities in the Reserves. It is hoped that a cooperative approach on these matters will in the long term provide alternative livelihoods for traditional fishers and develop a sustainable resource management system within the MOU Box.

Management goals

- Minimise impacts of traditional fishers on the environmental values of the Reserves.
- Work cooperatively with governments and fishers to protect the values of the Reserves.

Management strategies

- No fishing or other taking of native species by traditional fishers is allowed in the Reserves, except for fishing (finfish only) for immediate consumption and one day's sailing in West Island Lagoon of Ashmore Reef National Nature Reserve. This continues prohibitions under the previous Plan of Management for Ashmore Reef National Nature Reserve. Cartier Island Marine Reserve will be closed to traditional fishing under this Plan.
- Access to the Reserves by traditional fishers will be in accordance with the access prohibitions in section 6.1 and section 6.2 of the Plan.
- Work cooperatively with stakeholders regarding management of the Reserves and compliance and enforcement arrangements. Ongoing consultations will be held between Environment Australia and relevant Indonesian agencies.
- Work cooperatively with stakeholders to facilitate the development of a sustainable resource management system in the MOU Box that improves the protection of the Reserves.
- Facilitate studies and research which provides a more thorough understanding and appreciation of the history, trends, dependencies and views of fishers on the marine resources of the MOU Box and Reserves.
- Develop and support cooperative projects with Indonesia that facilitate alternative livelihoods for traditional fishers.
- Prepare and distribute, in consultation with stakeholders, educational material in Indonesian to inform traditional fishers of the purposes of the Reserves, the reasons and details of restrictions, and to raise awareness of conservation values of the Reserves and ways to minimise damage to the natural features of the Reserves.
- Inform traditional fishers of the closure of Cartier Island Marine Reserve. During the first 12 months following closure an awareness raising approach will be taken for compliance and enforcement of new provisions.

- Develop and implement a marine and terrestrial introduced species prevention and management strategy (this strategy also applies to section 6.4 and 6.5, and is relevant for all users of the Reserves).
- Develop procedures for minimising release of oil, fuel, bilge water, and sewage into the Reserves and responding to pollution events (this strategy also applies to section 6.4 and 6.5, and is relevant for all users of the Reserves).
- Maintain a management and surveillance presence as part of the Compliance and Enforcement Plan for the Reserves.

6.4 Unauthorised boat arrivals

It is likely that Ashmore will continue to be a focus for unauthorised boat arrivals during the period of operation of this Plan. Primary management issues associated with unauthorised boat arrivals include accommodation prior to relocation and storage and removal of unauthorised vessels. Management practices should minimise the environmental impacts of these activities.

The Department of Immigration and Multicultural Affairs (DIMA) has primary responsibility for managing unauthorised boat arrivals. DIMA requests agencies such as the Australian Customs Service (including the Coastwatch Division), and the Department of Defence to undertake tasks associated with managing unauthorised boat arrivals.

Environment Australia is a member of the Coastwatch Operations and Program Advisory Committee and Program Advisory Subcommittee. Through these forums, Environment Australia has been able to advise on regulations and practices to minimise the environmental impacts associated with management of unauthorised boat arrivals and unauthorised vessels at Ashmore and Cartier.

It is anticipated that activities in relation to the management of unauthorised boat arrivals and unauthorised vessels may have to be carried out in the Reserves from time to time by government agencies.

Management goals

- Minimise impacts of unauthorised boat arrivals and unauthorised vessels on the environmental and cultural values of the Reserves.

Management strategies

- Activities by government agencies in the Reserves in relation to management of unauthorised boat arrivals and unauthorised vessels will be carried out in consultation with Environment Australia.
- In cooperation with relevant government agencies, develop and implement procedures for minimising the impacts of unauthorised boat arrivals and unauthorised vessels accessing the Reserves.

6.5 Tourism and recreation

Tourism and recreation in the Reserves are mainly limited to West Island Lagoon and part of West Island. Historically there have been few visitors to the Reserves.

The EPBC Act contains provisions that will affect tourism and recreation activities. As noted in section 6.3 of the Plan, section 354(1)(a) of the EPBC Act provides that actions affecting native species can only be taken in the Reserves in accordance with a management plan. Section 354(1)(f) of the EPBC Act provides that a person must not take an action for commercial purposes in a Commonwealth reserve except in accordance with a management plan in operation for the reserve.

The EPBC Regulations also contain provisions that may be relevant to tourism and recreation activities in the Reserves, for example lighting of fires and camping are controlled by the Regulations.

Also, subregulations 12.35(3) and (4) prescribe a number of limitations on the way in which recreational fishing may be carried on (if allowed by a management plan). They provide that a person must not:

- use equipment that allows the person to breathe under the surface of the water; or

- attract or take fish using, or install, equipment other than: a rod and line to which a single hook or fishing lure is attached; or a hand-held line to which a single hook or fishing lure is attached; or a hand-held net designed to land a fish caught on a hook or fishing lure to which a line is attached; or
- use a hand-held net to take a fish that has not been caught on a hook or fishing lure attached to a line.
- use a live animal as bait for fishing; or
- use a member of a native species, other than a species of fish, as bait for fishing; or
- fish by leaving a fishing line unattended; or
- clean or fillet fish within a marine area.

Management goals

- Protect natural and cultural values of the Reserves from adverse impacts of recreational users.
- Allow limited use of areas of the Reserves zoned IUCN category II for passive tourism and recreational activities.
- Allow limited use of the areas of the Reserves zoned IUCN category Ia for passive tourist and recreation activities subject to permit.

Management strategies

- Commercial tours and commercial recreation activities will not be allowed in the Reserves except in accordance with a permit issued by the Director under the EPBC Regulations.
- Applications for permits to carry out commercial tour and recreation activities in the Reserves will be considered on a case-by-case basis. The issue of permits will take into account likely impact of the proposed activity, relevant Australian IUCN reserve management principles, the strategic objectives of the Reserve, and relevant management goals.

- Commercial tourism and recreation will be permitted in the areas of the Reserves zoned IUCN category Ia only where the activity: will contribute to the knowledge and management of the Reserves; is highly restricted in terms of the extent of its operation in the Reserves; and it can be clearly demonstrated that there will be no significant impact on the values of the Reserve.
- Recreational fishing, including charter fishing, game fishing and 'catch and release' fishing is prohibited in the Reserves, except that fishing for immediate consumption may be carried on in West Island Lagoon of Ashmore Reef National Nature Reserve.
- Fishing for immediate consumption in West Island Lagoon must be carried on in accordance with subregulations 12.35(3) and (4) of the EPBC Regulations.
- Camping will not be allowed in the Reserves, except in connection with necessary management activities by Environment Australia and permitted research.
- The Director will not provide or approve any fireplaces within the Reserves, with the possible exception of an incinerator for management purposes. Fires, including in a portable barbecue or stove, must not be lit on the islands.
- Develop and distribute educational and interpretive material to minimise the risk of damage to the Reserves and provide basic interpretative, safety and legal information for visitors to the Reserves. Liaison will occur with commercial tour operators to foster a sense of ownership and responsibility for the Reserves.
- Monitor visitor numbers, and visitor impacts on biodiversity values of the Reserves.
- Develop and implement an anchoring and mooring strategy for West Island Lagoon at Ashmore Reef National Nature Reserve.

6.6 Research

Although considerable work has been done to date, further scientific work is required in the Reserves and the region. Such work would provide an overview of conservation attributes, geology and geomorphology, a better understanding of the natural processes

and seasonal variations operating, and further identification of species present.

There is considerable opportunity to develop cooperative arrangements for scientific research and monitoring with a number of research organisations and agencies including: AGSO, AIMS, CSIRO, Australian museums and universities, and Indonesian research organisations.

Australian government agencies, in cooperation with Indonesian stakeholders, are continuing to look at options for management and research on a regional scale, and to integrate management of Ashmore and Cartier into a broader regional perspective.

The EPBC Regulations prohibit scientific research in Commonwealth reserves, except under a permit issued by the Director. As noted earlier in the Plan, actions that affect native species may only be carried on in a Commonwealth reserve in accordance with a management plan.

Management goals

- Conduct and facilitate research and monitoring that will increase knowledge of the natural and cultural values of the Reserves, provide information to enhance management, and measure management success.
- Ensure that research activities are appropriate and will not adversely impact on the conservation values of the Reserves and that any benefits derived from research, whether financial or non-financial, are shared.

Management strategies

- Scientific research may be carried on in the Reserves in accordance with a permit issued by the Director under the EPBC Regulations.
- Native species may be killed, kept or moved for the purposes of research subject to permit conditions.

- Applications for permits to carry out research activities in the Reserves will be considered on a case-by-case basis. The issue of permits will take into account likely impact of the proposed activity, relevant Australian IUCN reserve management principles, the strategic objectives of the Reserve, and relevant management goals. In assessing research permit applications consideration will also be given to the aim of the proposed research, ethical issues, and how knowledge derived from the proposed research may benefit the management of the Reserves.
- Research will be permitted in the areas of the Reserves zoned IUCN category Ia only where the activity: will contribute to the knowledge and management of the Reserves; and it can be clearly demonstrated that there will be no significant impact on the values of the Reserve.
- A permit condition will be that research results are shared with Environment Australia. Where provided for under the EPBC Regulations, the Director will negotiate a benefit sharing agreement with the applicant.
- Develop a research plan which will determine gaps in scientific knowledge relating to the management of the Reserves, outline research priorities for the Reserves, and encourage appropriate research.
- Where possible facilitate involvement of Indonesian researchers in research programs.
- Liaise with relevant research organisations and other agencies to enhance sharing of research results.

6.7 Australian commercial fishing

Commercial fishing in a Commonwealth reserve is subject to section 354(1)(a) and (f) of the EPBC Act and may only be carried on in accordance with a management plan for the reserve. Where a management plan allows commercial fishing to be carried on it may be further regulated by the EPBC Regulations (regulation 12.34).

Commercial fishing by Australian fishers in the region of the Reserves has historically been very limited. Commercial fishing

would be likely to impact on the structure, productivity, function and biological diversity of the ecosystem of the Reserves.

Management goals

- Protect the Reserves from extractive commercial activity.

Management strategies

- Commercial fishing and aquaculture will not be allowed in the Reserves.
- Liaise with AFMA and Fisheries Western Australia to ensure commercial fishing vessels operating in the region observe Reserve boundaries. Examples of relevant approaches include reference to the exclusion of commercial fishing in the Reserves in relevant Fisheries Management Plans, and inclusion of conditions excluding the Reserves in fishing permits issued in the region.
- Liaise with relevant authorities to ensure adequate enforcement and compliance with these restrictions as part of the Compliance and Enforcement Plan for the Reserves.
- Maintain a management and surveillance presence as part of the Compliance and Enforcement Plan for the Reserves.

6.8 Mining operations

The EPBC Act prohibits mining operations in a Commonwealth reserve unless approved by the Governor-General and carried on in accordance with a management plan for the reserve (section 355).

A constructive relationship exists between Environment Australia and the Australian Petroleum Production and Exploration Association, AGSO, and the Department of Industry Science and Resources. Close liaison with industry and government is expected to continue to ensure management of the Reserves and industry interests in the region are well balanced.

Management goals

- Protect the Reserves from extractive commercial activity.
- Minimise potential impact on the natural features of the Reserves from exploration and extraction activities in the region.

Management strategies

- Mining operations, including mineral and petroleum exploration and development, will not be allowed in the Reserves.
- Applications to carry out geophysical and geological research with broader application than petroleum and minerals exploration will be considered on a case by case basis as outlined in Section 6.6.
- Continue to liaise with the Department of Industry Science and Resources and other relevant agencies in relation to proposals for exploration and extraction in the vicinity of the Reserves.
- Seek to ensure the locations and restrictions of the Reserves are communicated directly to bidders and permit holders of adjoining petroleum blocks.

6.9 Buildings and other structures

Section 354(1) of the EPBC Act prohibits excavations, erection of buildings or other structures, or other works being carried on in a Commonwealth reserve except in accordance with a management plan for the reserve (section 354(1)(c), (d) and (e)).

There are currently no buildings or other structures in the Reserves.

Management goals

- Minimise facilities and structures in the Reserves.

Management strategies

- No facilities or structures will be erected in Cartier Island Marine Reserve or the IUCN Category Ia zone of Ashmore Reef National Nature Reserve.

- Proposals for facilities or structures in the IUCN category II zone of Ashmore Reef National Nature Reserve will be considered on a case-by-case basis.
- All proposals for facilities or structures will be required to undergo an environmental assessment.
- Only small-scale facilities or structures that are consistent with IUCN category II will be allowed.

6.10 Filming and other commercial activities

As noted earlier in the Plan, commercial activities may only be carried on in accordance with a management plan for the Reserves.

Limited commercial filming and the production of television documentaries have occurred in the past.

Management goals

- Protect the natural and cultural values of the Reserves from adverse impacts of filming and other commercial activities.

Management strategies

- Commercial filming and other commercial activities will not be allowed in the Reserves except in accordance with a permit issued by the Director under the EPBC Regulations.
- Commercial filming will be permitted in the areas of the Reserves zoned IUCN category Ia only where the activity: will contribute to knowledge and management of the Reserves; is highly restricted in terms of the extent of its operation in the Reserves; and it can be clearly demonstrated that there will be no significant impact on the values of the Reserve.
- Applications for permits to carry out commercial activities in the Reserves will be considered on a case-by-case basis. The issue of permits will take into account likely impact of the proposed activity, relevant Australian IUCN reserve management principles, the strategic objectives of the Reserve, and relevant management goals.



7. Compliance and Monitoring

7.1 Compliance and enforcement

Environment Australia contracted a vessel and crew for over a decade to implement management strategies at Ashmore Reef National Nature Reserve. The on-site vessel and crew was highly effective in managing illegal activities. This protection has resulted in Ashmore being maintained in substantially better condition than other reefs in the region (Skewes *et al.* 1999).

From May 2000 an Australian Customs Service vessel has been based at Ashmore. The vessel's primary purpose is to deal with suspected illegal immigrant vessels, passengers and crew. This vessel's crew also carries out Reserve management activities including monitoring and enforcement relating to illegal fishing activity.

A Compliance and Enforcement Plan will be developed for the Reserves, in consultation with relevant agencies including Coastwatch, Australian Customs Service, Royal Australian Navy, AFMA and Fisheries WA, to ensure that their high conservation values are protected from the impacts of a range of uses and pressures.

The Compliance and Enforcement Plan for the Reserves will comply with the Commonwealth Marine Protected Area Compliance and Enforcement Plan. The primary goals of this strategy are to encourage a high level of public awareness and support of the values of parks and reserves, maximise compliance with the relevant parts of the EPBC Act and Regulations and management plans, and enforce legislation transparently, lawfully, equitably, and fairly. These goals will be reflected in the Compliance and Enforcement Plan for the Reserves.

Other important elements of the Compliance and Enforcement Plan will be to continue to facilitate an on-site management presence at Ashmore for all or most of the year including regular patrols to Cartier, and develop surveillance, compliance and enforcement

services through cooperative approaches with agencies including Coastwatch, Australian Customs Service, Royal Australian Navy, AFMA and Fisheries WA.

An important element of the Compliance and Enforcement Plan will be the production and distribution of educational material to inform stakeholders of the purposes of the Reserves, the details of restrictions, and to raise awareness of conservation values of the Reserves.

7.2 Performance assessment

A performance assessment program for Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve will be developed following the framework provided in the *Strategic Plan of Action for the National Representative System of Marine Protected Areas: A Guide for Action by Australian Governments* (ANZECC, 1999) and the *Best Practice in Performance Reporting in Natural Resource Management* (ANZECC, 1997).

The primary purpose of the performance assessment program is to identify whether management is effective. Performance assessment also provides a means of identifying where management can be improved and also provides a basis for re-evaluating the MPA's strategic objectives, management goals and strategies, and the effectiveness of compliance and enforcement.

The performance assessment program will be applied through the identification of applicable environmental indicators, which are derived from the legislative framework, IUCN management guidelines, strategic objectives and goals, and an analysis of the biodiversity and the potential pressures on the major values of the Reserves. The indicators will measure the state (or condition of the environment), pressure (threats and impacts) and response (reaction to pressure) of the environment. Indicators will be monitored over short and long timeframes (temporal variability) and over a number of sites (spatial variability). They are developed to track changes in important elements or dynamics in the MPAs and surrounding environments and the impacts of human activities.

Baseline surveys are a necessary first step in performance assessment providing a benchmark for monitoring, and building upon existing data. A monitoring program, using the environmental indicators to document and evaluate biodiversity condition and trends over time, will be established and will build upon the baseline data.

The performance assessment framework and performance reports will be produced in consultation with relevant stakeholders.

Key elements of the performance assessment for these Reserves are:

- water quality monitoring, this will include water quality measures (turbidity, chlorophyll and nutrients) and pollution (oil)
- monitoring of key species targeted by Indonesian fishers (trochus and trepang)
- monitoring the impact of human visitation to the Reserves, specifically relating to critical habitats and mooring and anchoring of vessels
- marine and terrestrial introduced species, specifically their means of introduction and impact on natural values
- process indicators which will focus on the success of the management plan and the implementation of the management strategies.

This work will involve liaison with relevant research organisations and individuals.

7.3 Reviewing the Plan

In accordance with the EPBC Act, the management plans for the Reserves will operate for seven years unless revoked or amended sooner by another management plan for the Reserve. This Plan will be reviewed approximately two years before the expiry.

Results from the performance assessment program will be used to undertake the review of the Plan. The results of the review will be used in the development of the next Management Plan for Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve.



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Attachment 1

Memorandum of Understanding between Australia and Indonesia 1974 (as reviewed in 1989).

Memorandum of Understanding between the Government of Australia and the Government of the Republic of Indonesia regarding the Operations of Indonesian Traditional Fishermen in areas of the Australian Exclusive Fishing Zone and Continental Shelf.

Following discussions held in Jakarta on 6 and 7 November, 1974, the representatives of the Government of Australia and of the Government of the Republic of Indonesia have agreed to record the following understandings.

1. These understandings shall apply to operations by Indonesian traditional fishermen in the exclusive fishing zone and over the continental shelf adjacent to the Australian mainland and offshore islands.

By 'traditional fishermen' is meant the fishermen who have traditionally taken fish and sedentary organisms in Australian waters by methods, which have been the tradition over decades of time.

By 'exclusive fishing zone' is meant the zone of waters extending twelve miles seaward off the baseline from which the territorial sea of Australia is measured.

2. The Government of the Republic of Indonesia understands that in relation to fishing in the exclusive Australian fishing zone and the exploration for and exploitation of the living natural resources of the Australian continental shelf, in each case adjacent to:

Ashmore Reef (Pulau Pasir) (Latitude 12°15' South, Longitude 123°03' East) Cartier Islet (Latitude 12°32' South, Longitude 123°33' East)
Scott Reef (Latitude 14°03' South, Longitude 121°47' East)
Seringapatam Reef (Pulau Datu) (Latitude 11°37' South, Longitude 122°03' East) Browse Islet (Latitude 14°06' South, Longitude 123°32' East).

The Government of Australia will, subject to paragraph 8 of these understandings, refrain from applying its laws regarding fisheries to Indonesian traditional fishermen who conduct their operations in accordance with these understandings.

3. The Government of the Republic of Indonesia understand that, in the part of the areas described in paragraph 2 of these understandings where the Government of Australia is authorised by international law to regulate fishing or exploitation for or exploitation of the living natural resources of the Australian continental shelf by foreign nationals, the Government of Australia will permit operations by Indonesian nationals subject to the following conditions:
 - a. Indonesian operations in the areas mentioned in paragraph 2 of the understandings shall be confined to traditional fishermen.
 - b. Landings by Indonesian traditional fishermen shall be confined to East Islet (Latitude 12°15' South, Longitude 123°07' East) and Middle Islet (Latitude 12°15' South, Longitude 123°03' East) of Ashmore Reef for the purpose of obtaining supplies of fresh water.
 - c. Traditional Indonesian fishing vessels may take shelter within the island groups described in paragraph 2 of these understandings but the persons on board shall not go ashore except as allowed in (b) above.
4. The Government of the Republic of Indonesia understands, that the Indonesian fishermen will not be permitted to take turtles in Australian exclusive fishing zone. Trochus, beche de mer, abalone, green snail, sponges and all molluscs will not be taken from the seabed from high water marks to the edge of the continental shelf, except the seabed adjacent to Ashmore and Cartier Islands, Browse Islet and the Scott and Seringapatam Reserve.

5. The Government of the Republic of Indonesia understands that the persons on board Indonesian fishing vessels engaging in fishing in the exclusive Australian fishing zone or exploring for or exploiting the living natural resources of the Australian continental shelf, in either case in areas other than those specified in paragraph 2 of these understandings, shall be subject to the provisions of Australian law.
6. The Government of Australia understands that the Government of the Republic of Indonesia will use its best endeavours to notify all Indonesian fishermen likely to operate in areas adjacent to Australia of the contents of these understandings.
7. Both Governments will facilitate the exchange of information concerning the activities of the traditional Indonesian fishing boats operating in the area west of the Timor Sea.
8. The Government of the Republic of Indonesia understands that the Government of Australia will, until the twenty-eighth day of February 1975, refrain from applying its laws relating to fisheries to Indonesian traditional fishermen in areas of the Australian exclusive fishing zone and continental shelf other than those specified in paragraph 2 of these understandings.

Jakarta, 7 November 1974

First Assistant Secretary
Fisheries Division
Australian Department of Agriculture
(A.G. Bollen)

Director of Consular Affairs
Department of Foreign Affairs of Indonesia
(Agus Yaman)

Agreed Minutes of meeting between officials of Australia and Indonesia on fisheries – 1989 – Update and Revision of the 1974 MOU

1. In accordance with the agreement reached by Mr Ali Alatas, the Foreign Minister of Indonesia and Senator Gareth Evans, the Foreign Minister of Australia in Canberra on 2 March 1989, Officials from Indonesia and Australia met in Jakarta on 28 and 29 April 1989 to discuss activities of Indonesian fishing vessels under the Memorandum of Understanding between the Government of the Republic of Indonesia and the Government of Australia regarding the operation of Indonesian traditional fishermen in an Area of the Australian Fishing Zone and Continental Shelf, concluded in Jakarta on 7 November 1974. They also discussed activities of Indonesian fishing vessels in the Australian Fishing Zone off the coast of North West Australia and in the Arafura Sea, and fishing in the waters between Christmas Island and Java.

Memorandum of Understanding of 1974

2. Officials reviewed the operation of the MOU. Both sides stressed their desire to address the issues in a spirit of cooperation and good neighbourliness. They noted that there had been a number of developments since 1974, which had affected the MOU. In 1974 Australia and Indonesia exercised jurisdiction over fisheries on 12 nautical miles from their respective territorial sea baselines. In 1979 and 1980, Australia and Indonesia respectively extended their fisheries jurisdiction to 200 nautical miles from their respective territorial sea baselines, and in 1981 a provisional fishing line was agreed. Since the areas referred to in the MOU are south of this line, new arrangements are necessary for the access by Indonesian traditional fishermen to these areas under the MOU.
3. The Australian side informed the Indonesian side that there were also changes in the status of Ashmore Reef and Cartier Islet as a separate territory of the Commonwealth of Australia and the establishment of the Ashmore Reef National Nature Reserve. The Australian side further informed that there had been a considerable increase in the number of Indonesian fishermen visiting the Australian Fishing Zone and a depletion of fishery stocks around the Ashmore Reef; that wells on Middle Islet and

East Islet where Indonesian traditional fishermen were permitted under the MOU to land for taking fresh water had been contaminated; that Australia had also incurred international obligations to protect wildlife, including that in the territory of Ashmore and Cartier Islands. The Indonesian side took note of this information.

4. Since the conclusion of the MOU, both Indonesia and Australia had become parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
5. The Indonesian and Australian Officials discussed the implications of the developments mentioned in the preceding paragraphs. They affirmed the continued operation of the MOU for Indonesian traditional fishermen operating by traditional methods and using traditional fishing vessels. An Australian proposal that Indonesian traditional fishermen could conduct fishing not only in the areas adjacent to Ashmore Reef, Cartier Islet, Scott Reef, Seringapatam Reef and Browse Islet as designated in the MOU, but in a wider 'box' area in the Australian Fishing Zone and Continental Shelf was welcomed by the Indonesian side. A sketch map and coordinates of this 'box' area appears in Annex 1 of this Agreed Minutes
6. In view of the developments that had occurred since 1974 as highlighted above, Officials considered that to improve the implementation of the MOU, practical guidelines for implementing the MOU as appears in the Annex of these Agreed Minutes were considered necessary.
7. The Indonesian side informed the Australian side on measures that had been and were being taken by the Indonesian authorities to prevent breaches of the MOU. The Indonesian side also indicated its willingness to assist in preventing breaches of the MOU and to take necessary steps to inform Indonesian fishermen of the practical guidelines annexed to this Agreed Minutes.
8. The Indonesian and Australian Officials agreed to make arrangements for cooperation in developing alternative income projects in Eastern Indonesia for traditional fishermen traditionally engaged in fishing under the MOU. The Indonesian side indicated they might include mariculture and nucleus fishing

enterprise scheme (Perikanan Inti Rakyat or PIR). Both sides mutually decided to discuss the possibility of channelling Australian aid funds to such projects with appropriate authorities in their respective countries.

North West Coast of Australia

9. The Indonesian and Australian Officials discussed matters related to the activities of Indonesian fishing vessels in the Australian Fishing Zone off the coast of North West Australia. They noted that those activities were outside the scope of the MOU and that Australia would take appropriate enforcement action. The Australian side indicated the legal and economic implications of such activities.
10. The Indonesian and Australian Officials felt the need for a long-term solution to the problem. To this end, they agreed to make arrangements for cooperation in projects to provide income alternatives in Eastern Indonesia for Indonesian fishermen engaged in fishing off the coast of North West Australia. The Indonesian side indicated that they might include mariculture and nucleus fishing enterprise scheme (Perikanan Inti Rakyat or PIR). Both sides decided mutually to discuss the possibility of channelling Australian aid funds to such projects with appropriate authorities in their respective countries.

Arafura Sea

11. Indonesian and Australian Officials discussed the activities of Indonesian non-traditional fishing vessels in the Arafura Sea on the Australian side of the provisional fishing line of 1981. Officials agreed that both Governments should take effective measures, including enforcement measures, to prevent Indonesian non-traditional fishing vessels from fishing on the Australian side of the provisional fishing line without the authorisation of the Australian authorities.
12. Officials agreed to make arrangements for cooperation in exchange of information on shared stocks in the Arafura Sea for the purpose of effective management and conservation of the stocks.

Fishing in waters between Christmas Island and Java and other waters

13. The Officials of Indonesia and Australia noted that fisheries delimitation in waters between Christmas Island and Java and in the west of the provisional fishing line remained to be negotiated and agreed. Pending such an agreement, the Officials noted that both Governments would endeavour to avoid incidents in the area of overlapping jurisdictional claims.

Wildlife Cooperation

14. The Indonesian and Australian Officials considered the mutual advantages of the exchange of information on wildlife species populations believed to be common to both countries. It was agreed that each country's nature conservation authorities would exchange information on such wildlife populations and management programs and cooperation in the management of wildlife protected areas. In the first instance Indonesian authorities would be consulted on the management plan for the Ashmore Reef National Nature Reserve.

Consultations

15. The Indonesian and Australian Officials agreed to hold consultations as and when necessary to ensure the effective implementation of the MOU and Agreed Minutes.

Jakarta, 29 April 1989

Alan Brown

Head of the Australia Delegation

Nugroho Wisnumurti

Head of the Indonesia Delegation

Practical Guidelines for Implementing the 1974 MOU

1. Access to the MOU area would continue to be limited to Indonesian traditional fishermen using traditional methods and traditional vessels consistent with the tradition over decades of time, which does not include fishing methods or vessels utilising motors or engines.
2. The Indonesian traditional fishermen would continue to conduct traditional activities under the MOU in the area of the Australian Fishing Zone and the continental shelf adjacent to Ashmore Reef, Cartier Islet, Scott Reef, Seringapatam Reef and Browse Islet. In addition Indonesian traditional fishermen would be able to conduct traditional fishing activities in an expanded area as described in the sketch map and coordinates attached to Annex I of the Agreed Minutes.
3. To cope with the depletion of certain stocks of fish and sedentary species in the Ashmore Reef area, the Australian Government had prohibited all fishing activities in the Ashmore Reef National Nature Reserve, but was expected soon to adopt a management plan for the Reserve which might allow some subsistence fishing by the Indonesian traditional fishermen. The Australian side indicated that Indonesia would be consulted on the draft plan. Because of the low level of stock, the taking of sedentary species particularly *Trochus niloticus* in the Reserve would be prohibited at this stage to allow stocks to recover. The possibility of renewed Indonesian traditional fishing of the species would be considered in future reviews of the management plan.
4. As both Australia and Indonesia are parties to CITES, Officials agreed that any taking of protected wildlife including turtles dugongs and clams, would continue to be prohibited in accordance with CITES.
5. Indonesian traditional fishermen would be permitted to land on West Islet for the purpose of obtaining supplies of fresh water. The Indonesian side indicated its willingness to discourage Indonesian traditional fishermen from landings on East and Middle Islets because of the lack of fresh water on the two islets.

Attachment 2

Proclamation of Ashmore Reef National Nature Reserve

Commonwealth of Australia Gazette
No. G 32, 16 August 1983

Proclamations 2455

PROCLAMATION

Commonwealth of
Australia
N. M. STEPHEN
Governor-General

By His Excellency the
Governor-General of
the Commonwealth of
Australia

WHEREAS it is provided by sub-section (2) of section 7 of the *National Parks and Wildlife Conservation Act 1975* that, amongst other things, the Governor-General may, by Proclamation, declare an area specified in the Proclamation to be a reserve and assign a name to that reserve:

AND WHEREAS it is provided by sub-section (11) of that section that the Governor-General shall not make a Proclamation under that section, other than a Proclamation in relation to certain land or sea in the Northern Territory of Australia referred to in sub-section (11A) of that section, except after consideration by the Federal Executive Council of a report by the Director of National Parks and Wildlife in relation to the matter dealt with by the Proclamation:

AND WHEREAS the Federal executive Council has considered a report by the Director of National Parks and Wildlife in relation to the declaration of the area specified in the Schedule to be a reserve:

NOW THEREFORE I, Sir Ninian Martin Stephen, the Governor-General of the Commonwealth of Australia, acting with the advice of the Federal Executive Council, hereby:

- (a) declare the area specified in the Schedule to be a reserve;
- (b) assign the name 'Ashmore Reef National Nature Reserve' to that reserve; and
- (c) specify the depth of 200 metres for the purposes of paragraphs (6) (a) and (6) (c) of that section.

SCHEDULE

Ashmore Reef National Nature Reserve

The area the boundary of which:

- (1) commences at the point of Longitude 123° 00' East Latitude 12° 10' South;
- (2) runs thence east along the parallel of 12° 10' South to its intersection by the meridian of Longitude 123° 14' East;
- (3) runs thence south-easterly along the geodesic to the point of Longitude 123° 16' East Latitude 12° 13' South;
- (4) runs thence south along the meridian of 123° 16' East to its intersection by the parallel of Latitude 12° 16' South;
- (5) runs thence south-westerly along the geodesic to the point of Longitude 123° 10' East Latitude 12° 20' South;
- (6) runs thence north-westerly along the geodesic to the point of Longitude 123° 00' East Latitude 12° 19' South;
- (7) runs thence north-westerly along the geodesic to the point of Longitude 122° 53' East Latitude 12° 14' South;
- (8) runs thence north-easterly along the geodesic to the point of Longitude 122° 55' East Latitude 12° 12' South;
- (9) runs thence north-easterly along the geodesic to the point of commencement.

(L.S.) GIVEN under my Hand and the Great Seal of Australia on the 28th day of July 1983.

By His Excellency's Command,

BARRY COHEN

Minister of State for

Home Affairs and Environment



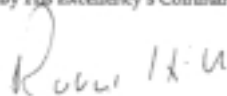
GOD SAVE THE QUEEN!

(Ex. Min. No. 14)



Attachment 3

Proclamation of Cartier Island Marine Reserve

<p>1550 Government departments</p>	<p><i>Commonwealth of Australia Gazette</i> No. G11 34, 21 June 2000</p>
<hr/> Environment and Heritage <hr/>	
	
<p>PROCLAMATION</p> <p><i>National Parks and Wildlife Conservation Act 1975</i></p>	
<p>I, WILLIAM PATRICK DEANE, Governor-General of the Commonwealth of Australia, acting with the advice of the Federal Executive Council and under subsection 7(2) of the National Parks and Wildlife Conservation Act 1975;</p>	
<p>(a) declare the area specified in the Schedule to be a Reserve; and</p>	
<p>(b) assign to the Reserve the name "Cartier Island Marine Reserve"; and</p>	
<p>(c) specify that the subsoil extending to a depth of 1000 metres below the sea-bed within the declared area is within the Reserve.</p>	
	<p>Signed and sealed with the Great Seal of Australia on 7 June 2000</p>
<p>WILLIAM DEANE Governor-General</p>	
<p>By His Excellency's Command</p> <p></p> <p>Robert Hill Minister for the Environment and Heritage</p>	

Schedule

Cartier Island Marine Reserve

All the area of land and Australian coastal sea enclosed within the circumference of a circle of radius 4 nautical miles, the centre of which is on an island in the Indian Ocean known as Cartier Island at latitude 12°51'50.8" South and longitude 123°33'18.8" East.

All co-ordinates are referred to the Geocentric Datum of Australia 1994 (GDA94).



Attachment 4

Some species present in Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve protected under the EPBC Act as listed marine species (section 248)

Listed marine species are protected under the EPBC Act (section 248). All cetaceans are protected under the EPBC Act (sections 224–232). Listed threatened species (section 178) and listed migratory species (section 209) are also protected.

A number of species in the Reserve are listed marine species. Species included in this table as listed marine species may also be listed as threatened or migratory. Other species present in the Reserves may also be protected under these provisions.

Sea birds and migratory birds

Wedge-tailed Shearwater	<i>Puffinus pacificus</i>
Wilson's Storm-Petrel	<i>Oceanites oceanicus</i>
Masked Booby	<i>Sula dactylatra</i>
Brown Booby	<i>Sula leucogaster</i>
Red-footed Booby	<i>Sula sula</i>
Great Frigatebird	<i>Fregata minor</i>
Least Frigatebird	<i>Fregata ariel</i>
White-tailed tropicbird	<i>Phaethon lepturus</i>
Great Egret	<i>Ardea alba</i>
Eastern Reef Egret	<i>Egretta sacra</i>
American Golden Plover	<i>Pluvialis dominica</i>
Grey Plover	<i>Pluvialis squatarola</i>
Mongolian Plover	<i>Charadrius mongolus</i>
Large Sand Plover	<i>Charadrius leschenaultii</i>
Ruddy Turnstone	<i>Arenaria interpres</i>
Eastern Curlew	<i>Numenius madagascariensis</i>
Whimbrel	<i>Numenius phaeopus</i>
Little Curlew	<i>Numenius minutus</i>
Greenshank	<i>Tringa nebularia</i>
Marsh Sandpiper	<i>Tringa stagnatilis</i>
Common Redshank	<i>Tringa totanus</i>
Bar-tailed Godwit	<i>Limosa lapponica</i>
Black Tailed Godwit	<i>Limosa limosa</i>
Red Knot	<i>Calidris canutus</i>
Great Knot	<i>Calidris tenuirostris</i>

Red-necked Stint	<i>Calidris ruficollis</i>
Sanderling	<i>Calidris alba</i>
Curlew Sandpiper	<i>Calidris ferruginea</i>
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>
Broad-billed Sandpiper	<i>Limicola falcinellus</i>
White-winged Tern	<i>Chlidonius leucoptera</i>
Bridled Tern	<i>Sterna anaethetus</i>
Little Tern	<i>Sterna albifrons</i>
Crested Tern	<i>Sterna bergii</i>
Lesser Crested Tern	<i>Sterna bengalensis</i>
Common Tern	<i>Sterna Hirundo</i>
Common Noddy	<i>Anous stolidus</i>
Oriental Cuckoo	<i>Cuculus saturatus</i>
Fork-tailed Swift	<i>Apus pacificus</i>
Yellow Wagtail	<i>Motacilla flava</i>
Asian Dowitcher	<i>Limnodromus semipalmatus</i>
Barn Swallow	<i>Hirundo rustica</i>
Rainbow Bee-eater	<i>Merops ornatus</i>

(All are listed on the JAMBA or CAMBA agreements)

Turtles

Green Turtle	<i>Chelonia mydas</i>
Hawksbill Turtle	<i>Eretmochelys imbricata</i>
Loggerhead Turtle	<i>Caretta caretta</i>

(All are listed on CITES appendices and under IUCN)

Sea snakes

Olive sea snake	<i>Aipysurus laevis</i>
Horned Sea Snake	<i>Acalyptophis peronii</i>
Stoke's sea snake	<i>Astrotia stokesii</i>
Elegant sea snake	<i>Hydrophis elegans</i>
Cogger's sea snake	<i>Hydrophis coggeri</i>
no common name	<i>Hydrophis ornatus</i>
Hardwick's sea snake	<i>Lapemis hardwickii</i>
Dubois's sea snake	<i>Aipysurus duboisii</i>
no common name	<i>Aipysurus apraefrontalis</i> – until recently known only to Ashmore
no common name	<i>Aipysurus foliosquama</i> – recorded only from Ashmore and Hibernia Reef
no common name	<i>Aipysurus fuscus</i> – may be endemic to Ashmore, Cartier and Hibernia Reefs
no common name	<i>Pelamis platurus</i>
no common name	<i>Distiera kingii</i>

Mammals

Dugong dugon (listed under IUCN, listed in CITES appendices)



Attachment 5

Some Commonwealth Legislation relevant to this Plan

- The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) commenced on 16 July 2000. The EPBC Act, and associated *Environmental Reform (Consequential Provisions) Act 1999*, have replaced the *National Parks and Wildlife Conservation Act 1975*, *Environment Protection (Impact of Proposals) Act 1974*, *Endangered Species Protection Act 1992*, *Whale Protection Act 1980*, *World Heritage Properties Conservation Act 1983* and the *Wildlife Protection (Regulation of Exports and Imports) Act 1982*. Some parts of the EPBC Act relevant to this Plan are described in Section 2 of the Plan.
- The *Historic Shipwrecks Act 1976* provides protection for all shipwrecks and relics over seventy-five years of age in waters under Commonwealth responsibility and for specific wrecks declared under sections 5 or 6 of the Act. Protected zones may be declared (section 7) around historic shipwrecks to prevent unauthorised access.
- The *Australian Heritage Commission Act 1975* requires any Commonwealth department or agency proposing an action significantly affecting a place listed on the Register of the National Estate to refer the proposal to the Australian Heritage Commission for consideration. If there are no feasible or prudent alternatives, all reasonable measures must be taken by the department or agency to minimise any damaging effects.
- The *Petroleum (Submerged Lands) Act 1967* and directions and regulations issued under the Act control the petroleum exploration and extraction activities on the continental shelf beyond the Territorial Sea.
- The *Offshore Minerals Act 1994* controls exploration for and the extraction of minerals other than petroleum on the continental shelf beyond the Territorial Sea.

- The *Fisheries Management Act 1991* regulates the fishing operations of all persons, including foreign persons, and all boats, including foreign boats within the Australian Fishing Zone. The Act also has some application to Australians and Australian fishing boats that are outside the Australian Fishing Zone.
- The *Environment Protection (Sea Dumping) Act 1981* controls, regulates and monitors sea dumping operations and gives effect to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matters.
- The *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* and the *Navigation (Protection of the Sea) Amendment Act 1983* give effect to the International Convention for the Prevention of Pollution from Ships (MARPOL) which came into effect internationally in October 1983. Discharges of oil and noxious chemicals from merchant ships and discharges of garbage, including plastic material, from all Australian ships are regulated under this legislation.



Attachment 6

Instrument of Prohibition of access to areas of Ashmore Reef National Nature Reserve

COMMONWEALTH OF AUSTRALIA

INSTRUMENT OF PROHIBITION

NATIONAL PARKS AND WILDLIFE REGULATIONS

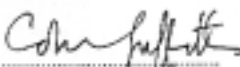
Regulation 31(2)


I, Colin Griffiths, Director of National Parks and Wildlife, acting pursuant to regulation 31(2) of the National Parks and Wildlife Regulations and having reasonable cause to believe that it is necessary to prohibit access to the park or reserve or that part of the park or reserve specified in Part I of the Schedule hereto by the person or class of persons specified in Part II of the Schedule to protect and preserve wildlife
HEREBY PROHIBIT ACCESS to that area by that person or class of persons.

Furthermore, I HEREBY REVOKE the prohibition on access to the said park or reserve made pursuant to regulation 3(2) on September 24th 1988.

Dated 3 September 1987

The Seal of the Director of National Parks and Wildlife was hereunto affixed in my presence:)


COLIN GRIFFITHS
Director of National Parks and Wildlife



SCHEDULE

Part I

All that part of Ashmore Reef National Nature Reserve being outside the area bounded by lines described as follows:

- (a) commencing at the intersection of the parallel of latitude 12 degrees 10 minutes south with the meridian of longitude 123 degrees east;
- (b) thence southerly by a straight line to the intersection of the parallel of latitude 12 degrees 12 minutes 51 seconds south with the meridian of longitude 122 degrees 59 minutes 36 seconds east;
- (c) thence southeasterly by a straight line to the intersection of the parallel of latitude 12 degrees 13 minutes 11 seconds south with the meridian of longitude 123 degrees 44 seconds east;
- (d) thence southwesterly by a straight line to the intersection of the parallel of latitude 12 degrees 13 minutes 23 seconds south with the meridian of longitude 123 degrees 26 seconds east;
- (e) thence south along that meridian to the parallel of latitude 12 degrees 13 minutes 44 seconds south;
- (f) thence east along that parallel to the meridian of longitude 123 degrees 1 minute 15 seconds east;
- (g) thence southwesterly by a straight line to the intersection of the parallel of latitude 12 degrees 14 minutes 33 seconds south with the meridian of longitude 123 degrees 17 seconds east;
- (h) thence west along that parallel to the meridian of longitude 122 degrees 59 minute 5 seconds east;
- (i) thence southwesterly by a straight line to the southeastern most point on the coastline of West Island along the high water mark;
- (j) thence generally northwesterly along that high water mark to the intersection of the parallel of latitude 12 degrees 14 minutes 29.152 seconds south with the meridian of longitude 122 degrees 58 minutes 8.116 seconds east;
- (k) thence southwesterly by a straight line to the intersection of the parallel of latitude 12 degrees 14 minutes 33.687 seconds south with the meridian of longitude 122 degrees 58 minutes 1.064 seconds east;

- (l) thence northwesterly by a straight line to the intersection of the parallel of latitude 12 degrees 14 minutes 32.325 seconds south with the meridian of longitude 122 degrees 58 minutes 0.158 seconds east;
 - (m) thence northeasterly by a straight line to the intersection of the parallel of latitude 12 degrees 14 minutes 27.385 seconds south with the meridian of longitude 122 degrees 58 minutes 7.14 seconds east;
 - (n) thence generally northwesterly and westerly along the high water mark of the coastline of West Island to the northeastern most point of the Island along that high water mark;
 - (o) thence east-northeasterly by a straight line to the intersection of the parallel of latitude 12 degrees 14 minutes 15 seconds south with the meridian of longitude 122 degrees 59 minutes 4 seconds east;
 - (p) thence northeasterly by a straight line to the intersection of the parallel of latitude 12 degrees 13 minutes 37 seconds south with the meridian of longitude 123 degrees 2 seconds east;
 - (q) thence north along that meridian to the parallel of latitude 12 degrees 13 minutes 37 seconds south;
 - (r) thence northwesterly by a straight line to the intersection of the parallel of latitude 12 degrees 13 minutes 12 seconds south with the meridian of longitude 122 degrees 59 minutes 2 seconds east;
 - (s) thence northwesterly by a straight line to the intersection of the parallel of latitude 12 degrees 12 minutes south with the meridian of longitude 122 degrees 55 minutes east;
 - (t) thence northeasterly by a straight line to the point of commencement
- and being more particularly shown on the plan annexed hereto

Part II

All persons other than officers, servants and agents of the Commonwealth of Australia and its authorities acting in the course of their duties.



Attachment 7

Australian Reserve Management Principles relevant to the Reserves

The reserve management principles under the EPBC Regulations that apply to the category strict nature reserve (IUCN category Ia) are as follows.

- The reserve or zone should be managed primarily for scientific research or environmental monitoring based on the following principles;
- Habitats, ecosystems and native species should be preserved in as undisturbed a state as possible;
- Genetic resources should be maintained in a dynamic and evolutionary state;
- Established ecological process should be maintained;
- Structural landscape features or rock exposures should be safeguarded;
- 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;
- Disturbance should be minimised by careful planning and execution of research and other approved activities; and
- Public access should be limited to the extent it is consistent with these principles.

The reserve management principles under the EPBC Regulations that apply to the category national park (IUCN category II) are as follows.

- The Reserve or zone should be protected and managed to preserve its natural condition according to the following principles.

- Natural and scenic areas of national and international significance should be protected for spiritual, scientific, educational, recreational or tourist purposes.
- 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.
- 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.
- Management should seek to ensure that exploitation or occupation inconsistent with these principles do not occur
- Respect should be maintained for the ecological, geomorphological, sacred and aesthetic attributes for which the reserve or zone was assigned to this category
- 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
- 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.