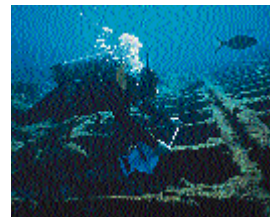
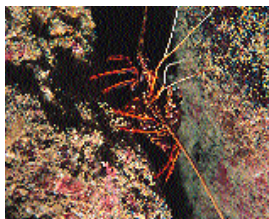


DRAFT

# MANAGEMENT OF THE HOUTMAN ABROLHOS SYSTEM



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Prepared by the Abrolhos Islands Management Advisory Committee  
in conjunction with Fisheries Western Australia

Fisheries Management Paper No. 104

DECEMBER 1997



Management of the Houtman Abrolhos System  
Draft version: December 1997

Compiled by Kim Nardi and prepared on behalf of the  
Minister for Fisheries by the Abrolhos Islands  
Management Advisory Committee.

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Abrolhos Islands  
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Western Rock Lobster (*Panulirus cygnus*)  
Photographer: Clay Bryce, WA Museum

Lesser Noddy  
Photographer: Clay Bryce, WA Museum

'Ben Ledi' Wreck Site, Pelsaert Island  
Photographer: Patrick Baker, WA Maritime Museum

## Minister's Foreword

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The Houtman Abrolhos Islands are well known to all Western Australians. The islands and the waters which surround them are of distinct environmental and historical significance. The high value of the islands to many sectors of the community is also recognised - the marine waters are integral to the valued western rock lobster fishing industry, extensive scientific and historical research is undertaken on and around the islands; and interest from the recreation and tourist industries is growing. Demand for use of this unique environment is increasing the need for careful and coordinated management.



In 1994 when the new *Fish Resources Management Act* was passed by Parliament, I was given, as Minister for Fisheries, specific powers to manage the Abrolhos Islands. At this time the Government also endorsed the establishment of a Fish Habitat Protection Area in the State Territorial Waters surrounding the islands.

In order to effectively coordinate management I established the Abrolhos Islands Management Advisory Committee (AIMAC) in April 1996. AIMAC's first major task has been to oversee the preparation of a plan of management for the islands and for the proposed Fish Habitat Protection Area. AIMAC has done an excellent job in putting together the draft plans and in doing so have established a high level of credibility and trust within the community. I commend the endeavours of AIMAC in coordinating this work on my behalf.

The draft plans provide a blue print for future management of the islands and their surrounding waters. Importantly the plans provide for an improved level of access for all user and interest groups, improved cooperation and coordination between State agencies with management responsibilities, and the development of communication strategies which will increase opportunities for the public to learn about the island environment.

In regard to the State Territorial Waters surrounding the islands, the proposed Fish Habitat Protection Area will provide a higher level of protection for marine flora and fauna with particular emphasis on a comprehensive set of new strategies to manage and restore depleted fin fish stocks.

The draft plans are now available for public comment for a three month period. I urge you to read them and provide your comments to Fisheries WA. Comments received will be carefully considered in preparation of a final plan. I am confident that once finalised the plan will provide an improved future for the islands.

A handwritten signature in black ink, appearing to read 'Monty House', written in a cursive style.

Monty House MLA  
MINISTER FOR PRIMARY INDUSTRY; FISHERIES

## Chairman's Foreword

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One of the principal tasks faced by the Abrolhos Islands Management Advisory Committee has been to formulate the first comprehensive management plan to be applied to the Abrolhos Islands. Unlike management plans which may apply to other areas significant to the fishing industry, management of the Abrolhos Islands is rendered more difficult because of the significant commercial, conservation, cultural and historic factors affecting the islands and their use.

Achieving a balance of those uses (which, on occasions, may be in conflict) represents a challenge both for the Committee and for the wider community.

The Committee has been gratified by the level of interest shown in the Abrolhos Islands and their protection and prudent use and looks forward to further constructive debate to ensure that the significant values represented by the Abrolhos Islands and their surrounding reefs and waters can be properly identified and appropriately managed and maintained.



A handwritten signature in black ink, appearing to read 'M. Hardy', enclosed within a large, stylized, hand-drawn oval shape.

Michael Hardy

CHAIRMAN

ABROLHOS ISLANDS MANAGEMENT ADVISORY COMMITTEE

## Acknowledgments

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The past and present members of the Abrolhos Islands Management Advisory Committee both individually and collectively contributed immensely to the preparation of this draft plan. The following persons should be recognised for their contribution: Michael Hardy, Pel Robson, John Fitzhardinge, Alex Lamond, Peter Driscoll, Anne Franks, John Ritchie, Nathan Evans, Dr Fred Wells, Colin Chalmers, Greg Leaman, Dr Patrick Berry, Dr David Sutton, Michael Meinema and Kim Nardi.

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The commercial and recreational fishing associations of the Mid-West Region provided important advice and information on fish stocks and fishing areas at the Abrolhos. To everyone who has contributed submissions to this and previous studies on the Abrolhos Islands and their management, thank you.

Finally, the editors Steve Ireland and Rob Finlayson, the typists Natalie Littlefair, Jane Bailye, Louise Watson and Judith Hill, and the desktop publisher Liz Berry are due special thanks for their extensive effort in finalising the document.

# List of Acronyms

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There are a number of acronyms used in the Management of the Houtman Abrolhos System document. These are:

Abrolhos Islands Consultative Council (AICC)  
Abrolhos Islands Land Management Subcommittee (AILMSC)  
Abrolhos Islands Management Advisory Committee (AIMAC)  
Australian Maritime Safety Authority (AMSA)  
British Phosphate Commission (BPC)  
Commonwealth Scientific and Industrial Research Organisation (CSIRO)  
Environmental Protection Authority (EPA)  
Fish Habitat Protection Area (FHPA)  
Fisheries Western Australia (FWA)  
Geographic Information System (GIS)  
International Maritime Organisation (IMO)  
Particularly Sensitive Sea Area (PSSA)  
Reef Observation Areas (ROA)  
Rock Lobster Industry Advisory Committee (RLIAC)  
State Emergency Service (SES)  
University of Western Australia (UWA)  
Western Australian Department of Conservation and Land Management (CALM)  
Western Australian Department of Minerals and Energy (DOME).  
Western Australian Department of Transport (DOT)  
Western Australian Fire Brigade (WAFB)  
Western Australian Museum (WAM)  
Western Australian Police Service (WAPS)

# Preface: The Management of the Abrolhos System

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## 1.0 Background and outline of this report

The Houtman Abrolhos Islands (Figure 1) and adjoining State Territorial Waters (Figure 2), hereinafter “the Abrolhos System”, is an important part of the Western Australian environment.

The Abrolhos System is of major significance for the conservation of flora and fauna, and also significant in geological terms. In addition, the adjoining State Territorial Waters contain some of the most highly valued marine systems in the State. Further, these waters include the sites of some of the most historically important historic shipwrecks in Australia, with associated historic sites located on the islands themselves. These natural and cultural features are of great interest to visitors and support a relatively small, but growing, recreation and tourist industry.

The area is integral to the *western rock lobster* fishery, which is one of the State’s premier primary industries. The waters are a principal breeding habitat for *western rock lobsters* and a substantial source of lobster product. Some of the Islands provide the land-based sites required by the fishery to support its operations.

The Islands are an A-Class Reserve (A20253) vested in the Minister for Fisheries for the conservation of flora and fauna, tourism and purposes associated with the fishing industry. They are managed by Fisheries WA under regulations established pursuant to the *Fish Resources Management Act 1994 (WA)*.

In November 1995 Cabinet resolved that the Minister for Fisheries would establish the Abrolhos Islands Management Advisory Committee (AIMAC) pursuant to Section 42 of the *Fish Resources Management Act 1994*. The role of AIMAC is to advise the Minister for Fisheries about the management of the Abrolhos Islands and the adjoining State Territorial Waters, as detailed in Section 2.2.3.1 of this report. The AIMAC has overseen the preparation of this report on behalf of the Minister for Fisheries.

This draft report contains a brief description of the Abrolhos System and its special values. It also states goals and objectives for management during the next five years, along with strategies to achieve these objectives. The report provides a ‘blue print’ for the future management of the area.

Schedule 1 attached to this report is the draft plan of management for the Abrolhos Islands Fish Habitat Protection Area, which will be established pursuant to Section 115 of the *Fish Resources Management Act 1994*. This is a separate draft plan which has been prepared to meet the requirements of Section 117 of the *Fish Resources Management Act 1994*. It contains a legal description of the area and the recommendations in this report which relate to the management of the proposed Fish Habitat Protection Area.

Both plans are in draft form and will be available for public comment for a period of three months. Following this period a final management plan will be prepared taking account of comments received.

## 2.0 Summary of Strategies

The strategies that follow are given sequentially, in the order they appear in the various sections of the *Management of the Houtman Abrolhos System* document. There is a total of 118 strategies.

It should be noted that those strategies relating to the management of the Houtman Abrolhos Islands Fish Habitat Protection Area can also be found in Appendix A (Schedule 1) of this document.

### **Other Agencies and Relevant Acts**

#### *Immediate*

1. Develop Memoranda of Understanding between Fisheries WA and other relevant organisations which detail management arrangements and maximise Governmental efficiency through coordination of responsibilities, staff, equipment, vessels, and provision of information. (FWA)

#### *Ongoing*

2. Continue to support and assist AIMAC in order to coordinate all agencies with legislative responsibilities, community groups and individuals to ensure management of the Abrolhos is integrated and in accord with appropriate legislation. (FWA)

### **Building Standards**

#### *Immediate*

3. Prepare and implement building standards which meet Australian Standards Association specifications and are consistent with the values of the Abrolhos System for all developments. (AIMAC, FWA)

### **Leases and Licences for Development Purposes**

#### *Immediate*

4. Develop lease and licensing arrangements for all developments on the islands. These arrangements will cover jetties, camps and other buildings. (FWA, AIMAC, Crown Solicitor)

### **Land-Use Planning**

#### *Immediate*

5. Develop disaster emergency plans for fires and cyclones. (FWA, WAPS, SES and WAFB)
6. Prepare land-use plans for all development sites on the islands which are consistent with the natural and heritage values of the Abrolhos. (AIMAC, FWA)

#### *Ongoing*

7. Retain the Abrolhos Islands Land Management Sub-committee (AILMSC) to advise AIMAC on the planning and management of developed sites, and to ensure island residents are properly consulted in relation to decisions which affect them. (AIMAC)
8. Review the Abrolhos Islands Regulations and keep them continually updated. (AIMAC, FWA)
9. Consider the formation of other sub-committees to provide quality advice to AIMAC on specific issues. (AIMAC)

### **Waste Disposal**

#### *Immediate*

10. Develop a waste management strategy to ensure that pollution caused by human activities is minimised. Among other things the strategy should specifically result in the:
  - proper disposal of flammable wastes;
  - establishment of an appropriate monitoring program to assess the environmental impact of nutrient pollution in lagoonal waters from human activities.
  - proper disposal of liquid wastes and an associated water quality monitoring program in the vicinity of outfalls; and



- disposal of solid wastes in a manner which meets the requirements of State and Commonwealth legislation. (AILMSC, FWA)

11. Immediately implement the waste management strategies. (AILMSC, FWA)

*Ongoing*

12. AILMSC will continue to advise AIMAC on the progress of developing more efficient and environmentally acceptable waste disposal procedures at the Abrolhos. (AILMSC)

## **Airstrips on the Abrolhos Islands**

*Immediate*

13. Review the Abrolhos Air Service to examine: service requirements; administrative arrangements; contractual arrangement; tendering processes and liability issues. (FWA)

14. Upgrade the Abrolhos airstrips and develop associated facilities, such as a waiting area for passengers, toilet facilities, telephone service, etc, in a manner consistent with the environmental values of the islands and the outcome of the Abrolhos Islands Air Service Review. (FWA)

*Ongoing*

15. Ensure that the airstrips in the Abrolhos are maintained at a safe and serviceable level. (FWA)

## **Geology and Geomorphology**

*Immediate*

16. Develop an inventory of the geological and geomorphological features of the Abrolhos System and prioritise areas for protection. (FWA, WAM, CURTIN UNIVERSITY, UWA)

17. Incorporate information about the need to protect fossil sites into the code of conduct for visitors to the Abrolhos. (FWA)

*Ongoing*

18. Ensure recreational and commercial activities are consistent with protection of the geological and geomorphological processes of the Abrolhos System. (FWA)

## **Marine Conservation**

*Immediate*

19. Declare the State Territorial Waters surrounding the Abrolhos Islands as a Fish Habitat Protection Area vested with the Minister for Fisheries under the *Fish Resources Management Act 1994*. (AIMAC, FWA)

*Ongoing*

20. Develop and implement a plan of management for the Abrolhos Island Fish Habitat Protection Area. (AIMAC, FWA)

21. Manage all activities to maintain and enhance intrinsic and ecological values of the Abrolhos. (FWA)

22. Undertake research to develop an understanding of the ecology of the aquatic ecosystem and develop criteria to monitor its health. (FWA)

23. Review and improve existing and proposed mechanisms for ensuring identification, protection and appropriate management of high conservation value marine areas and report on all options, including marine reserves and “no-take” areas. (AIMAC, FWA, CALM)

24. Maintain and develop the cooperative relationship between AIMAC, Fisheries WA and CALM to ensure that an integrated, efficient and effective approach to planning, management and tenure continues to be implemented and, where necessary, improved. (AIMAC, FWA, CALM)

### **Marine Flora and Fauna**

#### *Immediate*

25. Continue to develop the present habitat maps of the marine environment of the Abrolhos. (FWA)
26. Undertake surveys of the major marine habitats to determine the flora and fauna present and which species are potentially at risk. (FWA)

### **Reef Observation Areas**

#### *Immediate*

27. Continue the fin-fish monitoring program in the Reef Observation Areas (ROA) to determine stock levels and the effects of the ROA. (FWA)
28. Increase public information about the ROA. (FWA)
29. Review the boundaries of all four ROAs in the Abrolhos to accurately determine if they should be adjusted to provide better protection of the ecosystem. (FWA)

#### *Ongoing*

30. Retain existing regulations which protect the ROA, but increase surveillance and enforcement. (AIMAC, FWA)

### **The Establishment of Benthic Habitat Data**

#### *Ongoing*

31. Undertake broad-scale benthic surveys of Abrolhos reefs to determine reef health and quantify the effects of human impacts and any spatial and temporal changes to these reefs. (FWA)

### **Terrestrial Flora and Fauna**

#### *Immediate*

32. Develop a habitat map of the terrestrial environment of the Abrolhos. (FWA, CALM, WAM)
33. Undertake additional surveys of the major islands to determine which flora and fauna are present, and which species, if any, are at potential risk. (CALM, FWA, WAM)

#### *Ongoing*

34. Review the adequacy of existing and proposed mechanisms for ensuring identification, protection and appropriate management of high conservation value terrestrial areas and report on all management options. (AIMAC, FWA, CALM)
35. Advance the establishment of the most effective mechanism for ensuring identification, protection and appropriate management of high conservation value terrestrial areas and develop strategic management plans. (FWA, CLM)

## Introduced Flora and Fauna

### *Immediate*

36. Survey exotic species of plants and animals on the Abrolhos to establish the species present and develop a plan for their removal or management. (FWA, CALM)

### *Ongoing*

37. Prepare and implement a management plan for preventing the arrival of exotic species of flora and fauna, and managing or eradicating such species which may already be present. (FWA, CALM)

## Fire Management

38. Prepare and implement a fire management plan for the Abrolhos consistent with conservation of the environment whilst protecting property and developments. (FWA)

## Historic and Heritage Sites

### *Immediate*

39. Include information about the need to protect the sites in the code of conduct for visitors to the Abrolhos. (FWA)
40. Train fisheries officers in the management of historic sites and provide them with delegated powers as inspectors pursuant to the Historic Shipwrecks Act 1976. (WAM)

### *Ongoing*

41. Prepare and implement a management plan for the protection of historic shipwrecks, associated land sites and other sites of heritage value. (FWA, WAM).
42. Prepare and implement a public information program about the heritage sites and their history so that people may learn about and enjoy them, and assist in their protection. (FWA, WAM)

## Tourism

### *Immediate*

43. Develop a management plan for environmentally sensitive tourism at the Abrolhos, including policies and operating guidelines. (AIMAC)
44. Investigate the potential of marine and land-based tourism sites, assess environmental constraints, and develop rules and a code of practice for tourism development. (FWA)
45. Develop application guidelines and performance criteria for venture proponents, along with a procedure to aid assessment of a proponent's proposal and ability to perform. (AIMAC)

### *Ongoing*

46. Manage environmentally sensitive tourism in the Abrolhos through the development of appropriate management methods. (AIMAC)

## Recreational Fishing and Collecting

### *Immediate*

47. Continue research into the abundance of target species and catch levels in the Abrolhos. (FWA)
48. Review recreational fishing regulations for the Abrolhos Islands. (FWA)

49. Consider the reduction of daily bag limits for Prize Fish and Reef Fish as part of the review of recreational fishing regulations . (FWA)
50. Commercial rock lobster fishers taking fish recreationally for their own use should be subject to the same regulations as recreational fishers during the Abrolhos rock lobster season, within the State Territorial Waters. (FWA)
51. Recreational fishers should be required to label their Abrolhos catch as their own. (FWA)
52. Prohibit spear fishing with the use of compressed air at the Abrolhos Islands. Retain the prohibition of spear fishing in Reef Observation Areas. (FWA)
53. Retain existing regulations protecting samson fish and yellow tail kingfish in anchorage areas. (FWA)
54. Negotiate with the Recreational Fishing Advisory Committee and RECFISHWEST with respect to prohibiting the collection of corals, aquarium fish and shells. (FWA)
55. Investigate mechanisms to monitor the success of the above strategies and any impediments to their enforcement. (FWA)

### *Ongoing*

56. Apply the *Fish Resources Management Act 1994* regulations relating to the taking of fish in the Abrolhos. (FWA)
57. Modify the regulations relating to the taking of fish in the Abrolhos from time to time, if information available to Fisheries WA demonstrates more stringent ones are required. (FWA)

## **Diving**

### *Immediate*

58. Identify sites, in consultation with the community, which are suitable for the development of dive trails and establish a priority order for their development. (FWA)
59. Develop a code of conduct for dive charter operators. (FWA)

### *Ongoing*

60. Prepare information for the public about dive sites in the Abrolhos in consultation with diving clubs. (FWA)
61. Incorporate recommendations on diving in the code of conduct for the Abrolhos. (FWA)
62. Monitor intensity of diving in the Abrolhos, and any effects divers may be having on the environment. (FWA, dive clubs)

## **Surface Water Activities**

### *Ongoing*

63. Provide information to visitors on the various surface water activities available in the Abrolhos. (FWA)
64. Incorporate recommendations on surface water activities in the code of conduct for the Abrolhos. (FWA)
65. Monitor intensity of participation levels in surface water activities in the Abrolhos, and the effects these may be having on the environment. (FWA)
66. Exclude the use of personal powered watercraft except in designated areas. (FWA, DOT)

## Yacht and Power Boat Visits

### *Ongoing*

- 67. Provide information to visitors in yachts and power boats on conditions in the Abrolhos. (FWA)
- 68. Incorporate recommendations on yacht and power boat visits in the code of conduct for the Abrolhos. (FWA)
- 69. Monitor yacht and power boat visits to the Abrolhos, and the effects these may have on the environment. (FWA)

## Commercial Fishing

### *Immediate*

- 70. Survey waters to determine appropriate areas for scallop trawling. Exclude scallop trawling from all areas, except those with sandy or muddy sediments. (FWA)
- 71. Permit scallop trawlers to travel through closed areas to trawl within the waters of the Abrolhos, with nets hauled into their rigging and otter boards and stabilisers at the end of their booms. (FWA)
- 72. Initiate a study into the possible effects of the Mid-West WA Coast Purse Seine Fishery on seabirds nesting at the Abrolhos. (FWA)
- 73. Negotiate with licensed operators to prohibit commercial wetline fishing within marine habitats bordered by West Reef and eastern island chains or margins of the Abrolhos Groups, including the shallows surrounding North Island (see Figures 7a, 7b and 7c in this document). The depth of water in these areas is generally ten metres or less. This management measure will be in place for the duration of this plan. (FWA)
- 74. Negotiate with licensed operators and prohibit commercial shell collecting, coral collecting and beche-de-mer fishing in the waters. (FWA)
- 75. Undertake surveys of all marine habitats to determine the environmental impact of fishing and boating operations, and prepare strategies to manage unacceptable impacts. (FWA)
- 76. Non-endemic species to the Abrolhos Islands will not be considered for aquaculture purposes. (FWA)
- 77. Aquaculture proposals that require the input of food will not be considered until a high level of environmental review is undertaken to investigate the potential effects of localised nutrient dispersal. (FWA)
- 78. Aquaculture proposals for endemic filter feeders will require an environmental review prior to establishment. (FWA)
- 79. Identify suitable areas within each Abrolhos Islands Group where filter feeding aquaculture projects may be established. (FWA)
- 80. Develop an aquaculture plan for the Abrolhos Islands. (FWA)

### *Ongoing*

- 81. Limit commercial fishing in the Abrolhos System to a small number of high value fisheries, namely western rock lobster, scallops, fin-fish and aquaculture. (FWA)
- 82. Commercial fisheries are managed to ensure sustainable yields throughout the State. Fisheries in the Abrolhos will continue to be managed in accordance with Fishery Management Plans for the target species. (FWA)
- 83. Specific management approaches will be applied to fisheries operating in the Abrolhos, as appropriate. (FWA)

## **Mining and Petroleum Exploration**

### *Ongoing*

84. Liaise closely with the EPA and DOME about exploration or development proposals for the area, and contribute to the assessment process. (FWA).
85. Ensure the public is fully informed about all proposals. (EPA, DOME, FWA)

## **Other Extractive Industries**

### *Ongoing*

86. Monitor proposals to develop extractive industries in the Abrolhos System, and ensure all proposals are carefully assessed by the EPA. (FWA)

## **Structures**

### *Immediate*

87. Prepare policies, standards and guidelines for all new structures, which meet acceptable standards and avoid environmental loss. (AIMAC, FWA)
88. Prepare lease agreements for all structures. (AIMAC, FWA)

### *Ongoing*

89. Enforce existing regulations to ensure minimum standards are maintained. (FWA)

## **Moorings and Jetties**

### *Immediate*

90. Develop a mooring register and investigate the question of the appropriate location and operation of public moorings in the Abrolhos. (FWA, DOT)
91. Develop criteria for the development and operation of public jetties. (FWA, DOT)
92. Identify sites for the development of public moorings and jetties in consultation with user groups and seek funding for their development. (AIMAC, FWA)
93. Inspect and maintain all public moorings and jetties that are developed, to ensure they remain safe for public use. (FWA).

## **Navigational Aids**

### *Immediate*

94. Determine what navigational aids are necessary in the Abrolhos, where they should be located, and install appropriate aids. (FWA, DOT)

## **Information, Interpretation and Public Involvement**

### *Immediate*

95. Develop mechanisms for the exchange of information and ideas between stakeholders. (FWA)
96. Foster the development of acceptable codes of behaviour and develop an information package for distribution to all user and interest groups. (FWA)
97. Develop processes that encourage all stakeholders to participate in management activities for the area. (FWA)

*Ongoing*

98. Implement the communication plan for the Abrolhos in cooperation with other agencies, community groups and interested individuals. (FWA)

**Knowledge***Immediate*

99. Collect and catalogue research undertaken in the Abrolhos marine environment and determine priorities for management-oriented research in the short, medium and long terms. (AIMAC)
100. Develop mechanisms for encouraging research by outside bodies and individual researchers. (AIMAC)
101. Promote management-oriented research into the natural values of Abrolhos waters. (AIMAC)
102. Monitor the effects of increased usage of the islands to provide information which can be used to evaluate and improve management strategies. (FWA, CALM, WAM)
103. Develop mechanisms which make all research findings readily available to the community. (AIMAC, FWA)

*Ongoing*

104. Encourage management-oriented research on the marine environment of the Abrolhos Islands, including the waters around both inhabited and uninhabited islands. (AIMAC)

**Restricted Access to Large Ocean-Going Vessels***Ongoing*

105. Recommend to the Australian Maritime Safety Authority (AMSA) that it investigates the process of a Particularly Sensitive Sea Area (PSSA) declaration for an area around the Abrolhos Islands. (AIMAC, FWA)

**Community Liaison***Ongoing*

106. Communicate with, and seek advice regularly from the Abrolhos community, fishing industry, tourist operators and other interested parties to keep everyone informed of management practices and developments on the Abrolhos. (AIMAC, FWA, CALM)

**Resourcing, Surveillance and Enforcement***Immediate*

107. Provide information to visitors on the values of the marine habitats of the Abrolhos Islands, their wise use and applicable regulations. (AIMAC, FWA)
108. Ensure government officers have appropriate authority to undertake enforcement activities. (FWA, CALM, WAM, DOT)
109. Facilitate reciprocal functions by officers of different government departments through the provision of appropriate training. (FWA, CALM, WAM, DOT)
110. Establish a Volunteer Fisheries Liaison Officer program. (AIMAC, AILMSC, FWA)

*Ongoing*

111. Review options and seek resources for implementing the management plan, including appropriate external sources and licence fees. (AIMAC, FWA)

112. Ensure surveillance activities are coordinated between Fisheries WA, WAM, CALM and other government agencies. (FWA, WAM, CALM)

### **Safety**

#### *Ongoing*

113. Provide information to the public on safety while on the islands. (AIMAC, FWA, DOT)
114. Assist the Police and Department of Transport in search and rescue operations on the islands. (FWA)
115. Abide by the Occupational Health, Safety and Welfare regulations while operating at the Abrolhos Islands. (FWA)

### **Plan Implementation and Review**

#### *Immediate*

116. Prepare an implementation plan, taking account of priorities established in the management plan. (AIMAC, FWA)

#### *Ongoing*

117. Actively seek resources to implement this plan. (AIMAC, FWA)
118. Annually review the plan implementation and prepare a report on progress, and adjust management accordingly. (AIMAC, FWA)



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## Section I      The Environment of the Houtman Abrolhos

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The Houtman Abrolhos Islands (“the Abrolhos System”) is one of the most interesting parts of Western Australia. The Abrolhos is a complex of low-lying islands and reefs located at the edge of the continental shelf between 28° 15’ S and 29° 00’ S, at a distance of approximately 60km offshore from Geraldton on the mid-west coast of the State.

There are three major groups of islands: North Island - Wallabi Group; Easter Group; and Pelsaert (or Southern) Group, separated by the Middle and Zeewijk Channels which are each approximately 40m deep (Figure 1).

The islands are geomorphologically diverse, with some major islands (North, East and West Wallabi) being of ‘continental origin’ (i.e., they were joined to the mainland) over 7,000 years ago. Other islands were formed more recently by the erosion and deposition of sediments during the rise and fall of sea levels, and by cyclical storms, waves, winds and swell.

Important geological features include pavement limestone, sand dunes and consolidated dunes on North, East and West Wallabi islands which are unusual, easily-disturbed structures that have a slow rate of regeneration. Internationally significant fossil sites occur in the Wallabi group. Small tidal ponds in the Abrolhos System are important structures, which are rare on offshore islands in south-western Australia.

The terrestrial flora and fauna of the Abrolhos has persisted since the larger islands were joined to the mainland. They provide important reference areas on ecological interactions.

The flora of the Abrolhos includes a number of communities which are of special conservation interest, including mangroves (represented by the single species *Avicennia marina*), *Atriplex cinerea* dwarf shrubland, and saltbush flats.

Most of the Abrolhos Islands have bird nesting and breeding areas, and populations of some species of seabirds are of international significance. Other important fauna include the tammar wallaby (*Macropus eugenii*), abrolhos painted-button quail (*Turnix varia scintillans*), brush bronzewing (*Phaps elegans*), abrolhos dwarf bearded dragon (*Pogona minor minima*), and abrolhos spiny-tailed skink (*Egernia stokesii stokesii*).

The waters of the Abrolhos Islands are of recognised conservation significance. In 1994 the Marine Parks and Reserves Selection Working Group acknowledged the islands as the most significant area on the Western Australian coast, and the most worthy of reservation.

The Abrolhos coral reefs are the southernmost living reefs in the Indian Ocean. They are bathed by the warm waters of the Leeuwin Current (Pearce & Walker 1991; Pearce 1997), and have a unique assemblage of tropical species of fish, reef corals, and other invertebrates which live in close association with temperate species of algae and species endemic to WA. The Abrolhos System is an important component of the fishery for the commercially valuable western rock lobster (*Panulirus cygnus*), a species endemic to WA.

Associated with the corals in the Abrolhos are many tropical species of molluscs, crustaceans, worms and other animals. The diversity and abundance of corals and other biota make the Abrolhos one of the best areas for diving in the State.

The coral reefs occur in the same area as lush growths of temperate marine algae, more characteristic of the south coast of WA. In some places, the corals and algae live amongst each other.

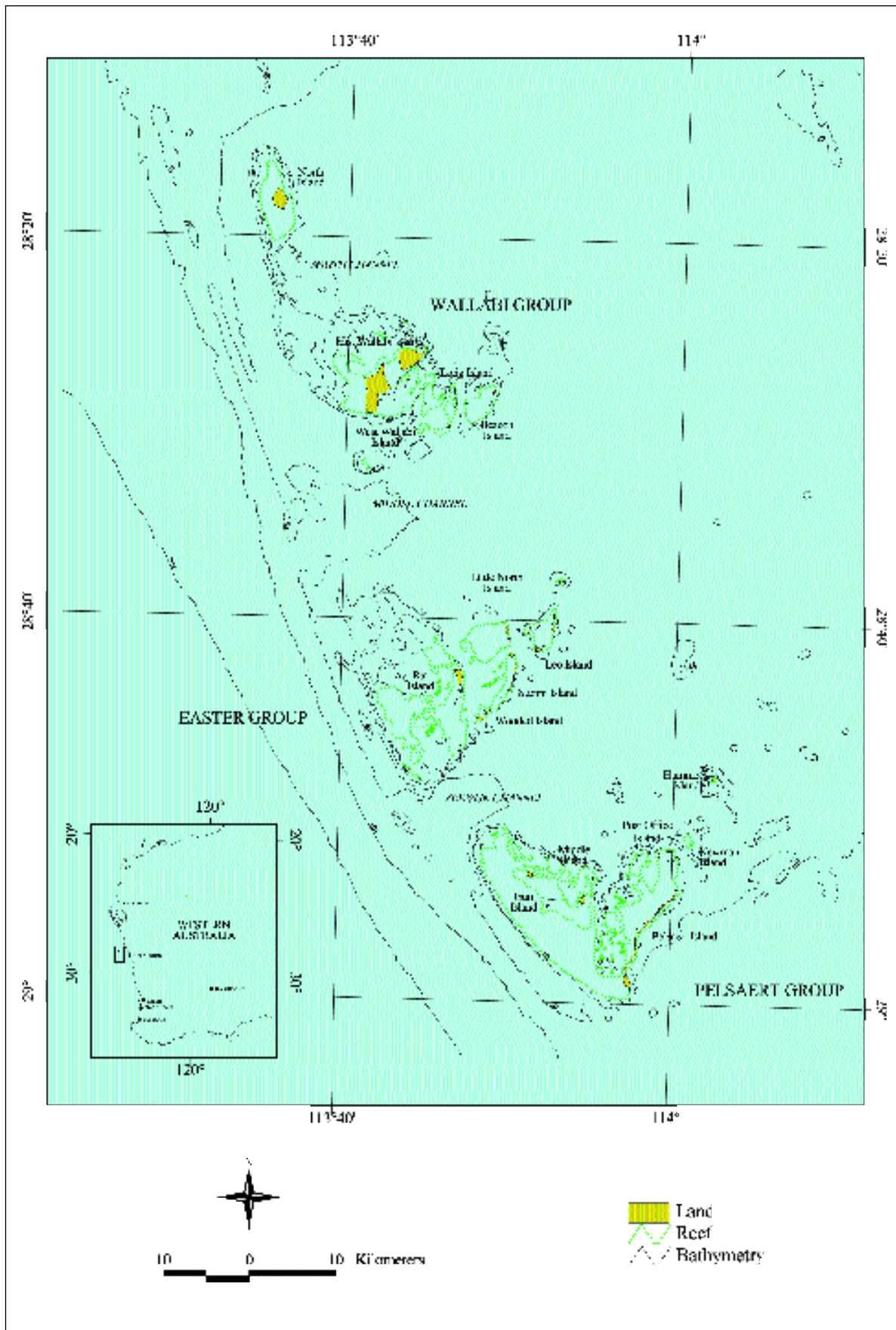


Figure 1: Map of Houtman Abrolhos.



Superimposed on the tropical/temperate species overlap is a group of species endemic to WA, which occur along the coastline of the State but nowhere else in the world. Many of these endemic species are commercially (western rock lobster, baldchin groper) or ecologically (the snail *Tectus pyramis*) important. The mixture of tropical, temperate and WA endemic species makes the Abrolhos unique.

The islands are also extremely important in Australian maritime history. The Dutch East Indiaman *Batavia* was wrecked off Beacon Island in the Wallabi Group in 1629. The survivors established what was essentially the first European settlement in Australia and lived there for six months before being rescued and taken to Batavia (now Jakarta).

The horrors which occurred on Beacon Island have etched the Abrolhos into Australian history books forever. Nearly a century later the *Zeewijk* was wrecked off Gun Island in the Pelsaert Group in 1727. Again, the survivors eventually made their way to Batavia after building a boat from the wreckage of their vessel.

This combination of features makes the Abrolhos a unique area of WA, one well worth conserving for future generations of Western Australians.

### 1.1 Values

The Abrolhos Islands have long been recognised as being of high value to the people of WA. These values include:

#### Conservation Values

- The islands have seabird populations of international significance.
- The flora and fauna is significant, with two sub-species of reptiles and two sub-species of birds being endemic to the islands.
- The State Territorial Waters of the Abrolhos have a unique combination of tropical, temperate and WA endemic marine species.
- Tropical corals mix with temperate algae in these waters.
- The coral reefs of the Abrolhos are the southernmost in the Indian Ocean.
- The diversity of the marine communities.
- Three species of Declared Rare Fauna occur on the Abrolhos: tammar wallaby (*Macropus eugenii*); abrolhos painted-button quail (*Turnix varia scintillans*); and lesser noddy (*Anous tenuirostris melanops*).
- Three species of priority fauna occur on or around the Abrolhos Islands: brush bronzewing (*Phaps elegans*); abrolhos dwarf bearded dragon (*Pogona minor minima*); and houtman abrolhos spiny-tailed skink (*Egernia stokesii stokesii*).

#### Cultural Values

- The Abrolhos are the site of two Dutch shipwrecks, which have important associated historic sites on the islands themselves.
- The Abrolhos are the site of a number of more recent wrecks.
- The remains on the Abrolhos of a long-dead guano industry provide insights into the history of WA.
- Early shacks built by fishers on the islands demonstrate the living conditions of their era.

### Recreational Values

- The Abrolhos Islands are an area suitable for nature-based tourism, including bird watching and walking.
- The Abrolhos are an excellent area for fishing, diving, boating and surface water activities.

### Educational and Scientific Values

- The unique assemblage of marine flora and fauna has attracted considerable continuing scientific research.
- The presence of historical wreck sites provides insights into Australia's maritime history.
- There are land sites associated with historical shipwrecks of international significance.
- The protected waters within the Abrolhos offer outstanding opportunities for undertaking educational tours.
- The outstanding bird life has attracted considerable continuing scientific research.
- There are rare and endangered species of fauna on the islands.
- The isolation of the islands' plant and animal populations from those of mainland WA provides opportunities for ecological studies.
- The islands provide substantial opportunities for educational field studies.

### Commercial values

- The Abrolhos System provides the basis of a number of important commercial fishing industries.
- Charter boats actively take tour groups to the Abrolhos.
- There is potential for development of nature-based tourism in the islands.
- The Abrolhos is one of the main fishing areas of WA. Western rock lobster is the primary species pursued, but scallops and fin-fish are also targeted.
- There is potential for aquaculture development in the area.

### Social Values

- The Abrolhos Islands have been inhabited by fishermen for over 90 years. In many instances, today's fishermen are fourth generation residents of the Abrolhos.
- The Abrolhos Islands rock lobster fishermen - many having spent part of every year of their lives growing up and working there - care for the islands and their flora and fauna, and possess considerable knowledge of them.
- The settlements throughout the Abrolhos are unique to WA and provide an insight into past and present commercial fishing operations and lifestyle.
- The Abrolhos Islands have been the destination for many seasoned recreational fishers, divers and visitors, who have a similar affinity for the area as the rock lobster fishermen.

## 1.2 Public Consultation

During the preparation of this report, AIMAC engaged independent consultants, Colleen Henry of the Department of Commerce and Trade and Rebecca Ruiz-Avila of Biospherics Pty Ltd, to consult with the public.

They met with a wide range of people and interest groups and produced a report, *Public Involvement and the Abrolhos Islands Draft Management Plan*. Their report deals with a range of issues including:

- Fishing and aquaculture;
- Tourism and recreation;
- Environmental and cultural issues;
- Facilities and development;
- Information interpretation and education;
- Research and monitoring; and
- Other management issues.

The public submissions have been considered during preparation of the report and assisted in its development. They demonstrate a strong public interest in the Abrolhos System, and a strong public desire for involvement in the decision-making process and management of the area.

### Public Consultation and Impact

During the public consultation process, community groups and individuals highlighted a number of matters which have been considered in the preparation of the management goal, primary objectives and strategies.

These issues include:

- the need for a “whole-of-ecosystem” approach to management;
- the need to protect biological diversity;
- the need for public consultation and involvement in planning and management processes;
- the requirement for more information about the future management of the Fish Habitat Protection Area;
- the possibility of having “no-take” zones or marine reserves, particularly in sensitive areas, and provision of monitoring sites;
- the possibility of vesting the FHPA in a community body;
- the need to review the boundaries of the Reef Observation Areas, monitor their effectiveness and strictly enforce the regulations which protect them;
- the loss of habitat values near inhabited islands due to natural events and human activities; and
- threats from mining, oil exploration and development, shipping and pollution.

### **1.3 Management Plan for the Marine and Terrestrial Areas of the Houtman Abrolhos Islands**

The Abrolhos Islands Management Advisory Committee (AIMAC) was established in 1996 under the terms of the *Fish Resources Management Act 1994*. The first priority of AIMAC has been the development of management plans for the Abrolhos.

In preparing the plans, the AIMAC has worked closely with Fisheries WA, Department of Conservation and Land Management, Western Australian Museum, other governmental agencies, and the public. AIMAC has also carefully considered previous reports on the Abrolhos and submissions made to them. The management plans will be effective for a duration of five years from the date of its gazettal.

## Section 2 Management of the Environment of the Abrolhos Islands

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### Goal

*To provide a sound mechanism for conserving the environment of the Abrolhos Islands for present and future generations, as a single viable ecosystem, by protecting natural diversity, cultural heritage and ensuring ecologically sustainable use.*

### 2.1 Primary objectives

To achieve the goal of the plan, a number of primary objectives have been developed. These are:

**Conservation** To conserve the ecosystem and cultural heritage values.

**Management** To determine and implement appropriate management processes to facilitate planning, control (licensing, enforcement), dispute resolution, consultation, information flow and resource funding and allocation, which takes into account legislation and statutory arrangements.

**Research and Monitoring** To gain and disseminate the knowledge required to understand and manage the Abrolhos.

**Community Awareness and Involvement** To raise awareness, appreciation and understanding of the unique values of the Abrolhos, and involve the community in the processes required to plan for and manage the area.

**Use and Development** To enable multiple, equitable and sustainable use and development of the historical, social and economic attributes of the Abrolhos.

**Legislation** To create the legislative framework sufficient to manage and protect the area.

**Implementation and Resources** To provide a program for resourcing and implementation of the management plan.

### 2.2 Purpose, Vesting and Tenure

#### 2.2.1 Present and Proposed Status and Vesting

The Abrolhos Islands are currently the Houtman Abrolhos Islands Reserve No. A20253, vested under the *Land Act 1933 (WA)* with the Minister for Fisheries for conservation of flora and fauna, tourism and for purposes associated with fishing industry.

The islands are surrounded by State Territorial Waters for a distance of three nautical miles from established baselines (as shown on Figure 2). These waters are part of a special declared fishing area for rock lobsters (Zone A) pursuant to the *Fish Resources Management Act 1994*.

The State Territorial Waters are not currently vested. Under the proposed management plan, the State Territorial Waters surrounding the Abrolhos will be gazetted as a Fish Habitat Protection Area and vested with the Minister for Fisheries under the *Fish Resources Management Act 1994*. The mechanisms for this are addressed in Schedule 1.

There are two declared shipwrecks in the Abrolhos System under the *Maritime Archaeology Act 1973 (WA)* and the *Historic Shipwrecks Act 1976*. These are at Morning Reef in the Wallabi Group and Half Moon Reef in the Southern Group.

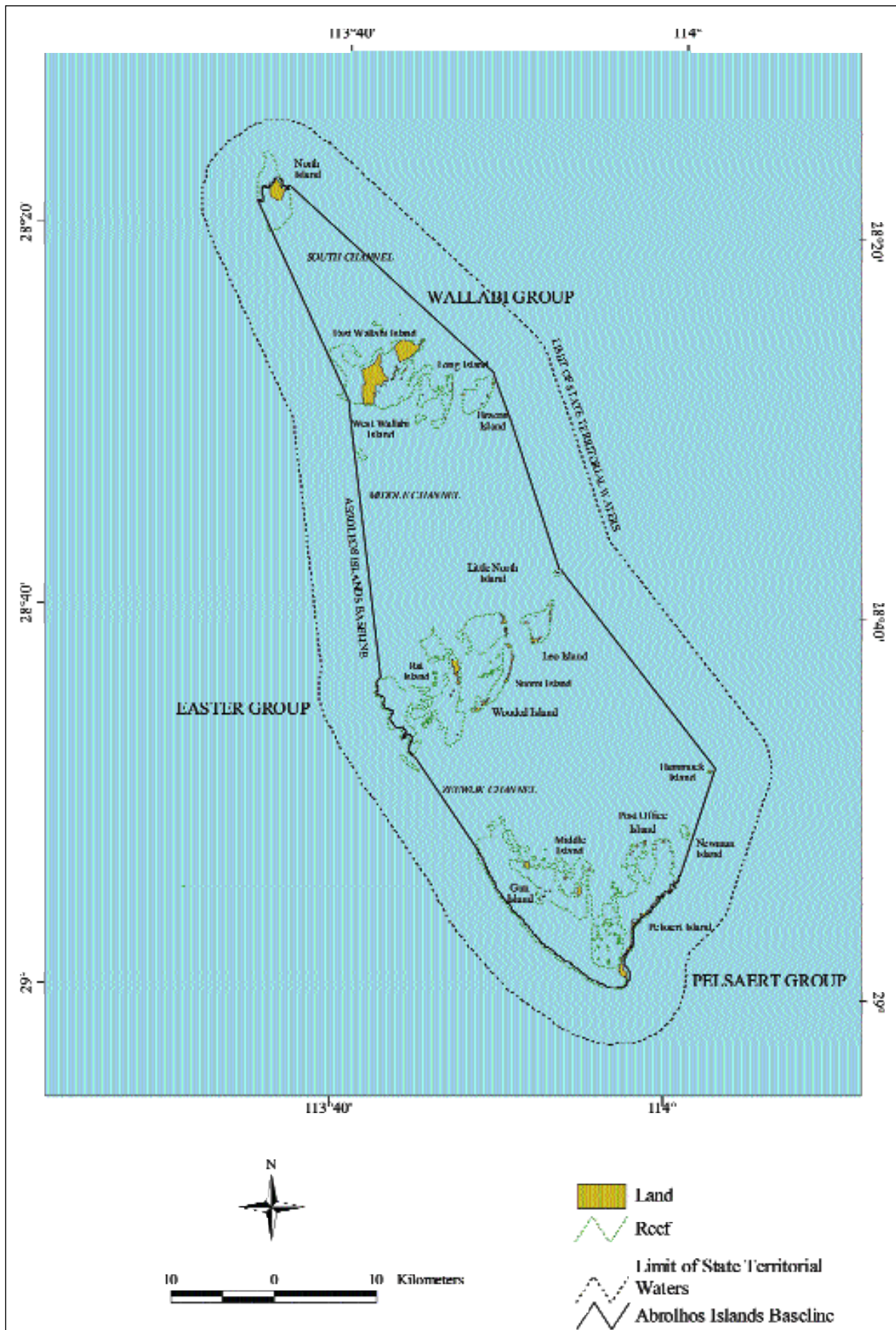


Figure 2: Houtman Arolhos: Proposed Fish Habitat Protection Area.

Currently there are no mining or oil exploration leases covering the area. However, there are several environmentally significant areas pertaining to oil spills (as shown on Figure 3).

Specific areas, one in each island group, were gazetted as Reef Observation Areas (ROA) and established pursuant to Sections 9,10 and 11 of the *Fisheries Act 1905 (WA)* on 20 May 1994 (see Figures 4a, 4b, and 4c). Catching of fish by line, spear or any other method is banned in the ROAs, but commercial and recreational rock lobster potting may be undertaken. The ROAs are extensively used by visitors.

The establishment of a national park over the non-fishing islands and parts of fishing islands has been proposed on a number of occasions as a necessary strategic step and is referred to in Section 6.9 of this document.

### **2.2.2 Report and Recommendations of the former Abrolhos Islands Consultative Council**

The Abrolhos Islands Planning Strategy Final Report released in January 1989 stated “future administration of the Abrolhos Islands should reflect the multiplicity of uses of the islands, the nature of the resource and its management requirements.” Its role should include:

- i) Coordination and development of strategic policy requirements.
- ii) Establishing an advisory body to government on relevant issues.

The primary objective of the Abrolhos Islands Planning Strategy was:

- To conserve and protect the natural and cultural values of the islands and surrounding waters, whilst providing for appropriate levels of use and effective legislative controls of areas which contain features of exceptional natural significance.

To achieve this objective successfully required a management and administrative structure within which a management plan could be implemented. Previous studies on the Abrolhos were not implemented because of the lack of a framework which took into account the multiple uses of the islands and their surrounding waters, and the lack of commitment of resources.

The establishment of the Abrolhos Islands Consultative Council (AICC) in February 1990 provided the practical management and administrative framework to enable the State Government to effectively administer the Abrolhos Islands and their surrounding waters, and ensure ongoing consultation with community interests.

The AICC was operational for five years. When established, the Cabinet of the State Government directed that the AICC’s principal functions were to:

- provide advice to the operating agencies under an arrangement worked out between the AICC and the agencies;
- organise community groups, as required, to provide a greater span of advice on specific issues; and
- provide advice to the operating agencies on priority projects.

The AICC recommended in the *Abrolhos Islands Aquatic Reserve Final Report* that the State Territorial Waters of the Abrolhos Islands be gazetted as an Aquatic Reserve under the *Fisheries Act 1905*, but subsequent legal advice determined that this was not possible. The *Fisheries Act 1905* has now been rewritten as the *Fish Resources Management Act 1994* and provision made for the establishment of Fish Habitat Protection Areas. The AICC ceased to exist on 31 December 1995.

# Management of the Environment of the Abrolhos Islands

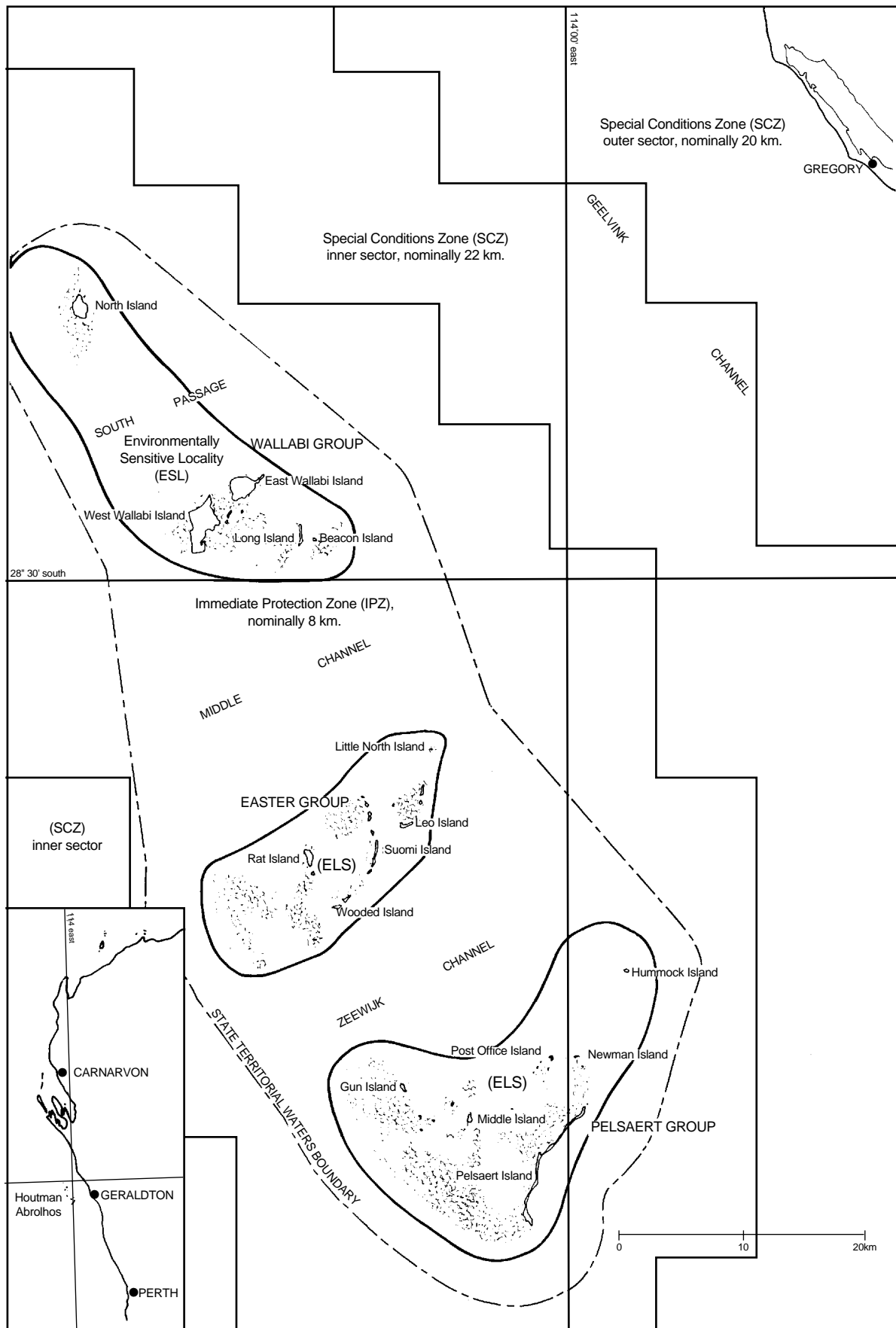


Figure 3: Environmental Significant Areas Pertaining to Oil Spills.



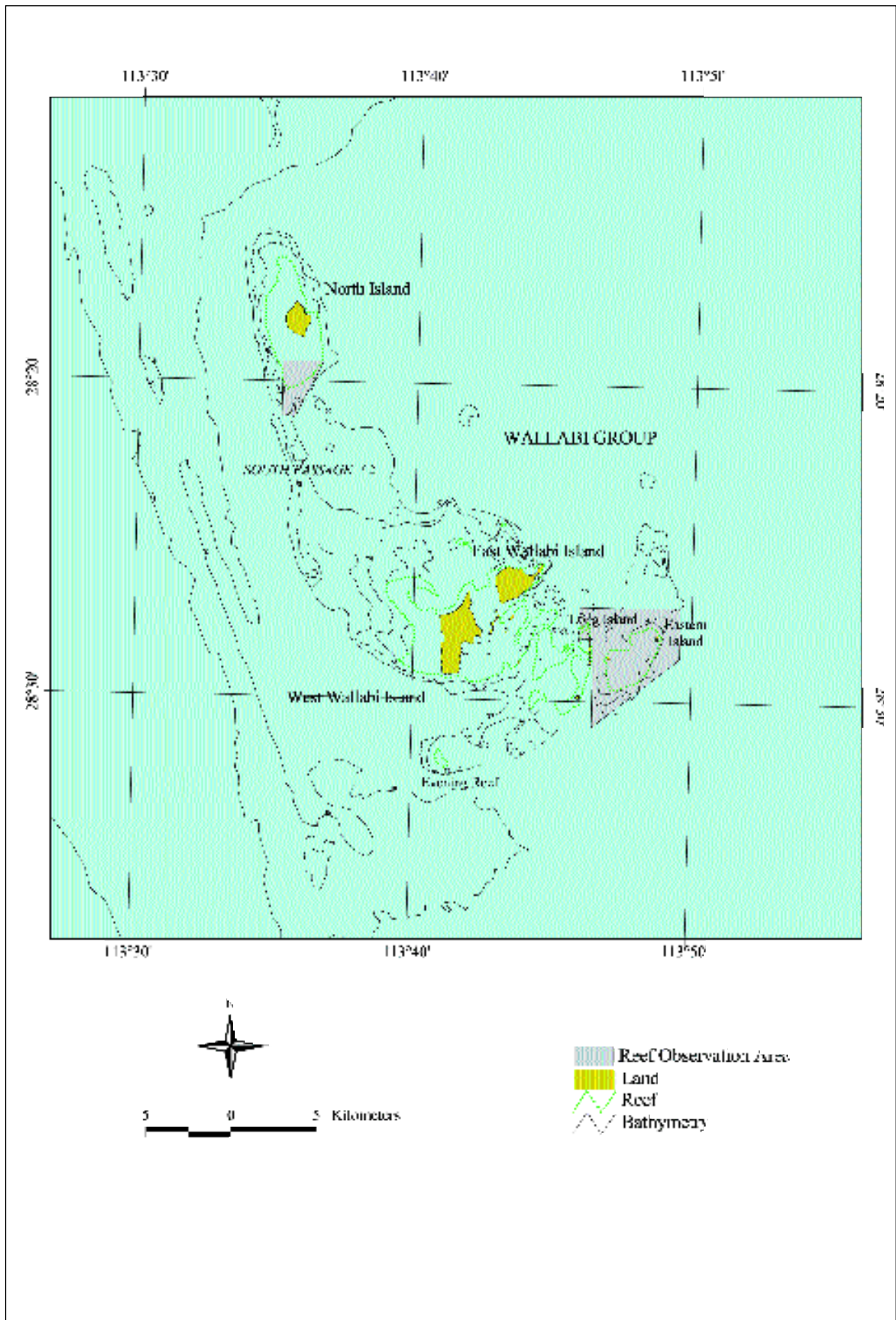


Figure 4a: North Island and Beacon Island Reef Observation Areas.

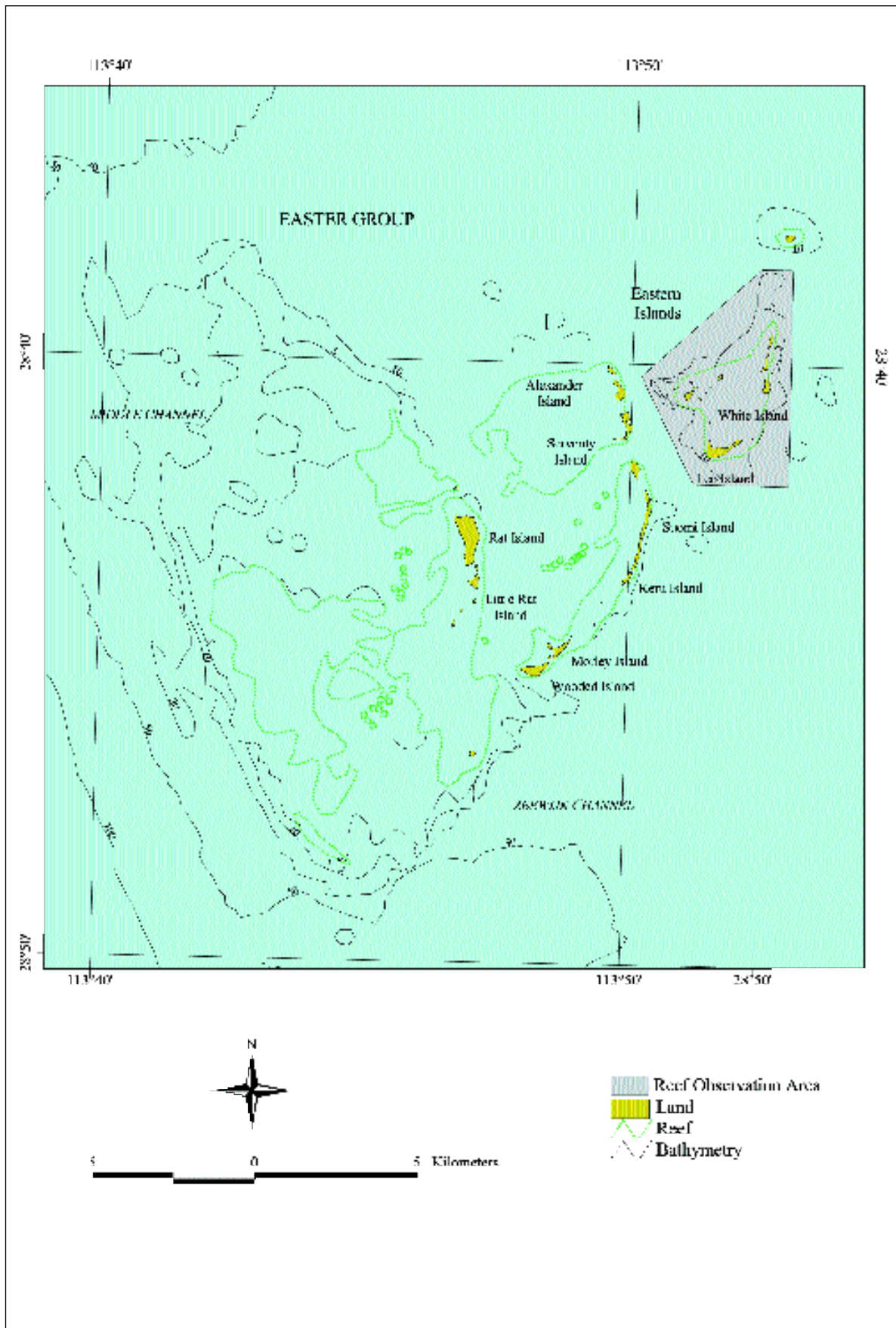


Figure 4b: Leo's Island Reef Observation Areas.

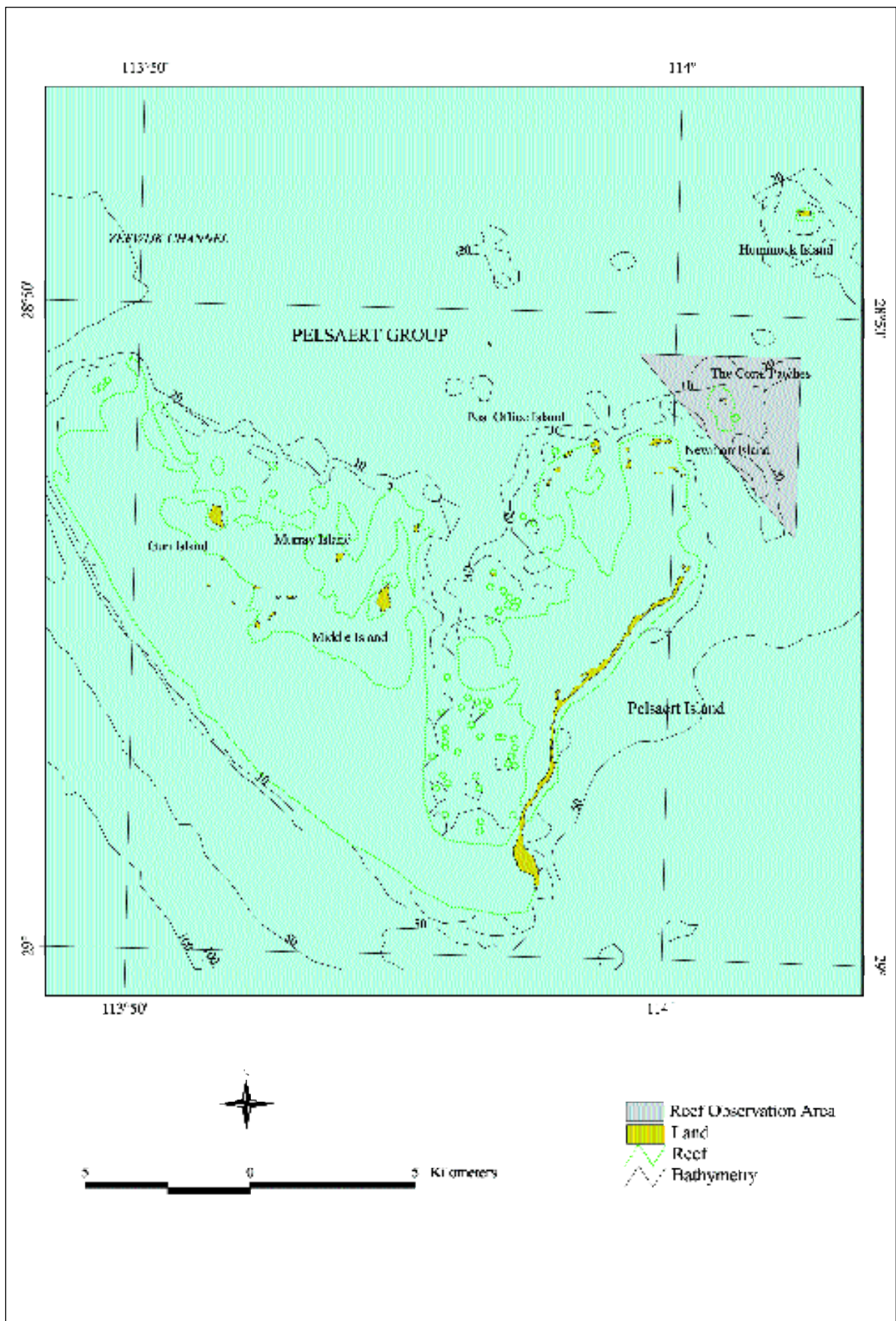


Figure 4c: The Coral Patches Reef Observation Area.

### 2.2.3 Present Management Regimes

#### 2.2.3.1 Abrolhos Islands Management Advisory Committee (AIMAC)

Section 42 of the *Fish Resources Management Act 1994* provides that the Minister for Fisheries may establish Advisory Committees to provide information and advice to the Minister on matters related to the administration for the Act; and provides that the instrument establishing such Advisory Committees shall specify the functions, identify the Members of the Committees and may provide for any other matters that in the Minister's opinion are necessary for the operation of the Advisory Committees.

In April 1996 the Minister for Fisheries established the Abrolhos Islands Management Advisory Committee (AIMAC). The functions of AIMAC are to provide information and advice to the Minister about:

- (a) the management of all fish and fisheries within the Abrolhos Islands (being the subject of Reserve No. A20253) together with the territorial waters around those islands ("the Abrolhos Islands Area") which are not managed in accordance with a management plan made under the Act, with a view to the proper conservation and management of those fish and fisheries;
- (b) the management of the Abrolhos Islands Area for those activities related to fishing, conservation and nature-based tourism, including the need for sanctuary areas, the protection of coral and similar organisms, and the use of the Abrolhos Islands Area by the public;
- (c) appropriate development of, and access to, the Abrolhos Islands Area, including proposals for tourist development, the construction and use of airports, tracks, fences, signs, jetties, moorings and airstrips;
- (d) the impact on the Abrolhos Islands Area of proposed aquaculture developments;
- (e) in relation to any plan (or draft plan) of management for the Abrolhos Islands Area;
- (f) how to promote public understanding, knowledge and appreciation of the natural and cultural resources of the Abrolhos Islands Area, and the conservation of the natural and cultural values of the Abrolhos Islands Area;
- (g) a consultative process which ensures the community, State and local government agencies and tertiary institutions have an ongoing involvement in the planning for, and management of, the Abrolhos Islands Area; and
- (h) a consultative process with other advisory bodies concerned with fishing and other relevant activities within the Abrolhos Islands Area, including the Rock Lobster Industry Advisory Committee, Western Australian Fishing Industry Council, Recreational Fishing Advisory Committee, and the Recreation and Sports Fishing Council (now superseded by RECFISHWEST).

The membership of AIMAC is a blend of tourism and commercial fishing industry representatives, user groups and planning and business expertise, so as to reflect the large variety of people with an interest in the Abrolhos Islands. Representatives of Fisheries WA, the Western Australian Museum and the Department of Conservation and Land Management sit on AIMAC in an *ex-officio* capacity.

A second body, the Abrolhos Islands Land Management Sub-committee (AILMSC) has been established by AIMAC to advise on the management of fisher-inhabited islands. The working of this committee is discussed in Section 4.3.1.

## Section 3 Legislative and Administrative Frameworks

---

### 3.1 Fisheries Western Australia

Fisheries WA is responsible for the management of commercial and recreational fishing, and aquaculture in the waters that extend to the 200 nautical mile (370km) outer limit of the Australian Fishing Zone.

The relevant objects of Section 3 of the *Fish Resources Management Act 1994* include:

- (a) to conserve fish and protect their environment;
- (b) to enable the management of fish habitat protection areas and manage the Abrolhos Islands reserve.

Further, under Part 11 of the *Fish Resources Management Act 1994* Fisheries WA may regulate to manage the Abrolhos Islands.

Fisheries WA is subject to the direction and control of the Minister for Fisheries and administered by an Executive Director. It operates under the *Fish Resources Management Act 1994*.

Fisheries Western Australia's mission statement is:

*Partnered by fishers, aquaculturists and the wider community, we will conserve, develop, and share the fish and other living aquatic resources of Western Australia for the benefit of present and future generations.*

The location, distance offshore and lack of water and basic facilities at the Abrolhos make the logistics of operating in any capacity extremely difficult and expensive both for State Government agencies and the private sector.

Fisheries WA is the principal operating agency at the Abrolhos Islands. It operates in the Abrolhos throughout the year, with a concerted presence and management role during the annual Abrolhos rock lobster season (15 March - 30 June).

Fisheries WA resources currently available for management of the Abrolhos include:

- a 20m patrol vessel;
- an 11m jet-boat;
- four camps (three for operations and one for research); and
- staff based in the Geraldton District office.

Numerous research programs (fisheries and environmental) are conducted at the Abrolhos by Fisheries WA, Department of Conservation and Land Management, tertiary institutions, the Western Australian Museum, and other State agencies. These projects are coordinated by Fisheries WA and the resultant data is invaluable for determining and modifying present management regimes.

### 3.1.1 Objects of the Fish Resources Management Act (1994)

The objects of the *Fish Resources Management Act 1994* are to conserve, develop and share the fish resources of the State for the benefit of present and future generations.

In particular, the *Fish Resources Management Act 1994* has the following objects:

- (a) to conserve fish and protect their environment;
- (b) to ensure that the exploitation of fish resources is carried out in a sustainable manner;
- (c) to enable the management of fishing, aquaculture and associated industries and aquatic ecotourism;
- (d) to foster the development of commercial and recreational fishing and aquaculture;
- (e) to achieve the optimum economic, social and other benefits from the use of fish resources;
- (f) to enable the allocation of fish resources between users of those resources;
- (g) to provide for the control of foreign interests in fishing, aquaculture and associated industries; and
- (h) to enable the management of fish habitat protection areas and the Abrolhos reserve.

## 3.2 Other Agencies and Relevant Acts

### Objective

*Integrate the management programs of Fisheries WA, and other agencies with management responsibilities in the Abrolhos.*

This section details other government agencies which have legislative responsibilities affecting the Abrolhos. A summary of these agencies and the scope of their responsibilities is set out below.

It is recognised that close consultation between all agencies with responsibilities in the Abrolhos is required in order to ensure effective and efficient management. This is particularly so because, notwithstanding the differing responsibilities, aims and objectives which each of these agencies brings to bear, there are obvious logistical difficulties in having access to and, where appropriate, managing or policing activities carried on at the Abrolhos.

Because of the distance of the Abrolhos from the mainland and the limited facilities and resources available there, it is disproportionately difficult and expensive for most agencies to incorporate the islands as part of their standard operational procedures. In many instances, Fisheries WA provides logistical support to enable effective implementation of the management responsibilities of other agencies.

1. The **Department of Conservation and Land Management (CALM)** was established under the *Conservation and Land Management Act 1984 (WA)*. CALM administers the *Wildlife Conservation Act and Regulations 1950 (WA)* which aims to conserve WA's native flora and fauna, and the recently established *Acts Amendment (Marine Reserves) Act 1997* which provides for the establishment and management of marine reserves. In the Abrolhos, CALM is responsible primarily for the native flora and fauna on the islands, including seabirds, marine mammals and reptiles.
2. The **Western Australian Museum (WAM)** has administrative responsibilities for the State's *Maritime Archaeology Act 1973* and the Commonwealth *Historic Shipwrecks Act 1976*. These Acts effectively combine to protect valuable State and Commonwealth maritime heritage sites, both above and below the water. The two Acts aim to preserve the integrity of Australian shipwrecks for the benefit of the community's present and future generations.

The WAM through the *Museum Act 1969 (WA)* has the task of documenting the fauna of Western Australia. The WAM's Museum of Natural Science has undertaken considerable work in documenting both the marine and terrestrial fauna of the Abrolhos.

4. The **Department of Transport (DOT)** through the administration of the *Marine Act 1982 (WA)* has responsibility for ensuring the safety of all vessels in the State Territorial Waters.
5. The **Environmental Protection Authority (EPA)** was established under the *Environmental Protection Act 1986 (WA)*. The Authority provides advice to the Minister for the Environment on issues relating to protection of the environment, assesses the environmental impact of development proposals and controls marine and terrestrial pollution. The Department of Environmental Protection (DEP) is the public sector agency which provides advice to the Authority.
6. The **Western Australian Department of Minerals and Energy (DOME)** through the *Petroleum Act 1967 (WA)* and the *Petroleum (Submerged Lands) Act 1982 (WA)* has the responsibility for overseeing the petroleum industry. DOME is the body which handles permit applications for oil and gas surveys on or adjacent to the Abrolhos. Any such surveys are subject to the terms and conditions established under the *Environmental Protection Act 1986 (WA)*.
7. The **Western Australian Police Service (WAPS)** is responsible for a number of Acts including the *Police Act 1892 (WA)*. The WAPS is the lead agency in emergency management procedures on the Abrolhos (e.g., the implementation of the Abrolhos Islands Tropical Cyclone Plan).

In addition, there are a number of pieces of State and Commonwealth legislation which affect the administration of the Abrolhos. These are:

8. The *Heritage Act 1990 (WA)*.
9. The *Protection of Movable Cultural Heritage Act 1986 (Cwlth)*.
10. The *Health Act 1911 (WA)*.
11. The *Land Act 1933 (WA)*.

## Strategies

### *Immediate*

1. *Develop Memoranda of Understanding between Fisheries WA and other relevant organisations which detail management arrangements and maximise governmental efficiency through coordination of responsibilities staff, equipment, vessels, and provision of information. (FWA)*

### *Ongoing*

2. *Continue to support and assist AIMAC in order to coordinate all agencies with legislative responsibilities, community groups and individuals to ensure management of the Abrolhos is integrated and in accord with appropriate legislation. (FWA)*

## 3.3 The Register of the National Estate

The Register of the National Estate is defined under the *Australian Heritage Commission Act 1975* as “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 the present community.”

The Abrolhos Islands, above low water mark, have been listed in the Register of the National Estate since 1978. As yet, the Australian Heritage Commission has had no involvement in actions on the islands. The marine area surrounding the Houtman Abrolhos Islands was gazetted as an interim listing in the Register on 24 June 1997.

The major purpose of the Register of the National Estate is to be an alerting device, so that places of heritage value are not inadvertently or unnecessarily destroyed or degraded. Listing in the Register does not restrict use of a site by land-owners or local and State governments, nor does it preclude fishing, tourism or mining activities.

The major consequence of listing is that the Commonwealth Government is required to refrain from actions which adversely affect listed sites if this is prudent and feasible and, if not, to take reasonable measures to minimise the adverse affects.

Once a place is listed in the Register, it can also be a focus for funding from other Commonwealth programs.

### **3.4 International Treaties**

Under Australia's obligations to international treaties and agreements, the following legislation needs to be recognised in the context of this plan:

- Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES);
- Convention on Wetlands of International Importance (Ramsar Convention);
- Agreement between the Government of Australia and the Government of Japan for the protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA);
- Convention of the Conservation of Migratory Species of Wild Animals (CMS or Bonn Convention);
- Australian/Netherlands Committee on Old Dutch Shipwrecks (ANCODS) Agreement; and
- Convention on Biological Diversity (Rio Convention).



## Section 4

## Inhabited Islands

### Objective

*Develop and implement the policies for a management structure required to effectively manage inhabited islands to enable their continued use while minimising the adverse effects of human activities on the environment.*

The Abrolhos Islands are one of the most important regions for the commercially valuable western rock lobster (*Panulirus cygnus*) fishery, with the Abrolhos component of the fishery producing on average 15% of the total catch, at a value of approximately \$45 million per year.

Licensed rock lobster fishermen with an A Zone endorsement for the Abrolhos Islands are allowed to establish permanent camps on the islands to assist them in fishing the adjoining waters. The camps are occupied during the Abrolhos season (15 March - 30 June), and can only be used outside the season for maintenance and repairs. 22 of the 122 islands in the Abrolhos have camps on them.

### 4.1 Building Standards

Early development of the camps occurred on an ad-hoc basis, without regard to overall planning and normal building standards. Consequently, some development was of a standard which would have been unacceptable elsewhere.

Any future development of camps or other developments will adhere to strict standards and existing sub-standard structures will be upgraded in accordance with a schedule agreed between Fisheries WA and the occupants.

In assessing development proposals, consideration will be given but not constrained to:

- the protection of public health and safety;
- the incorporation of innovative, effective and environmentally acceptable services and infrastructure;
- the achievement of aesthetic standards complementary to the existing landscape values and characteristics of the Abrolhos; and
- provision of a development in which its overall impact on the immediate and wider setting is minimised.

### Strategies

#### *Immediate*

**3. Prepare and implement building standards which meet Australian Standards Association specifications and are consistent with the values of the Abrolhos System for all developments. (AIMAC, FWA)**

### 4.2 Leases and Licences for Development Purposes

Due to the manner in which development has occurred at the Abrolhos, the occupancy of sites has not been formalised in accordance with properly constituted leases or licences. It is necessary to rectify this deficiency as a matter of priority.

A system of leases and licences is required to provide approved operators with an agreed level of security of tenure and enable the Minister for Fisheries to manage issues of liability, waste management and building standards.

### Strategies

#### *Immediate*

*4. Develop lease and licensing arrangements for all developments on the islands. These arrangements will cover jetties, camps and other buildings. (FWA, AIMAC, Crown Solicitor)*

### 4.3 Land-Use Planning

As previously mentioned, past development on the Abrolhos has occurred in an *ad-hoc* manner, resulting in some inefficient use of space and loss of amenity. There is need for a “land-use” plan for each developed site, to enable resolution of some of these issues.

Such plans would be developed by planning consultants, after consultation with Abrolhos residents and the wider community.

There is also a need for proper emergency planning to deal with natural disasters, including fires and cyclones (the Abrolhos Islands Tropical Cyclone Plan was prepared by the Western Australian State Emergency Service in February 1997).

#### 4.3.1 Abrolhos Islands Land Management Sub-committee (AILMSC)

The Abrolhos Islands Land Management Sub-committee (AILMSC) has been established by the Abrolhos Islands Management Advisory Committee (AIMAC) to advise it on the management of fisher-inhabited islands. The AILMSC is chaired by AIMAC and has a minimum of two elected representatives from each of the island groups and North Island. The AILMSC reports directly to AIMAC on issues before it for consideration. The sub-committee’s terms of reference are:

- To identify issues relevant to the seasonal habitation of the Abrolhos Islands by rock lobster fishers.
- To advise the Minister for Fisheries through AIMAC on matters relating to the management of the Abrolhos Islands Reserve and the State Territorial Waters.
- To advise the Minister for Fisheries, through the Rock Lobster Industry Advisory Committee (RLIAC), on matters relating to the Abrolhos Islands and rock lobster fishing in the State Territorial Waters of the Abrolhos Islands on which the advice of the sub-committee is sought by the Minister.
- To advise the Minister for Fisheries through AIMAC on matters relating to the maintenance and improvement of the Abrolhos marine and terrestrial environments.
- To develop mechanisms to assist in the resolution of community or infrastructure-related disputes that may arise on the fisher-occupied islands.
- To assist Fisheries WA and other relevant State agencies to develop minimum standards for buildings, jetties, moorings, waste disposal, public facilities, utilities and power generation.
- To determine arrangements for emergency management procedures for the Abrolhos Islands as part of the Geraldton—Greenough Local Emergency Management Plan.
- To assist, if required, in the management of heritage/historic sites and in conservation works.
- To liaise with, and advise, Fisheries staff on issues relating to the *Fish Resources Management Regulations (1995)*, Part 9, Abrolhos Islands Reserve.

- To review the *Abrolhos Islands Regulations (1995)*, which in part govern the use of occupied islands by fishers. Issues currently under consideration include:
  1. Use of fishers camps during the west coast rock lobster fishing season and off-season by other persons.
  2. Development of a lease arrangement for infrastructure (jetties, camps and other buildings) between the Minister for Fisheries and Zone A rock lobster fishers.

Other sub-committees may be formed to facilitate the expansion of the communication process and provision of advice for consideration by AIMAC (e.g., setting-up a research sub-committee to prioritise programs and specific projects).

## Strategies

### *Immediate*

5. *Develop disaster emergency plans for fires and cyclones. (FWA, WAPS, SES and WAFB)*
6. *Prepare land-use plans for all development sites on the islands which are consistent with the natural and heritage values of the Abrolhos. (AIMAC, FWA)*

### *Ongoing*

7. *Retain the Abrolhos Islands Land Management Sub-committee (AILMSC) to advise AIMAC on the planning and management of developed sites, and to ensure island residents are properly consulted in relation to decisions which affect them. (AIMAC)*
8. *Review the Abrolhos Islands Regulations and keep them continually updated. (AIMAC, FWA)*
9. *Consider the formation of other sub-committees to provide quality advice to AIMAC on specific issues. (AIMAC)*

## 4.4 Waste Disposal

The *Environment Protection (Sea Dumping) Act 1981* (Cwlth), which came into effect in March 1984, enables Australia to fulfil its international responsibilities under the *Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972* (London Convention).

The London Convention is aimed at promoting the control of sea pollution caused by waste dumping; which can result in human health hazards, harm to marine life and resources, damage to amenities and interference with other legitimate uses of the sea.

The major change under the London Convention's 1996 Protocol is a move from a prohibitive regime that states what items and materials may not be dumped at sea, to one which states what items and materials are permitted to be dumped.

With the adoption of the 1996 Protocol, the following list of seven items/materials are allowed to be dumped at sea. However, unless any items/materials proposed for dumping are included in the list, they cannot be dumped.

Materials listed are:

- dredged material;
- sewage sludge;
- fish waste, or material resulting from industrial fish processing operations;

- vessels and platforms or other man-made structures at sea;
- inert, inorganic geological material;
- organic material of natural origin; and
- bulky items, primarily comprising iron, steel, concrete and similarly harmless materials, for which the concern is physical impact. The disposal of this material is limited to circumstances where such wastes are generated at locations such as small islands with isolated communities having no practicable access to disposal options other than dumping.

### 4.4.1 Nutrients

The Abrolhos System is an area of high energy-receiving swell and wind, from a predominantly south-westerly direction. This situation results in the accumulation of macroalgae torn from the reef substrate. Nutrient-enrichment can occur inside the lagoon areas as a result of de-mineralisation of the macroalgae (Crossland *et al.* 1984).

In more open waters outside of the lagoons, nutrient levels are generally low (Johannes *et al.* 1983). The authors suggested that the only anthropogenic nutrient source in such areas is rock lobster bait, which would be insignificant.

Raised nutrient levels inside the reef lagoons could come from point source discharges of effluent. This may have direct deleterious effects on local coral calcification rates (Crossland 1982), or produce indirect smothering of corals by macroalgae proliferation due to excess nutrient loads in the water column.

## Strategies

### *Immediate*

**10. Develop a waste management strategy to ensure that pollution caused by human activities is minimised. Among other things the strategy should specifically result in the:**

- *proper disposal of flammable wastes;*
- *establishment of an appropriate monitoring program to assess the environmental impact of nutrient pollution in lagoonal waters from human activities;*
- *proper disposal of liquid wastes and an associated water quality monitoring program in the vicinity of outfalls; and*
- *disposal of solid wastes in a manner which meets the requirements of State and Commonwealth legislation. (AILMSC, FWA)*

**11. Immediately implement the waste management strategy. (AILMSC, FWA)**

### *Ongoing*

**12. AILMSC will continue to advise AIMAC on the progress of developing more efficient and environmentally acceptable waste disposal procedures at the Abrolhos. (AILMSC)**

## Section 5      Airstrips on the Abrolhos Islands

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### Objective

*Provide safe and efficient facilities to accommodate people being transferred by aircraft from the mainland to the Abrolhos and return in a manner which is consistent with the conservation values of the islands.*

There are three airstrips for fixed-wing aircraft in the Abrolhos Islands on Rat Island (Easter Group), East Wallabi Island (Wallabi Group), and North Island. The airstrips were developed and maintained by rock lobster fishers to provide transportation to and from the islands and as a method of emergency evacuation.

Pelsaert, Easter and Wallabi Groups are serviced by helicopter during the rock lobster season. A float plane service to the Abrolhos is now available all year around.

In 1996, the WA Government provided funds to substantially upgrade the airstrips. The airstrips consist essentially of the landing strips themselves, with very basic facilities.

The current arrangement with regard to use of the airstrips is that the Geraldton Fisherman's Co-operative has been granted exclusive permissive use. The Co-operative places advertisements in the press, seeking tenders from aviation businesses to provide the services of fixed-wing and helicopter transport to the islands - "for passengers involved in or related to the fishing industry only" - and appoints operators for a fixed term.

The current one-year contracts for fixed-wing and helicopter transport services expire on 28 February 1998.

Having a single line of responsibility for the safety aspects of the airstrips is the over-riding consideration for allowing a single fixed-wing operator to use the airstrips. The operator and the Co-operative are also responsible for the ongoing maintenance of the airstrips and helipads.

During the public comment period, a number of submissions expressed the view that the current arrangements are no longer necessary, inequitable and too restrictive. The Minister for Fisheries has requested a review of the current arrangements.

### Strategies

#### *Immediate*

**13. Review the Abrolhos Air Service to examine: service requirements; administrative arrangements; contractual arrangement; tendering processes and liability issues. (FWA)**

**14. Upgrade the Abrolhos airstrips and develop associated facilities, such as a waiting area for passengers, toilet facilities, telephone service, etc, in a manner consistent with the environmental values of the islands and the outcome of the Abrolhos Islands Air Service Review. (FWA)**

#### *Ongoing*

**15. Ensure that the airstrips in the Abrolhos are maintained at a safe and serviceable level. (FWA)**



## Section 6 Natural and Cultural Heritage Management

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### 6.1 Geology and Geomorphology

#### Objective

*Protect and conserve the geological and geomorphological values of the marine and terrestrial areas of the Abrolhos Islands.*

The Abrolhos Islands consist primarily of Pleistocene and Holocene limestone. Most of this limestone formed as coral reefs and in back-reef lagoons, with the reefs initially developing on an eroded substrate of Tertiary sediments.

On East, West Wallabi Islands and North Island the reef deposits are overlain by younger dune lime sands, similar to those in the Perth area. Recent storm-beach shingle deposits occur locally.

Extensive living coral reefs are present in the northern and eastern sides of each of the three island groups, with broken reefs elsewhere. They are the southernmost well-developed reefs in the Indian Ocean and attained their present form about 4,000 years ago.

Although in the Pleistocene inter-glacial period, coral grew on both the leeward and windward edges of the platforms, present growth is confined to the leeward margins and the sides of the channels, where the dominant branching and plate *Acropora* growth is extensive and dense.

A small but conspicuous headland of coralline limestone on East Wallabi Island is a fossil site of international significance. It is believed to date from the last inter-glacial stage of the Late Pleistocene, some 125 - 130,000 years ago. This was the last occasion when the global climate resembled that of the present time, and is a period which is currently the focus of a great deal of research worldwide.

Because the windward edges of the platforms are exposed to heavy wave action from ocean swells, the reef growth on them is in a very different form, consisting mainly of coralline algae binding coral rubble and limestone edges together as a solid pavement. The Easter and Pelsaert Groups have a triangular semi-atoll form, with a strong windward rampart facing the south-west, a central lagoon with well-developed sand sheets, and a diverse complex of leeward reefs on the northward and eastward sides.

The Abrolhos Islands have two distinct periods of formation. The Central Platform islands (North, East and West Wallabi Islands in the Wallabi Group; the Rat Island chain in the Easter Group; Gun, Middle and Murray Islands, and the numbered islands in the Pelsaert Group) all contain emergent reef which formed around 125,000 years ago (during the Last Interglacial).

The leeward islands, composed of coral rubble and present in all three groups, are much younger, and have emergent reef foundations which are about 5,000 years old (Collins *et al.* 1992, 1993, 1996, 1997; Wyrwoll *et al.* 1995; Zhu *et al.* 1993).

During the Quaternary, oscillating sea levels have repeatedly drowned and re-exposed the continental shelf. A sea level fall of 40m would be required today to expose the shelf between the islands and the mainland. The Abrolhos leeward islands recorded a relatively high stand of sea approximately 5,000 years ago. At 18,000 years ago, sea levels around Australia stood at -130m, rising to initiate Holocene reef growth beneath the leeward islands at about 11,000 years ago, at which time the Central Platform islands would have also lost their land connection.

Prior to the high sea level of 125,000 years ago, the Pleistocene record has up to four sea level oscillations, but these are as yet undated.

There are over 50 tidal ponds on the islands, ranging from small depressions to one that is over 100m in length. Except during major storms, the ponds are separated from the sea, but sea water seeps through the rock shingle into, and out of, some ponds. The ponds are thus tidal, with the tides in them lagging behind that of the adjacent sea by up to several hours.

The biota of the ponds is unusual. Many species abundant on the south coast of WA occur commonly as far north as Fremantle and the lower reaches of the Swan River. While these species are absent from the open coast north of Perth, they are common in the tidal ponds of the Abrolhos (Black & Johnson 1997).

### Strategies

#### *Immediate*

*16. Develop an inventory of the geological and geomorphological features of the Abrolhos System and prioritise areas for protection. (FWA, WAM, CURTIN UNIVERSITY, UWA)*

*17. Incorporate information about the need to protect fossil sites into the code of conduct for visitors to the Abrolhos. (FWA)*

#### *Ongoing*

*18. Ensure recreational and commercial activities are consistent with protection of the geological and geomorphological processes of the Abrolhos System. (FWA)*

## 6.2. Climate

The climate at the Abrolhos is similar to that of the adjacent mainland, but tempered by the ocean. Seasonal sea and air temperature ranges at the islands are less extreme than at Geraldton.

Winds exhibit both seasonal and diurnal patterns and are stronger offshore than on the mainland. The average rainfall is 469mm, from 89 rain-days.

The weather pattern is influenced by the north - south movement of the sub-tropical anticyclonic wind belt and an eastward progression of high pressure cells. Dominant wind direction in summer is from SE - SW, with high speeds: 76% of wind speeds exceed 20kph and 44% exceed 32kph. Calm conditions are rare and occur mainly in winter.

Storm events occur primarily in winter, but the Abrolhos is also subject to tropical cyclones. The possibility of wind speeds reaching 165kph occurs once every 50 years, with the possibility of 176kph winds once every 100 years.

## 6.3 Tides and Currents

The tides of south-western Australia are relatively small and “very irregular” (Dakin 1919), with a dominant diurnal component although semi-diurnal tides occur when the moon is near zero declination (Hodgkin & Di Lollo 1958). While the mean daily tidal range at Geraldton is about 0.6m (Easton 1970), tidal measurements in 1982 - 83 just north of Geraldton showed that the maximum daily tidal range during periods when the tide is dominantly diurnal is about 1m, compared with 0.4m when semi-diurnal conditions prevail (Stroud & Russell 1983, cited by Pearce 1997).



The tide-gauges installed at Rat Island and North Island during the mid-1980s enable the main features of the tidal signal at the islands to be compared with the much longer time-series at Geraldton. The tides are in fact very similar to those measured at the mainland in both summer and winter, and clearly display the diurnal/semi-diurnal pattern described above (Pearce 1997).

Monthly mean sea levels at Geraldton are higher in winter than in summer, partly because of the seasonal strengthening of the Leeuwin Current. The Leeuwin Current is a stream of warm, low-salinity water that flows at the surface from near North West Cape down to Cape Leeuwin and thence towards the Great Australian Bight, (Cresswell 1991), during the middle months of the year (Pattiaratchi & Buchan, 1991).

Inter-annual variability is also evident in the annual mean sea levels with a strong ENSO or “El Nino” link. This has been interpreted in terms of waxing and waning of the Leeuwin Current (Pearce & Phillips 1988, 1994): lower sea levels during ENSO periods correspond to a weaker southward current flow, while higher sea levels in non-ENSO years are associated with a stronger Leeuwin Current.

These inter-annual fluctuations in the strength of the Leeuwin Current may also have implications for recruitment of marine organisms to the islands from regions further north (Hutchins 1997a).

## 6.4 Marine Conservation

The Abrolhos Islands’ aquatic ecosystem is recognised as one of the most important marine environments in Western Australia. It has been the subject of numerous reports and differing recommendations regarding its conservation.

In 1989 the AICC Planning Strategy recommended that areas within State territorial waters around the Abrolhos Islands be declared an Aquatic Reserve under the Fisheries Act (see section 2.2.2 of this Plan) and the establishment of a series of marine reserves under the CALM Act.

In 1993 the AICC Aquatic Reserves Working Party recommended the establishment of four ROA’s to protect vulnerable resident reef fish species, and to provide areas where visitors could view good quality reef habitat and special reef features with substantial populations of these resident reef fish species. The Working Party did not consider marine reserves and the ROAs were gazetted under the Fisheries Act in May 1994 (refer Figures 4a, b and c.)

In June 1994 the report of the Marine Parks and Reserves Section Working Group (1994) recommended additions and extensions to the marine reserves proposed in the 1989 Planning Strategy to make them more representative of Abrolhos marine habitats, flora and fauna and to make better provision for public recreation. The areas recommended for reservation are shown in Figure 5. To date none of the recommendations have been implemented.

In September 1994 the Fish Resources Management Act 1994 came into force. Under this Act provision is made for the establishment of Fish Habitat Protection Areas (FHPAs) and management of the Abrolhos Islands Reserve. The Minister for Fisheries has stated his intention that a FHPA, comprising the waters around the Abrolhos Islands, be established. The relationship between FHPAs and marine parks is reflected in both the *Fish Resources Management Act 1994* and the *CALM Act*. FHPAs cannot be established in waters which comprise marine parks, and marine parks and their management plans take precedence when declared in existing FHPAs.

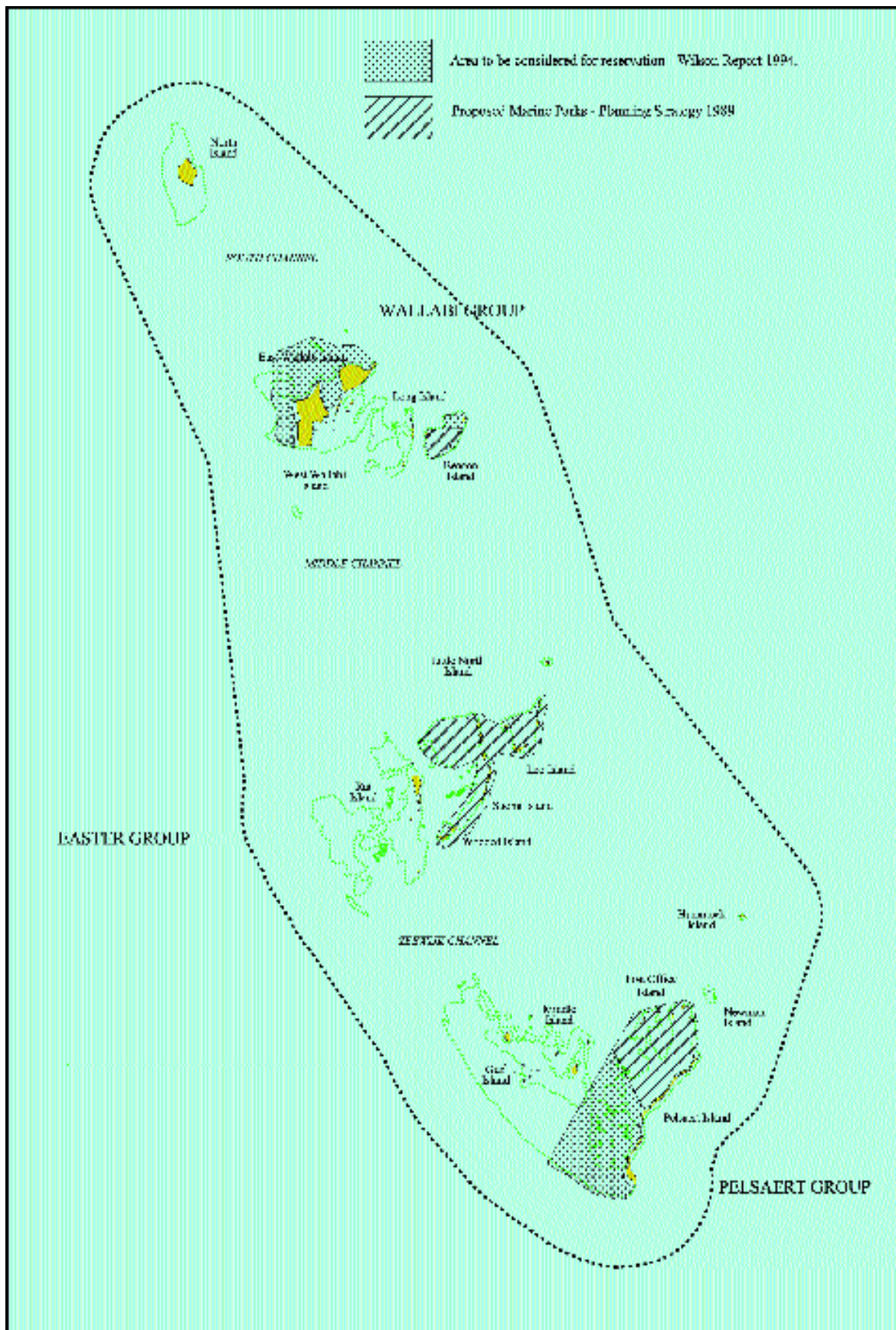


Figure 5: Recommendations of Previous Reports Relating to the Houtman Abrolhos.

In November 1994 the Government released its strategy document for conserving the marine environment (New Horizons in Marine Management, 1994). It foreshadowed the establishment of comprehensive system of marine reserves under the *CALM Act* and included provision for creation of FHPAs under the *Fish Resources Management Act 1994*, to protect fish in specific areas. This strategy was put into effect in June 1997 by the *Acts Amendment (Marine Reserves) Act 1997*, which established the Marine Parks and Reserves Authority.

It would be reasonable to assume that consideration will be given by the Marine Parks and Reserves Authority to the waters of the Abrolhos when that Authority makes its decisions on marine parks and reserves generally.

### 6.4.1 Fish Habitat Protection Area

As outlined in Section 6.3 of this document, a Fish Habitat Protection Area (FHPA) will be established pursuant to Section 115 of the *Fish Resources Management Act 1994*. Section 115 provides that the Minister for Fisheries may set aside an area of Western Australian waters as a FHPA for the following purposes :

- (a) the conservation and protection of fish, fish breeding areas, fish fossils or the aquatic ecosystem;
- (b) the culture and propagation of fish and experimental purposes related to that culture and propagation; or
- (c) the management of fish and activities relating to the appreciation or observation of fish.

The area proposed for the Abrolhos FHPA is the State Territorial Waters surrounding the Abrolhos. This includes the internal waters of the Abrolhos within the baselines, and waters within three nautical miles outside the baselines. The area will be set aside for purposes (a), (b) and (c) above (see Figure 2).

There is one major (Western rock lobster) and several minor commercial fisheries (Southern saucer scallops, finfish and a purse seine fishery targeting small schooling pelagic fish) dependent on the Abrolhos ecosystem. The system also supports recreational fishing activities.

It is proposed that commercial fisheries will be limited to a small number of high-value species. These will be harvested in such a manner that the biomass of those species exploited is maintained at a high level, so they can continue to fulfil their natural role.

Exploitation of resources will be managed so as to minimise impact on non-target species. This plan has been prepared to enable management of the whole ecosystem, rather than simply managing the individual exploited species for sustainable yields.

There is a recognition that other components of the natural ecosystem, whether they have an economic value or not, have their own intrinsic value. The economic benefits of fishing must be balanced with the need to protect the ecosystem.

The coral reef environment at the Abrolhos is a vitally important habitat for the western rock lobster and fish breeding area for a distinct local population of coral trout, and of secondary importance for baldchin groper and westralian dhufish.

The *Fish Resources Management Act 1994* defines fish as an aquatic organism of any species (whether alive or dead) except for the higher vertebrates and includes parts of an organism, such as a shell. Under this broad definition, all the biological components of the Abrolhos aquatic ecosystem with the exception of birds, mammals, reptiles and amphibians, are defined as fish. This includes the reefs themselves.

Increasing the availability of the natural values for appreciation by a wider section of the community, in such a manner that those values are not impaired, is a primary goal of management of the Abrolhos ecosystem. Management of the biological system and of activities relating to the appreciation and observation of its corals, fin-fish and other components are therefore purposes of the FHPA.

### Strategies

#### *Immediate*

19. *Declare the State Territorial Waters surrounding the Abrolhos Islands as a Fish Habitat Protection Area vested with the Minister for Fisheries under the Fish Resources Management Act 1994. (AIMAC, FWA)*

#### *Ongoing*

20. *Develop and implement a plan of management for the Abrolhos Island Fish Habitat Protection Area. (AIMAC, FWA)*
21. *Manage all activities to maintain and enhance intrinsic and ecological values of the Arolhos. (FWA)*
22. *Undertake research to develop an understanding of the ecology of the aquatic ecosystem and develop criteria to monitor its health. (FWA)*
23. *Review and improve existing and proposed mechanisms for ensuring identification, protection and appropriate management of high conservation value marine areas and report on all options, including marine reserves and “no-take” areas. (AIMAC, FWA, CALM)*
24. *Maintain and develop the cooperative relationship between AIMAC, Fisheries WA and CALM to ensure that an integrated, efficient and effective approach to planning, management and tenure continues to be implemented and, where necessary, improved. (AIMAC, FWA, CALM)*

## 6.5 Marine Areas

Because the coral reefs of the Abrolhos are at high latitude (south of 28°S), they have a mixture of tropical and temperate components. Maintenance of the coral communities is due to the existence of the southerly flowing Leeuwin Current, which bathes the reefs in warm water between March and September each year. Sea surface temperatures vary only slightly with the seasons (mean range 19°C - 24°C), due to the warm winter current. The sea water at the Abrolhos, as along the Australian west coast generally, is low in nutrients, unlike the western margins of the other continents with their currents that flow towards the equator and upwelling systems.

A feature of the Abrolhos marine ecosystem is the relationship between coral and macroalgae. Corals of the Abrolhos are slow growing compared to their tropical counterparts, and seaweeds compete with the coral for space, nutrients and available light.

Corals dominate in some areas, while macroalgae dominate others. In some locations, a fine balance exists between coral and macroalgae, with neither managing to gain advantage.

## 6.6 Marine Flora and Fauna

### Objective

*Protect the marine flora and fauna of the Abrolhos for their intrinsic and ecological value and for the use and enjoyment of future generations, while utilising selected species in an ecologically and economically sustainable manner.*

The marine plants and animals in the Abrolhos Islands system are a mixture of tropical and temperate species, characteristic of high latitude coral reefs. The system is in the warm temperate zone and has large areas of limestone reef and sand, typical of temperate WA waters, while the coral reef habitats and warm Leeuwin Current that flows southward in winter provide an appropriate environment for many tropical reef species. The Leeuwin Current is also a source of larvae from tropical areas for initial colonisation of the Abrolhos, and contributes to the replenishment of some species (Hutchins 1997a).

## 6.6.1 Marine Flora

### 6.6.1.1 Marine Algae

Marine macroalgae, or seaweeds, occur on hard substrates in the shallow waters of the Abrolhos. They provide a significant part of the primary production for the “foodwebs” that support animal communities, including those fish caught commercially and corals. A total of 260 species of benthic marine algae have been identified from the Abrolhos Islands (Huisman 1997).

Microalgae occur on bare rock surfaces, where they form the food source for grazing animals that are part of foodwebs for larger carnivorous or omnivorous species.

### 6.6.1.2 Seagrasses

Seagrasses are marine flowering plants that grow in shallow coastal areas, protected from oceanic swells. They are particularly diverse and abundant in south-western WA.

Seagrasses contribute to the overall productivity of an area and although few animals consume significant amounts of living seagrass, dead grass leaves break down to form detritus. This detritus is consumed by bacteria and small invertebrates which, in turn, are consumed by larger carnivorous species.

Seagrasses also reduce water movement and provide habitat for a diverse and abundant community of algae and small invertebrates that are also an important component of coastal food webs.

The seagrass species of the Abrolhos are typical of other south-western Australian areas. However, in contrast to the Abrolhos marine fauna, which has a strong tropical component, the seagrasses are predominantly cooler water species.

In total, ten seagrass species have been reported from the Abrolhos (Brearley 1997), ranging from small, delicate species to larger, more robust types that grow in large meadows. Small paddle-weeds (*Halophila*) grow in protected lagoon areas or deep waters between the islands (e.g., Goss Passage). The larger species may be found growing on reef as well as in sandy areas.

*Thalassodendron pachyrhizum* is found growing on the exposed reef crest areas. It has been recorded in a number of the island groups (Hatcher *et al* 1988).

Two species of wire-weed (*Amphibolis spp.*) endemic to southern Australia are also found at the Abrolhos. *Amphibolis antarctica* is the most abundant seagrass at the Abrolhos, while *Amphibolis griffithii* appears to be restricted to bays such as Turtle Bay in the Wallabi Group.

The larger ribbon-weeds (*Posidonia spp.*) grow in the sheltered bays and lagoons where the sand cover is deeper and more stable (e.g., Turtle Bay, the Gap, East Wallabi Island, the lagoon on the west side of West Wallabi Island and around North Island).

*Posidonia* species and *A. antarctica* are the major seagrass species along the west coast of Australia, as they are at the Abrolhos. The importance of seagrass habitats as nursery areas for juvenile rock lobsters has been demonstrated at other locations along the west coast (Chittleborough 1976; Joll & Phillips 1984).

Protection of the diverse seagrass communities in reefs areas and sheltered bays at the Abrolhos is necessary for the maintenance and functioning of these productive waters.

### 6.6.2 Marine Fauna

#### 6.6.2.1 Corals

The coral fauna of the Abrolhos is very diverse for such a high-latitude reef system, with 180 species from 40 genera of hermatypic and 10 species from eight genera of ahermatypic corals discovered so far. The tropical affinities of the fauna are highlighted by the fact that all but two of the coral species are tropical (Veron & Marsh 1988).

The greatest diversity and density of corals is found on the reef slopes, shallow reef perimeters and lagoon patch reefs in the more sheltered northern and eastern sides of each of the three platforms (Wilson & Marsh 1979).

However, in the earlier period of Pleistocene coral growth in the last interglacial period, extensive growth also occurred on the south-west margins, where they were fully exposed to the ocean swells.

The growth of at least two species of coral abundant at the Abrolhos has been found to be significantly slower than at several locations in the tropics (Crossland 1981; Simpson 1988). Crossland (1981) suggested that *Acropora formosa*, one of the dominant corals at the Abrolhos uses most of its production of calcium carbonate for elongation rather than strengthening of the skeletal framework, resulting in a more fragile structure than found in tropical areas.

Harriott (1997) re-examined this hypothesis and found it was not the case: individuals of *A. formosa* living at Coral Bay at Ningaloo Reef have the same skeletal density as specimens living in similar conditions of wave exposure in the Abrolhos.

The corals at the Abrolhos are potentially susceptible to overgrowth by temperate macroalgae. The importance of herbivorous fish in controlling the macroalgae has been demonstrated (Hatcher *et al* 1988). The Abrolhos corals are also subject to unusual environmental conditions including cyclones, extremely low tides and outbreaks of pest species.

#### 6.6.2.2 Other Benthic Invertebrates

Sponges, soft corals and gorgonians present in the Abrolhos Islands have not been studied to the same extent as the corals. However, they form the bulk of the vertical relief which gives the habitat its character on the limestone reef in deeper waters.

Crustaceans, molluscs (492 species; Wells and Bryce 1997), and echinoderms (172 species; Marsh 1994), as well as the less diverse phyla, are well represented at the Abrolhos. In all of these groups there is a complex assemblage of tropical species living in close association with temperate species and species endemic to WA. Tropical species dominate in most groups, but the great majority of the 37 species of hydroids recorded by Watson (1997) are temperate.

The most important single species commercial fishery in Australia is the western rock lobster (*Panulirus cygnus*), a west coast endemic species inhabiting most of the limestone reef and some tabulate coral areas in the Abrolhos. This species is the basis of the major human activity in the Abrolhos, the western rock lobster fishery.

### 6.6.2.3 Fin-fish

For such a southerly location, the Abrolhos has a spectacular variety of fish, large and small, and of tropical, temperate and endemic affinities.

Populations of large coral inhabiting species such as the baldchin groper and coral trout (the only area of high abundance of *Plectropomus leopardus* on the west coast of WA) are high, and individuals can be readily seen. A total of 389 fin-fish species have been recorded at the Abrolhos Islands (Hutchins 1997b). Small tropical reef fish species are also abundant in the coral areas.

It is thought that many of the tropical species occurring in the Abrolhos do not actually spawn in the islands, but instead are dependent for recruitment of larvae being carried southward by the Leeuwin Current from areas further north, such as Shark Bay or Ningaloo Reef. Similarly, populations of many tropical species occurring at Rottnest Island are dependent on larvae generated in the Abrolhos (Hutchins 1997a).

The temperate species such as pink snapper and westralian dhufish occur on deep water limestone reefs and in the shallower coral areas.

### 6.6.2.4 Marine Mammals

Sightings of humpback whales are common in Abrolhos waters between April and October each year, during their northward breeding migration and the return journey to Antarctica.

Dolphin species present all year round in Abrolhos waters include the bottlenose, striped and common dolphins. Small localised populations of the Australian sea-lion are found throughout the area.

### 6.6.2.5 Marine Reptiles

Turtles occur in the Abrolhos. There has been speculation that green turtles breed at North Island, but this has not been confirmed.

Sea snakes are not resident at the Abrolhos, but during strong winter storms they may be transported south to the Abrolhos from Shark Bay and further north.

## Strategies

### *Immediate*

25. *Continue to develop the present habitat maps of the marine environment of the Abrolhos. (FWA)*

26. *Undertake surveys of the major marine habitats to determine the flora and fauna present and which species are potentially at risk. (FWA)*

### 6.7 Reef Observation Areas

Reef Observation Areas (ROA) were established in 1994 pursuant to Sections 9, 10 and 11 of the *Fisheries Act 1905* (Figures 4a, 4b and 4c).

All species of fish including molluscs, algae, coral and fin-fish are totally protected in the ROA, with the exception of western rock lobster which may be taken by recreational and commercial fishers using pots during the season. Rock lobsters are not protected in the ROA because they are managed under the West Coast Rock Lobster Managed Fishery, as detailed in Section 8.1.2.1 of this report.

Since November 1993, the Easter Group and Wallabi Group ROA and adjacent control sites have been monitored to measure any changes in the baldchin groper and coral trout populations. This work indicates the ROA appear to have been effective in leading to increased localised populations of these two species and an increase in their average size (K. Nardi, pers. comm. 1997). The public consultation process has provided input supporting this view and recommendations have been made for retention of the ROA, with a higher level of surveillance by Fisheries WA.

There has also been a high level of community support for the ROA, along with involvement in their management.

However, after intensive consultation with stake-holders, several submissions indicated a need to review the boundaries of the ROA, while others called for an increase in their size. Some submissions advocated 'no-take' zones as a method to measure the effects of human activity on the marine environment. The commercial scallop fishing industry indicated that regulations totally excluding scallop fishing vessels from ROA were unnecessarily restrictive. They also indicated that the industry should have access to some small areas of the ROA.

### Strategies

#### *Immediate*

**27. Continue the fin-fish monitoring program in the Reef Observation Areas (ROA) to determine stock levels and the effects of the ROA. (FWA)**

**28. Increase public information about the ROA. (FWA)**

**29. Review the boundaries of all four ROA in the Abrolhos to accurately determine if they should be adjusted to provide better protection of the ecosystem. (FWA)**

#### *Ongoing*

**30. Retain existing regulations which protect the ROA, but increase surveillance and enforcement. (AIMAC, FWA)**



## 6.8 The Establishment of Benthic Habitat Baseline Data

For a number of years, sectors of the population have contended that commercial rock lobster fishing is a fishing activity that is incompatible with the “fragile” Abrolhos ecosystem.

In 1988, Hatcher, Hatcher and Wright produced a report, *The Interaction Between the Major Human Activities and the Marine Environments at the Houtman Abrolhos Islands of Western Australia*. A key issue identified by the report was that physical damage to sessile organisms by rock lobster pot-deployment, jet-boat grounding, wash and anchoring was a potential threat to the marine environment at the Abrolhos.

While these criticisms were aimed at the commercial rock lobster fleet, similar ones (except for pot deployment) could be leveled at charter boats, yachts and other vessels used by other sectors of the community.

Another source of damage to Abrolhos reefs, possibly of a greater magnitude than all the collective activities above, is storm damage. There is little in the way of quantitative data available on the effects of these events.

A study needs to be undertaken to provide a rational understanding of those activities designated as major potential threats to the Abrolhos environment. Benefits include establishing a quantitative data base for assessing the effects of fishing, boating and recreational activity, such as diving, at the Abrolhos.

The benefit of encouraging a wide range of research and long-term monitoring projects is that results can be incorporated into management programs. Monitoring can be used to detect changes both in the environment and user patterns.

Priority monitoring programs for the Abrolhos will include the detection of changes in marine flora and fauna population abundance, and impacts on the Abrolhos environs due to human usage. The nature of monitoring programs is long term. They are often designed as “before and after” impact/manipulative experiments, using a suitable number of non-impact (control) sites for comparison.

Fisheries WA is developing a Geographic Information System (GIS) to overlay human usage patterns on marine habitats at the Abrolhos and incorporate all relevant research and monitoring data that will assist with the management of the area.

Figures 6a, 6b, 6c and 6d depict the marine habitats at depths of ten metres, or less, for each island group. These marine habitats were derived from the ground truthing of Landsat TM and Spot remotely-sensed data.

### Strategies

#### *Ongoing*

**31. Undertake broad-scale benthic surveys of Abrolhos reefs to determine reef health and quantify the effects of human impacts and any spatial and temporal changes to these reefs. (FWA)**

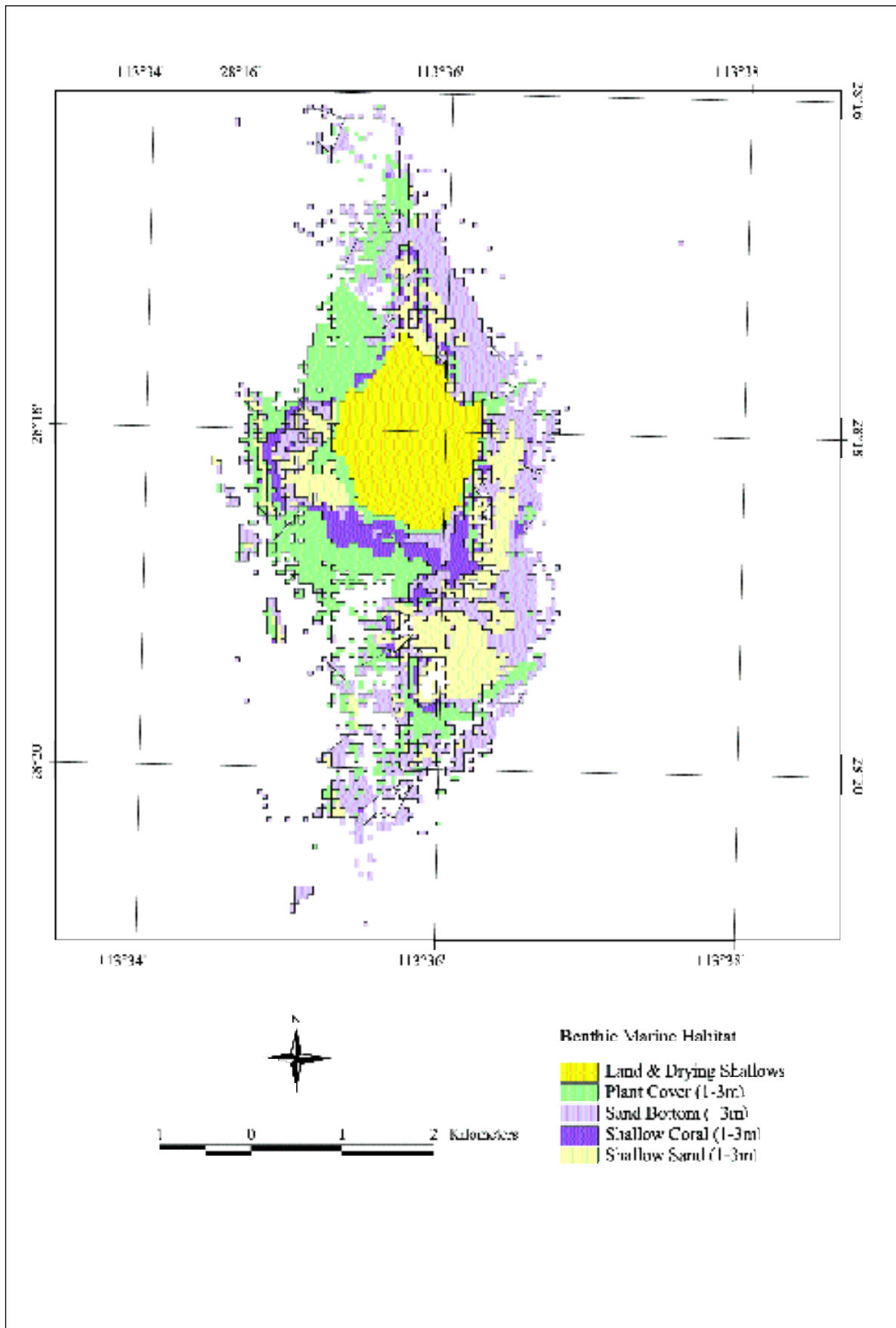


Figure 6a: North Island: Benthic Marine Habitat.

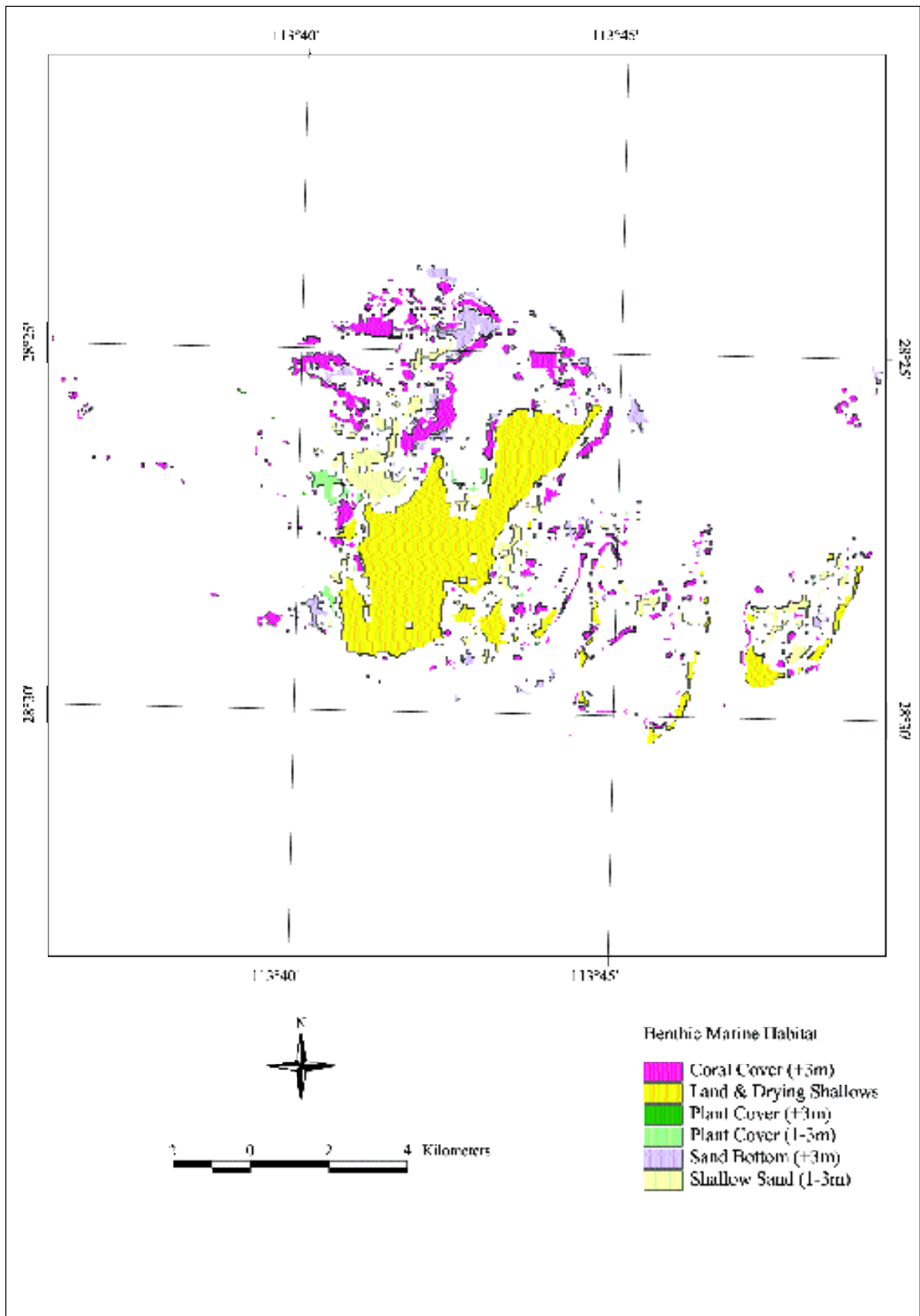


Figure 6b: Wallabi Group: Benthic Marine Habitat.

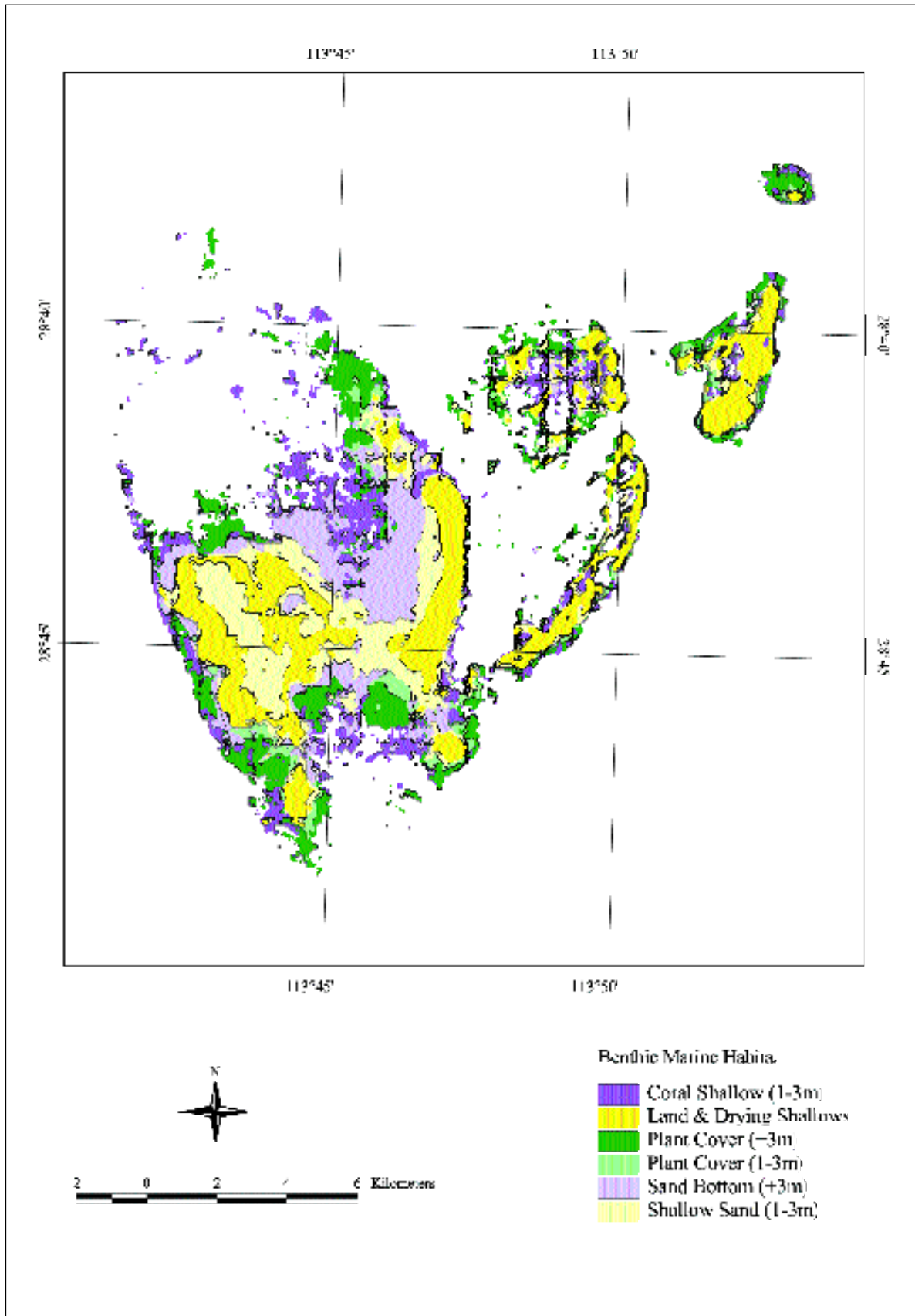


Figure 6c: Easter Group: Benthic Marine Habitat.

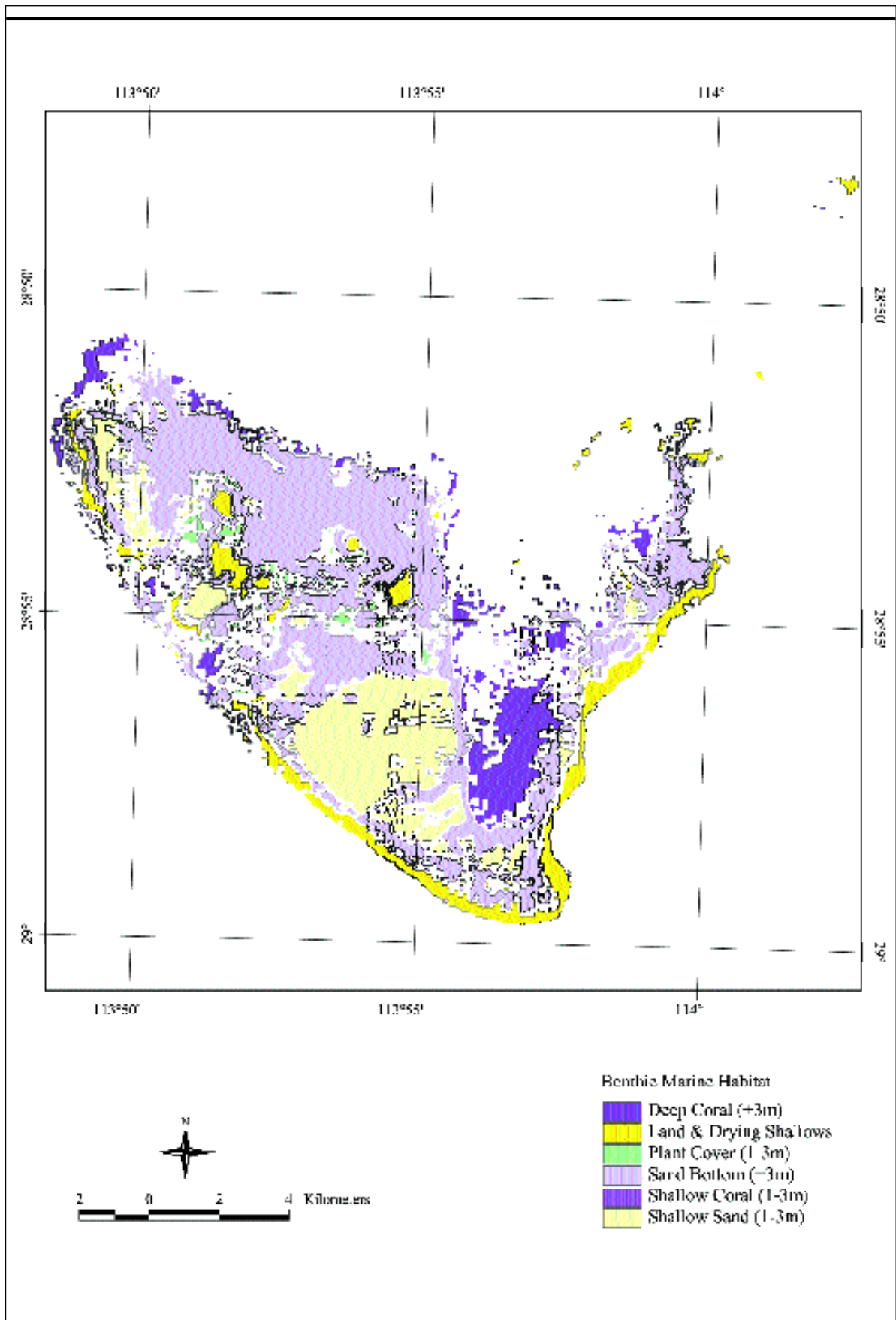


Figure 6d: Pelsaert Group: Benthic Marine Habitat.

### 6.9 Terrestrial Flora and Fauna

#### Objective

*Protect and conserve native flora and fauna communities on the Abrolhos Islands.*

The terrestrial environment of the Abrolhos System is of importance for the conservation of a number of species of plants and animals, some of which occur only on the islands. It is also a seabird breeding area of international significance.

Since 1982, a number of reports have been prepared which recognise the importance and values of the Abrolhos System. They have highlighted the need to manage the Abrolhos as a single ecosystem, on a multiple-use basis, with an emphasis on the need to protect and conserve the environment.

These reports were prepared on the basis of a limited information base, which must be developed as an integral part of the future management of the area. The recommendations of the reports were neither comprehensive or universally accepted, but have been carefully considered during the preparation of this management plan.

In 1982, the Mid West Regional Development Committee produced its report on the Houtman Abrolhos at the request of the Minister for Commercial and Regional Development, Tourism and the North West. It recommended that the Abrolhos System should be vested in one authority and a management plan be prepared, giving regard to the preservation of environmental, historic and economic components. The report also recommended that no tourism should occur on the islands and more research on them be undertaken.

In 1989, the former Abrolhos Islands Consultative Committee presented the *Abrolhos Islands Planning Strategy* to the Minister for Fisheries, Minister for Conservation and Land Management and Minister for Planning. It contained a number of strategies including proposals for a National Park on islands not utilised by the fishing industry and parts of North island, West and East Wallabi islands.

The current policy of government supports the vesting of the whole of the islands in the Minister for Fisheries. The establishment of a national park over the non-fishing islands and parts of fishing islands has been proposed on a number of occasions as a necessary strategic step. However, full consideration of that proposal is necessary to ensure effective integrated management of the whole of the islands.

#### 6.9.1 Terrestrial Flora

The vegetation of the Abrolhos Islands consists of a number of communities which are of special conservation interest. These are:

**Mangroves** These coastal plants live in the upper intertidal zone and a single species (*Avicennia marina*) occurs in the Abrolhos. They provide an important source of primary production for marine food chains and are an ideal habitat for animals, both marine species (fish and the Australian sea-lion) and terrestrial species (especially the lesser noddy).

Mangroves also protect the Abrolhos shoreline from storm damage and erosion. In places, they occur in land-locked lagoons.

***Atriplex cinerea* dwarf shrubland** These shrubs occur on sandy soils or shellgrit. The deeper soils supporting them are suitable for burrowing seabirds, such as shearwaters and petrels, to build nests.

**Saltbush flats** These are present on islands such as North and West Wallabi, but do not occur extensively elsewhere in the Abrolhos.

All native terrestrial flora at the Abrolhos Islands are protected under the *Wildlife Conservation Act 1950*.

There are no known Declared Rare Flora species occurring in the Abrolhos, but three species of flora included in the CALM's "priority flora" list are found on the islands. These are *Acacia didyma* (Priority 3), *Calocephalus aervoides* (Priority 3) and *Lepidium puberulum* (Priority 4).

Priority 3 flora species are defined as species which are found in several populations and not believed to be under immediate threat. Such taxa are under consideration for declaration such as "rare flora", but further survey work is required before a decision is made on their status.

Priority 4 flora species are defined as species which are considered to have been adequately surveyed and which, whilst being rare, are not currently threatened by any identifiable factors.

The main threats to flora on the Abrolhos Islands are associated with disturbance, either natural (fire, disease, etc.) or caused by human activities (including fire, trampling, grazing by feral animals, weed infestation, and clearing).

### 6.9.2 Terrestrial Fauna

Two indigenous mammals are found at the Houtman Abrolhos: the tammar wallaby (*Macropus eugenii*) and the bush rat (*Rattus fuscipes*). The former, described by Pelsaert in 1629, is probably the first marsupial observed by Europeans.

The tammar is a browsing animal, utilising the impoverished Island vegetation. It is adapted to survive in an environment with a meagre supply of fresh water and appears to obtain most of its water from the juices of plants. The tammar is especially known to feed on succulents, although non-succulent shrubs are also heavily browsed.

The distribution of the tammar and bush rat is restricted to East and West Wallabi Islands, although Storr (1960) had found skulls of tammars on North Island. This population has now been re-established.

It appears from Stokes' journals (1841) that during the nineteenth century, populations of the tammar were more numerous on the Wallabi Islands than they are at present.

The Australian sea-lion (*Neophoca cinerea*) visits the Houtman Abrolhos, but documentation on the size and location of colonies is limited. It is likely that the population of sea-lions was more numerous before the activities of the sealers and fishermen at the turn of the century (Storr 1964).

Whales and dolphins are present at the islands, but information on species, types and numbers is inconclusive.

All terrestrial fauna on the Abrolhos Islands are protected under the *Wildlife Conservation Act 1950*. The following Declared Rare Fauna occur on the Abrolhos:

- tammar wallaby (*Macropus eugenii*)
- Abrolhos painted-button quail (*Turnix varia scintillans*)
- lesser noddy (*Anous tenuirostris melanops*)

The following fauna which occur on, or around, the Abrolhos Islands are included on the Department of Conservation and Land Management's "priority fauna" list:

- brush bronzewing (*Phaps elegans*) (Abrolhos population) (Priority 4)
- Abrolhos dwarf bearded dragon (*Pogona minor minima*) (Priority 4)
- Houtman Abrolhos spiny-tailed skink (*Egernia stokesii stokesii*) (Priority 4)

Priority 4 fauna species are defined as taxa which are considered to have been adequately surveyed (or for which sufficient knowledge is available), and are considered to be not currently threatened or in need of special protection. These species, usually represented on land that has been put aside for conservation, are considered as taxa which are declining significantly, but not yet threatened.

The main threats to fauna on the islands are associated with disturbance of habitat and predation from feral animal species, such as cats. Disturbance may also be caused by human activities such as fire, trampling, grazing by feral animals, depletion of food source(s), weed colonisation, oil pollution and unplanned clearing. Rising sea levels due to cyclonic events may provide short-term threats to fauna.

### 6.9.3 Birds

Birds are the most noticeable and numerous fauna on the Abrolhos Islands. The Abrolhos support hundreds of thousands of seabirds and are regarded as one of the most important bird breeding areas in Australia. General features of the bird populations are:

- The Abrolhos support the largest breeding seabird colonies in WA of the wedge-tailed shearwater and little shearwater; white-faced storm petrel; common noddy, lesser noddy, caspian tern, crested tern, roseate tern and fairy tern. The islands are also important breeding grounds for the eastern reef heron, pacific gull, bridled tern, white-breasted sea eagle and osprey.
- Two species of seabirds identified as rare, likely to become extinct, or in need of special protection under the *Wildlife Conservation Act 1950* have been recorded on the islands: the red-tailed tropic bird and the lesser noddy.
- The red-tailed tropic bird formerly nested on Rat and Pelsaert islands. Birds are still occasionally seen, but they no longer breed in the Abrolhos. With proper management, it is hoped breeding colonies will become re-established.
- Three islands - Morley, Wooded and Pelsaert - support the only breeding colony in Western Australia of the lesser noddy. The only other population of this species is a separate sub-species which lives in the Seychelles Islands.
- In addition to the lesser noddy, the Abrolhos support another endemic bird sub-species, the painted button-quail.
- The Abrolhos are important to WA's seabird populations because they support species whose overall numbers are decreasing. These include the sooty tern (which has few other WA breeding sites), fairy tern, roseate tern and little shearwater. The mainland populations of the brush bronzewing are decreasing.
- In south-western WA, autumn is usually the important breeding season for seabirds, but at the Abrolhos 90% of all laying occurs during the spring. In fact, the Abrolhos Islands bird breeding season can extend from late winter to early summer. The factor(s) responsible for this phenomenon are unknown, but it is thought to be related to a peak in food supply. Only the little shearwater, roseate tern, silver gull and white-breasted sea eagle breed during the winter months on the Abrolhos (Storr, Johnstone & Griffin, 1986).

### 6.9.4 Mammals

Only two species of indigenous land mammals have been recorded on the Abrolhos Islands. The tamar wallaby has been recorded on East and West Wallabi and North Island. This species has been gazetted "rare or otherwise in need of special protection." The bush rat has been recorded on East and West Wallabi islands.



### 6.9.5 Reptiles

Twenty-six species of reptiles have been recorded by the Western Australian Museum on the Abrolhos Islands (WA Museum records).

The Wallabi Group, particularly East and West Wallabi islands, has been identified as the richest of the island groups for reptiles, with 22 species representing seven families being recorded from this group. The islands support two species which have been identified as rare or otherwise in need of special protection: the spiny-tailed skink (*Egernia stokesii stokesii*) and the carpet python (*Morelia spilota imbricata*).

### 6.9.6 Observing Flora and Fauna

This activity, or set of activities, is linked to growing appreciation of the cultural and heritage values of the Abrolhos. Often visitors who pursue observation of animal and bird life in the Abrolhos are the same individuals who actively seek to view and appreciate the islands' historic sites.

West Wallabi Island is a particularly popular place for combining an appreciation of terrestrial flora and fauna and historical sites, with a relatively easy walk to the "forts" (remnants of the *Batavia* mutiny in 1629), generally also resulting in good animal and bird sightings.

The seabird rookeries on the Abrolhos Islands are a distinct attraction for amateur ornithologists. These rookeries attract a particular group of visitors, a high proportion of whom are international visitors.

During March to June, when visitor numbers are high, seabird colonies are more dispersed, but are still significant attractions, especially those of ospreys and white-breasted sea eagles. Lesser noddy colonies, particularly on Wooded and Morley Islands, are also popular visitor sites.

If there is a problem with appreciation of the terrestrial wildlife of the Abrolhos, it is that of people accidentally interfering with tern colonies during the breeding season. The terns often nest in high densities near shorelines or in coral shingle, so it is relatively easy to inadvertently disturb them and tread on eggs or chicks. Fortunately this problem is minimised by the low number of visitors to the islands during the breeding season.

## Strategies

### *Immediate*

**32. Develop a habitat map of the terrestrial environment of the Abrolhos. (FWA, CALM, WAM)**

**33. Undertake additional surveys of the major islands to determine which flora and fauna are present, and which species, if any, are at potential risk. (CALM, FWA, WAM)**

### *Ongoing*

**34. Review the adequacy of existing and proposed mechanisms for ensuring identification, protection and appropriate management of high conservation value terrestrial areas and report on all management options. (AIMAC, FWA, CALM)**

**35. Advance the establishment of the most effective mechanisms for ensuring identification, protection and appropriate management of high conservation value terrestrial areas and develop strategic management plans. (FWA, CALM)**

## 6.10 Introduced Flora and Fauna

### Objective

*Prohibit the introduction of exotic species of flora and fauna on the Abrolhos and remove exotic species already occurring on the islands.*

Over time, people have deliberately or inadvertently introduced a number of exotic plant and animal species on the Abrolhos Islands. Strategies are required for the eradication or control of introduced flora and fauna, and to prevent the introduction and spread of any additional species.

Feral species of animals known to have occurred on the islands include rabbits, rats and cats.

In early December 1991, staff from Fisheries WA and CALM undertook a successful black rat and cat eradication program in the Easter Group. Ongoing African boxthorn eradication programs occur on the islands in the Southern Group.

### Strategies

#### *Immediate*

**36. Survey exotic species of plants and animals on the Abrolhos to establish the species present and develop a plan for their removal or management. (FWA, CALM)**

#### *Ongoing*

**37. Prepare and implement a management plan for preventing the arrival of exotic species of flora and fauna, and managing or eradicating such species which may already be present. (FWA, CALM)**

## 6.11 Fire Management

### Objective

*Ensure that fires do not adversely impact on the life, property and conservation values of the Abrolhos. To date, no fire history of the Abrolhos Islands has been prepared. During the early 1930s, a fire on North Island burnt out a major portion of vegetation on the island, and the area is still visible to this day. Strategies are required for the fire management of both inhabited and uninhabited islands.*

### Strategy

#### *Immediate*

**38. Prepare and implement a fire management plan for the Abrolhos consistent with conservation of the environment whilst protecting property and developments. (FWA)**

## 6.12 Historic and Heritage Sites

### Objective

*Conserve historic and heritage sites on the Abrolhos Islands.*

The Abrolhos Islands are a unique part of Australia's heritage, with a violent and colourful past. There is increasing interest in the historical, archaeological, cultural and heritage values of the Abrolhos. Staff of Fisheries WA working at the Abrolhos have noticed a significant recent increase in the numbers of people making the effort to visit the historic sites.

### 6.12.1 Historic Shipwrecks and Associated Sites

The wreck of the *Batavia* and the associated land sites on Beacon Island, Long Island and East and West Wallabi Islands together comprise one of the most important maritime archaeological sites in Australia. The sites are of international significance and a major attraction for visitors to the islands.

Shipwrecks and associated land sites are protected under Western Australia's *Maritime Archaeology Act 1973* and the Commonwealth *Historic Shipwrecks Act 1976*. There is provision in those Acts for appointment of inspectors, but at present none have been appointed in WA.

The islands of the Abrolhos are situated in State Territorial Waters as defined by the baselines in the Commonwealth of Australia Gazette, No. S29, 9 February 1983. They therefore fall within the jurisdiction of WA legislation.

Several shipwrecks in the Houtman Abrolhos are gazetted as Historic Shipwrecks under the Commonwealth *Historic Shipwrecks Act 1976*. These are: *Batavia* (1629), *Zeewijk* (1727), *Ocean Queen* (1842), *Hadda* (1877), *Ben Ledi* (1879), *Marten* (1879) and *Windsor* (1908).

Under the terms of the State *Maritime Archaeology Act 1973*, a historic ship is deemed to be "any ship that before the year 1900 was lost, wrecked or abandoned, or was stranded, on or off the coast of Western Australia." Hence, all of the above except the *Windsor* are assured of protection under the State Act.

The Acts are complementary and primarily designed to prevent alteration, destruction, damage, looting and theft. They are not intended to prevent access to wreck sites for recreation.

Rather, divers are encouraged to visit, enjoy and learn from wreck sites. The sites are an important element of our maritime heritage, and the laws are there so that everyone may have equal opportunity to share this heritage.

The main requirements placed on divers at wreck sites are that they should:

- provide information on any new find and help the delegated authority (Director, Western Australian Museum) in pursuing the matter;
- provide information on the whereabouts of relics or articles from a declared shipwreck, if they or their present whereabouts have not been notified previously;
- keep any relics legally held (i.e., with the written permission of the relevant delegated authority) in a manner consistent with the conditions of the permit; and
- cooperate with an inspector authorised to carry out inquiries and site supervision under the Acts.

Divers must not:

- remove relics or articles, interfere with or damage declared historic wreck sites or sites not yet assessed; or
- enter a declared prohibited zone around a wreck site without a permit.

Currently, no historic shipwrecks in the Abrolhos have been gazetted with a declared prohibited zone. Divers may therefore visit wreck sites for recreational purposes, but must abide by the laws embodied in the Acts.

### 6.12.2 Land Sites

Terrestrial areas currently designated as maritime archaeological sites in the Houtman Abrolhos include:

- sites associated with the survivors of the Dutch shipwrecks *Batavia* and *Zeewijk*; and
- sites associated with the survivors of post-European settlement shipwrecks.

Again, the aim of the protecting legislation (see the previous section) is to prevent unlawful alteration, destruction, damage, looting and theft; and promote cooperation with any person authorised to inspect or deal with the site.

### 6.12.3 Guano Mining

During the Australian colonial period, guano mining occurred on several islands at the Abrolhos. Small-scale removal of guano probably commenced in 1847 in the Pelsaert Group, when a private firm established a fishing company on the islands.

Large-scale mining of guano commenced in 1883, when another private company gained leases over 20 islands. Rat Island, Gun Island and the southern part of Pelsaert Island were extensively mined for guano. Mining activities continued until the 1920s when chemically derived fertilisers replaced guano.

With the reduction in supply of phosphates during World War II, the British Phosphate Commission (BPC) was granted leases at the southern end of Pelsaert Island. Buildings and jetties were erected by BPC, with production occurring from 1944 to 1946. After production ceased, an attempt was made by another party to provide tourist accommodation using these buildings, but this failed.

Other Abrolhos sites, such as stone jetties and tramways associated with guano mining, were recommended by Green and Stanbury (1988) and Stanbury (1993) for recognition as places of historical interest and consideration for protection under heritage legislation. These are Sweet Island; the small islands in Pelsaert Lagoon; parts of West Wallabi Island and Rat Island associated with guano mining; and parts of other islands already recommended for full protection as maritime archaeological sites.

### 6.12.4 Other Historic Sites

Some of the rock lobster fishermen's huts in the Easter Group have also been recognised as having heritage interest. No doubt this would also apply to huts on other inhabited islands.

## Strategies

### *Immediate*

**39. Include information about the need to protect the sites in the code of conduct for visitors to the Abrolhos. (FWA)**

**40. Train fisheries officers in the management of historic sites and provide them with delegated powers as inspectors pursuant to the Historic Shipwrecks Act 1976. (WAM)**

### *Ongoing*

**41. Prepare and implement a management plan for the protection of historic shipwrecks, associated land sites and other sites of heritage value. (WAM, FWA).**

**42. Prepare and implement a public information program about the heritage sites and their history so that people may learn about and enjoy them, and assist in their protection. (FWA, WAM)**

## Section 7 Marine and Terrestrial Resource Utilisation

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### 7.1 Tourism

#### Objective

*Manage environmentally sustainable nature-based tourism which is consistent with the values of the Abrolhos System and provides appropriate access to the area for the community.*

The Abrolhos is one of the most interesting maritime environments of Western Australia. It offers a variety of opportunities for visitors to encounter nature, by boating, diving, undertaking surface activities, fishing, and viewing fish and other marine life.

Access to the Abrolhos has been limited by its distance from land and the absence of facilities for visitors on the islands. People may stay with fishers who are resident on the islands, or they may stay on boats.

Camping is not permitted on the Abrolhos. At present, there are few opportunities for tourism on the islands.

Several studies have been undertaken to examine whether further tourism development should be allowed on the islands and waters of the Abrolhos. The most recent of these was the Abrolhos Islands Consultative Council's *Final Report on Tourism at the Abrolhos Islands* released in June 1995, which examined existing and proposed tourism and recreational uses for the islands.

The Council report concludes that large-scale developments on the islands would be ecologically damaging and probably not economically viable. However, it found that there are substantial opportunities for the development of nature-based tourism ventures in the Abrolhos, provided they are undertaken in an environmentally sensitive manner.

The Council report provided a broad framework for the development and management of tourism at the Abrolhos. It contained 24 recommendations and cautioned that further studies were required to ensure that management guidelines for both tourism and the environment were in place before further development occurred.

AIMAC reviewed the Council report and endorsed its broad thrust relating to the need to improve public access and most of its recommendations in principle. AIMAC suggested that most recommendations could be advanced in the near future, but determined that the remaining recommendations 2, 3, 5, 6 and 7 required further consideration.

However, the public consultation process which preceded the preparation of this draft revealed that many groups considered that the Council report was deficient in some areas and required a measure of review. In addition, information received from the Great Barrier Reef Marine Park Authority indicates that tourism development must be developed in a planned and strategic manner if opportunities are to be maximised.

The public submission process raised 31 issues relating to tourism and some of these require further investigation and consideration. Some matters of particular concern were:

- the need to ensure development is consistent with the conservation of the area;
- the requirement for equity of access;
- the need for fishers and tourism operators to cooperate;
- the need to further examine the possibility of using some inhabited islands for tourism development;

- the possibility of using East Wallabi Island for land-based tourism;
- the need to monitor tourist numbers;
- the need for the Government to recover the cost of administering tourism while retaining affordable public access; and
- the need to plan infrastructure development.

These issues require further consideration and consultants have been engaged to liaise with interested groups and individuals and make detailed investigations.

### Strategies

#### *Immediate*

**43. Develop a management plan for environmentally sensitive tourism at the Abrolhos, including policies and operating guidelines. (AIMAC)**

**44. Investigate the potential of marine and land-based tourism sites, assess environmental constraints and develop rules and a code of practice for tourism development. (FWA)**

**45. Develop application guidelines and performance criteria for venture proponents, along with a procedure to aid assessment of a proponent's proposal and ability to perform. (AIMAC)**

#### *Ongoing*

**46. Manage environmentally sensitive tourism in the Abrolhos through the development of appropriate management methods. (AIMAC)**

## 7.2 Recreational Fishing

### Objective

*Provide continuing access for recreational fishers at the Abrolhos while ensuring that fishing is sustainable.*

Recreational fishing is increasing at the Abrolhos Islands as the number of participants and visitors grow. Anecdotal evidence supports the general observation of a decline in numbers of fish taken per fisher.

However, another factor is also at work: changes in community attitudes and the success of Fisheries WA's Fish for the Future recreational fishing ethic. It appears also that the incidence of "high-take" fishing, prevalent in the 1980s and before, is decreasing, with a more responsible attitude being displayed by fishers.

During the consultation process, a number of matters were raised with regard to recreational fishing. These included:

- a general belief that while recreational fishing is not closely monitored, it contributes to the overall fishing pressure (which is too high);
- there are conflicting views about the effects of spear fishing, although there is strong support to ban spear fishing using compressed air apparatus; and
- there is a need for tighter controls on the recreational catch.

Recreational fishing may be loosely divided into three groups:

1. People living in professional fishers' camps;

2. Visitors in private vessels; and
3. People visiting as part of charter boat operations.

The first of these groups is unique to the Abrolhos Islands. For these people, recreational fishing is predominantly a small boat or dinghy activity, concentrated on the lagoonal shallows of the islands.

In the past, a high level of spear fishing formed part of this group's fishing activities, but this is now decreasing with the general view that spearing and line fishing high numbers of resident reef fish species is no longer acceptable.

Depending on a fisher's level of experience, they may be successful at regularly attaining bag limits, especially of baldchin groper and, to a lesser extent, coral trout. It is possible that these fishers have a significant impact on reef fish populations in shallow areas.

Less is known about the second group of private boat owners. Their experience and the amount that individual fishers catch varies widely.

Some people fish in the lagoons, while others fish over a wider area and concentrate more on pink snapper, westralian dhufish and trolling for mackerel. Many private boat owners fish only for their immediate needs, especially those on cruising yachts.

The third group of recreational fishers - charter boat fishers - is subject to more control than either of the first two groups. Most charter skippers are aware of the need to conserve fish stocks and limit the effects of spear fishing in certain areas.

Recreational lobster fishing at the Abrolhos is at a low level.

To ensure the compliance of recreational fishers with bag and size limits, it is far simpler for fisheries officers to sight and measure whole fish, rather than try to identify frozen blocks of white fish flesh where the skin is not always present.

### **7.2.1 Spear Fishing**

Spear fishing is a popular activity at the Abrolhos Islands. Its effects are specific as fishers selectively target particular species, taking into account the size of individual fish.

There are no valid reasons, in terms of resource sharing between spear fishers and line fishers, to justify prohibiting spear fishing throughout the Abrolhos Islands, as spear fishers are limited by general bag limits.

However, there is considerable public support for the prohibition of spear fishing using compressed air apparatus at the Abrolhos Islands, as part of an overall effort to restore local resident reef fish populations.

### **7.2.2 Tame Fish**

Over the years, people have been hand-feeding samson fish and yellow tail kingfish in some of the commercial mooring areas of the Abrolhos. The fish have become very tame and feeding them has become a popular attraction for both visitors and resident rock lobster fishers.

Under current regulations, these fish are protected from fishing of any sort.

### **7.2.3 Collection of Marine Life and Shells**

Part of the rationale for the development of the Fish Habitat Protection Area is to retain, in as pristine form as possible, the habitat on which particular fish populations depend. The collection of coral, fish for aquarium purposes, shells and other marine creatures from a particular area can change the habitat, by removing species.

In the case of shell collecting, many non-target species can be killed if rocks turned over during collecting are not returned to their original positions.

### Strategies

#### *Immediate*

47. *Continue research into the abundance of target species and catch levels in the Abrolhos. (FWA)*
48. *Review recreational fishing regulations for the Abrolhos Islands. (FWA)*
49. *Consider the reduction of recreational daily bag limits for Prize Fish and Reef Fish as part of the review of recreational fishing regulations. (FWA)*
50. *Commercial rock lobster fishers taking fish recreationally for their own use should be subject to the same regulations as recreational fishers during the Abrolhos rock lobster season, within the State Territorial Waters. (FWA)*
51. *Recreational fishers should be required to label their Abrolhos catch as their own. (FWA)*
52. *Prohibit spear fishing with the use of compressed air at the Abrolhos Islands. Retain the prohibition of spear fishing in Reef Observation Areas. (FWA)*
53. *Retain existing regulations protecting samson fish and yellow tail kingfish in anchorage areas. (FWA)*
54. *Negotiate with the Recreational Fishing Advisory Committee and RECFISHWEST with respect to prohibiting the collection of corals, aquarium fish and shells. (FWA)*
55. *Investigate mechanisms to monitor the success of the above strategies and any impediments to their enforcement. (FWA)*

#### *Ongoing*

56. *Apply the Fish Resources Management Act 1994 regulations relating to the taking of fish in the Abrolhos. (FWA)*
57. *Modify the regulations relating to the taking of fish in the Abrolhos from time to time, if information available to Fisheries WA demonstrates more stringent ones are required. (FWA)*

## 7.3 Diving

### Objective

*Encourage divers to enjoy the marine environment of the Abrolhos while minimising adverse impacts on the environment.*

The spectacular coral reefs and bombies of the Abrolhos, lush growths of kelp, varieties of fish and shipwrecks provide a wealth of fascinating dive sites in the islands. These sites range from well-protected areas suitable for the novice diver, to exposed ones which should only be visited by advanced divers.

Diving activities in the Abrolhos are linked to the growing appreciation of the cultural and heritage values of the islands. Often, the visitors who pursue these activities are the same ones who visit historic sites on the archipelago.

Provision has been made for diving activities to increase and have a focus, with the creation in May 1994 of the four Reef Observation Areas (ROA).



Sea-lions are a popular attraction with visitors and resident fishers alike and it is a particular delight of visiting the Abrolhos to snorkel with them. However, extreme care should be exercised at all times by divers engaging in this activity, as sea-lions are large and may become over friendly.

From time-to-time, whales enter the lagoonal or eastern passage areas of the Abrolhos, sometimes making spectacular viewing.

Passive fish and dive site appreciation activities are increasing at the Abrolhos. Coral reef and other dive sites, particularly in the aforementioned Reef Observation Areas, offer scope for these activities. Diving activities are specifically catered for by charter boats.

Diving activity in very shallow areas can result in damage to coral, in particular to staghorns, which may break off after contact with the fins and knees of divers.

Wreck diving, often coupled with historic appreciation, is a popular activity. Caution must be exercised by wreck divers, as sea conditions are often dangerous at many sites.

Wreck divers at the Abrolhos should always be accompanied by someone who has experience in the area and local knowledge of dive site conditions.

The first “dive trail” in the Abrolhos was opened in May 1997. It is at the north end of Long Island in the Wallabi Group, where there are three large Porites bombies, other corals, a variety of macroalgae, and a large number of fish. Other dive trails are planned.

## Strategies

### *Immediate*

*58. Identify sites, in consultation with the community, which are suitable for the development of dive trails and establish a priority order for their development. (FWA)*

*59. Develop a code of conduct for dive charter operators. (FWA)*

### *Ongoing*

*60. Prepare information for the public about dive sites in the Abrolhos in consultation with diving clubs. (FWA)*

*61. Incorporate recommendations on diving in the code of conduct for the Abrolhos. (FWA)*

*62. Monitor intensity of diving in the Abrolhos, and any effects divers may be having on the environment. (FWA, dive clubs)*

## 7.4 Surface Water Activities

### Objective

*Encourage visitors to enjoy the variety of surface water activities available in the Abrolhos, while at the same time minimising adverse impacts on the marine environment.*

Swimming and snorkelling are popular activities at various anchorages and beach landing sites at the Abrolhos. They are also commonly pursued by children near jetties and pontoons in commercial anchorages. Surfing is a popular after-work activity at selected reef breaks with some fishers at the Abrolhos. The surf is neither consistent nor available on a regular basis all year round.

Surfers are banding together to organise private or charter trips to the Abrolhos. Their impact is negligible, as surfing is generally a totally water-borne activity.

“Scurfing” (being towed behind a dinghy on a surfboard) is also a popular activity in some commercial anchorage areas, during school holidays and over Easter. This is a fledgling activity at the Abrolhos, at present generally confined to the leisure time of resident fishers.

The Abrolhos Islands provide good windsurfing/wave jumping potential. Given the current level of interest of visiting overseas and Australian windsurfers (in Geraldton, in particular), it is likely that the Abrolhos will become a sought-after windsurfing adventure destination in the future. Again, this is a fledgling leisure activity at the Abrolhos, but is becoming increasingly popular with some resident fishers.

An increasing number of the larger visiting pleasure boats carry personal powered water craft on-board, e.g., a jet-ski. In addition to potential noise pollution, jet-skiing has the capacity to impact on other water uses and may need regulation.

There is potential for jet-skiing to interfere with rookery sites or sea-lion populations on, or near, uninhabited islands. Speed limits may be introduced to limit its potential impact on Abrolhos fauna.

### Strategies

#### *Ongoing*

**63. Provide information to visitors on the various surface water activities available in the Abrolhos. (FWA)**

**64. Incorporate recommendations on surface water activities in the code of conduct for the Abrolhos. (FWA)**

**65. Monitor intensity of participation levels in surface water activities in the Abrolhos, and the effects these may be having on the environment. (FWA)**

**66. Exclude the use of personal powered watercraft except in designated areas. (FWA, DOT)**

## 7.5 Yacht and Power Boat Visits

### Objective

*Encourage visitors on yachts and power boats to enjoy the Abrolhos, while at the same time minimising adverse impacts on the marine environment.*

The Abrolhos is a traditional destination for many cruising yachts and power boats. Many yacht clubs have approached Fisheries WA for specific information and talks on the Abrolhos.

At Easter and other holiday times, there may be crowding in some anchorages which can result in problems, especially during changeable weather patterns. Yachts tend to stay in one anchorage for a longer time than other private pleasure craft, and are quite often part of an organised group activity.

Unless the yacht’s crew know their way around the waters of the Abrolhos, their mobility around island groups is often restricted because of their draft and slow speed.

Visitors to the Abrolhos Islands and their surrounding State Territorial Waters must not have domestic pets aboard their vessels.

Specific recommendations on moorings, use of jetties and anchorage sites are made in Section 9 of this document.

### Strategies

#### *Ongoing*

**67. Provide information to visitors on yachts and power boats on conditions in the Abrolhos. (FWA)**

**68. Incorporate recommendations on yacht and power boat visits in the code of conduct for the Abrolhos.(FWA)**

**69. Monitor yacht and power boat visits to the Abrolhos, and the effects these may have on the environment.(FWA)**

## Section 8 Marine Resource Utilisation

### 8.1 Commercial Fishing

#### Objective

*Ensure that commercial fishing occurs on a sustainable basis.*

Commercial fisheries in the Abrolhos are managed by Fisheries WA as part of their overall management of fisheries throughout the State. Abrolhos fisheries are thus not managed in isolation, but as part of the populations of targeted fish species which occur along the west coast, and beyond.

Research work in the area, and consultation with industry, has led to a good understanding of the fisheries operating at the Abrolhos. These are continuous research and consultative activities.

The public consultation process has raised a number of issues of concern about commercial fishing activities, which have been considered during the preparation of this management plan. The strategies being used to address some of these issues will be pursued in the longer term.

Issues of particular concern include:

- the need to manage the Abrolhos on an ecosystem basis, rather than as a system of individual activities;
- the need to review the overall fishing pressure on fin-fish and where possible reduce the level of effort;
- the need to consider possible environmental effects of fishing, including habitat damage by anchors, rock lobster pots, trawling, wetlining, and wastes from fishing activities;
- the particular need to reduce fin-fishing effort in the shallow areas; and
- the unnecessary limitations on the movements of scallop fishing boats.

The main fisheries operating in, or near, the Abrolhos are described below.

#### 8.1.1 History of Commercial Fishing in the Abrolhos

The earliest fishing known to have taken place in the Abrolhos was carried out by survivors from early Dutch shipwrecks (*Batavia* and *Zeewijk*), where other species such as seals, birds and tammar wallabies were also hunted.

During the mid-1800s, there was limited fishing for “trepane” or “beche-de-mer” in the Abrolhos, and quantities of salted fish were offered for sale. At around the same time, efforts were made to cultivate pearl shell and establish a pearl fishery in the islands, but these were commercially unsuccessful.

The commercial birth of the lobster industry is generally accepted as being in 1931, when Mr T.C. Hoskins established a small rock lobster cannery (The Cove Packing Company) on the north side of West Wallabi Island. In 1940 - 41, Sea Coast Canneries of Australia took over the operation and secured a contract for the supply of canned lobster to armed forces canteens. Sea Coast’s military contract - which exposed American servicemen stationed in Geraldton and Perth to rock lobster - had long-term consequences for the lobster industry.

The first large-scale shipments of “frozen tails” to the United States started in 1948, increasing demand, and, more importantly, the price paid for “crayfish”. As a result the WA rock lobster fishery expanded rapidly.

Unfortunately, by the end of the 1950s, there were fears that the WA rock lobster fishery would collapse through over-exploitation. This led to limited entry access restrictions being introduced to the fishery in 1963.

Since then, the Abrolhos rock lobster fishing fleet has developed along two major lines: the small boat (now predominantly jet-boat) shallow water fishers, and the larger, more mobile, deep water fishing boats.

### 8.1.2 Commercial Fisheries Operating in the Abrolhos

#### 8.1.2.1 Western Rock Lobster

The major fishery at the Abrolhos Islands is for the western rock lobster (*Panulirus cygnus*). It occurs on most of the continental shelf area of WA's west coast and is Australia's most valuable single species commercial fishery, with an average landed value of \$300 million annually.

In contrast to most of the species' range, rock lobsters at the Abrolhos reach reproductive maturity before they reach the minimum legal length. As a result of this, the contribution from the Abrolhos rock lobsters to the breeding output of the overall western rock lobster stock far outweighs the relative proportion of the Abrolhos stock.

It has been estimated that 50 - 80% of the western rock lobster spawning output comes from the Abrolhos (Dr C. Chubb, pers. comm. 1991). Conservation of the Abrolhos rock lobster habitat and breeding stocks are thus of vital importance to the entire fishery.

For the purposes of the *Fish Resources Management Act 1994* and its associated regulations, the Abrolhos is classed as a separate fishing area - Zone A - in WA's West Coast Rock Lobster Managed Fishery. It is a limited entry fishery where only licensees with Zone A authorisation are able to fish. There are currently 149 boats with Zone A concession, with an allocation of 16,478 pots at the end of June 1996.

The rock lobster season in the Abrolhos is from 15 March to 30 June. During the season most fishers operate from camps on the Abrolhos. Twenty-two islands are occupied: eleven in Southern Group; five in Easter Group; five in Wallabi Group; and North Island. In 1995, the Abrolhos Islands Regulations were proclaimed, to assist Fisheries WA and Zone A rock lobster fishers in managing the islands.

The exploitation of rock lobsters by commercial and recreational fishers is undertaken in accordance with strict provisions imposed under the West Coast Rock Lobster Managed Fishery.

The permissible level of exploitation is determined each year, after consideration of data which provides an accurate estimate of the size of the western rock lobster population and the proportion of animals which have reached legal size. This work is undertaken on a State-wide basis, considering the populations in each zone.

Therefore, it is not appropriate for the Abrolhos management plan to contain strategies to manage the exploitation of the western rock lobster species.

There is substantial infrastructure to support the rock lobster industry at the Abrolhos. On the 22 islands occupied by fishers, there are approximately 1,200 separate structures, including community facilities, accommodation, storage, engine and freezer sheds. There are 114 separate jetties, 238 landings or T-piece sections, and 43 dinghy jetties.

Other commercial fishers operating in the Abrolhos are not permitted to establish camps.

#### 8.1.2.2 Southern Saucer Scallops

The second most important commercial fishery at the Abrolhos in terms of economic value is the saucer scallop (*Amusium balloti*) fishery. Scallops are short-lived, benthic, filter-feeding bivalve molluscs, which live on sandy bottoms and are subject to great natural fluctuations in reproductive success from year to year. The major area fished for scallops in the Abrolhos is the sandy sea bottom between the various island groups.

The major fishery for saucer scallops in WA is in Shark Bay and the Abrolhos is second in importance. Scallops are found in suitable habitats all down the west coast, but these habitats are patchy and the abundance of scallops in them is variable. The various local populations are very likely to be linked by larval transport.

The Abrolhos Islands and mid-west trawl fishery both contribute to WA's scallop catch. The annual catch in these two fisheries has varied from 10 to 500 tonnes in the last 15 years.

Catches in the Abrolhos scallop fishery fluctuate markedly. For example, the fishery declined from 219 tonnes in 1984 to 10 tonnes in 1985. In 1994, the scallop fishery produced 150 tonnes, valued at \$3 million.

The Abrolhos Islands and mid-west trawl fishery operate under input controls, with restrictions on boat numbers, types of gear, and times and areas where fishing is allowed. There is a total of 16 licences in this fishery.

### 8.1.2.3 Fin-fish

Commercial fin-fishing was a major activity in the Abrolhos during the first half of this century. However, as the lobster industry emerged, the relative importance of fin-fish declined, and it is now the third most important Abrolhos fishery.

In 1995, approximately 16 vessels working mainly from Geraldton, using drop-lining and hand-lining, obtained a large proportion of their catch from the Abrolhos. During 1995, this fishery was worth an estimated \$1 million.

The fishery targets a variety of fin-fish, largely reef species, taken by hook and line. Major species include pink snapper (*Pagrus auratus*), baldchin groper (*Choerodon rubescens*), Westralian dhufish (*Glaucosoma heptraicum*) and coral trout (*Plectropomus leopardus*).

Pink snapper is a widespread species on the west coast continental shelf, with the major part of the stock located off Shark Bay.

Coral trout is a species whose habitat is shelf-edge coral reefs. The Abrolhos Islands system is therefore the main breeding area for this species on WA's west coast.

The isolation of the Abrolhos system from other shelf-edge coral reef systems raises the high probability that its population of coral trout is genetically distinct from all other populations (Dr M. Moran, pers. comm. 1995).

The bulk of the "coral trout" taken commercially in WA is actually another species more correctly known as the bar-cheeked trout (*Plectropomus maculatus*), which is not dependent on shelf-edge coral reefs and occurs in a variety of habitats.

Baldchin groper and Westralian dhufish have a lower dependence on the Abrolhos reef system than coral trout, but it is likely that the Abrolhos populations of these fish are an important component of the breeding stock. These resident reef fish species are heavily targeted by both commercial and recreational fishers, and there is a high level of public concern that they are diminishing in numbers.

If numbers of baldchin groper, coral trout and Westralian dhufish are falling, this may affect the ecological balance of the marine ecosystem at the Abrolhos. Although evidence is mostly anecdotal, strong management measures are needed.

To this end, commercial and recreational fishers need to share a commitment to these management measures, for the sake of the long-term viability of these important fish populations.

A research program on baldchin groper in the Easter and Wallabi Groups is being conducted by Fisheries WA. Baldchin groper are being studied to determine growth rates, reproductive biology and population density.

Baldchin groper are thought to change sex from female to male, at an age of about four years and a length of 40cm. A second component of this study is an investigation into the success of the Reef Observation Areas in Easter and Wallabi Groups as a management tool for restoring local populations of baldchin groper and coral trout (K. Nardi, pers. comm. 1995).

### 8.1.2.4 Proposal for Closing Shallows to Commercial Line Fishing

Many public submissions expressed concern about the overall level of exploitation of fin-fish in the waters of the Abrolhos. In addition, there is considerable concern about the pressure on fish stocks in nearshore Abrolhos waters.

The Geraldton Abrolhos Wetliners Association expressed a willingness to surrender their entitlement to take fin-fish in areas of water less than 10 metres deep throughout the shallows surrounding the islands (see Figures 7a, b, and c ).

This measure would continue for the duration of this plan. Fin-fish stocks would be evaluated to detect changes in their population density and abundance.

If these entitlements are surrendered, they will reduce pressure on nearshore stocks and assist in maintaining the balance of the ecosystem. Fisheries WA will continue negotiations with the Geraldton Abrolhos Wetliners Association in relation to this possible closure.

### 8.1.2.5 Geraldton Purse Seine Developmental Fishery

This fishery targets small, schooling pelagic fish which belong to the herring (*Clupeid*) family. The dominant species caught is the tropical sardine (*Sardinella lemuru*, also known as scaly mackerel), with much smaller quantities (<5% of total) of pilchard (*Sardinops sagax*) also caught.

Three developmental fishing licenses were issued in 1991, but in recent years only two licensees have been active. The total allowable catch (TAC) for the developmental fishery is 2,700 tonnes per annum.

The boundaries of this fishery are all WA waters between 31° 00' South and 26° 30' South, outwards to 200 nautical miles from shore, but excluding the waters of Shark Bay. The fishery primarily operates in waters between the mainland (i.e., Geraldton) and approximately 114° 10' East.

Similarly, purse seining for tropical sardines does not extend very far to the south or north of Geraldton, since catches must be returned to port reasonably quickly to maintain product quality.

In previous years, there has been smaller-scale fishing for sprats (*Spratelloides spp.*) occurring closer to the Abrolhos Islands than the purse seine fishing. The exact locations of this fishing activity are not available, nor is it known if such activities currently occur.

Fishing for sprats uses “lift nets” to catch these small fish, after they have been attracted to a fishing boat at night by the use of lights. This method of fishing has traditionally resulted in relatively small catches, possibly the reason why fishing for sprats seems to be limited and infrequent.

The potential for an increase in sprat fishing is unknown. As there is potential for sprat fishing to impact on the food available to migratory seabird populations at the Abrolhos Islands, it is important this relationship is quantified, with a view to including the conservation of seabirds as a component of the future management of the fishery.

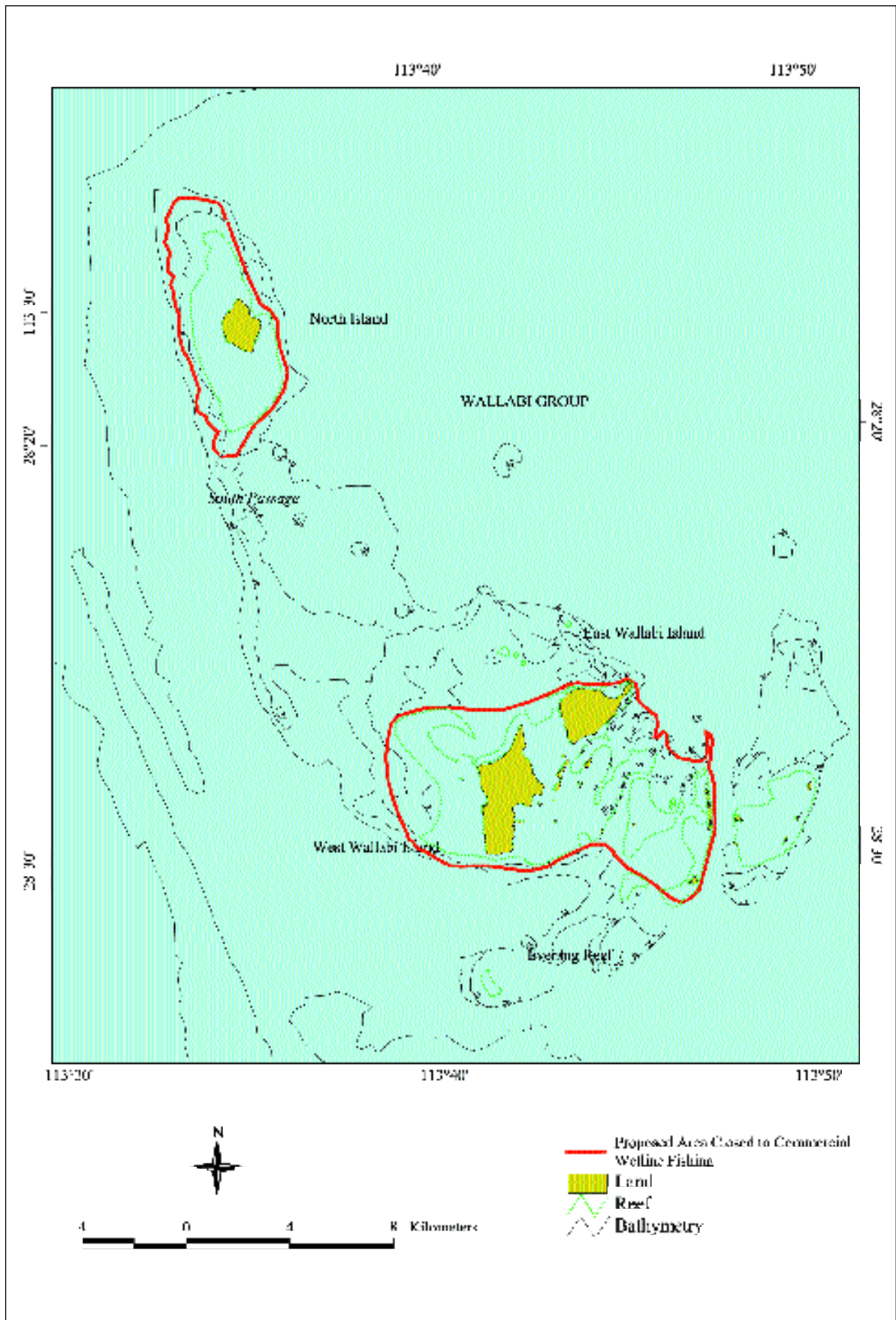


Figure 7a: North Island and Wallabi Group: Proposed Area Closed to Commercial Wetline Fishing.

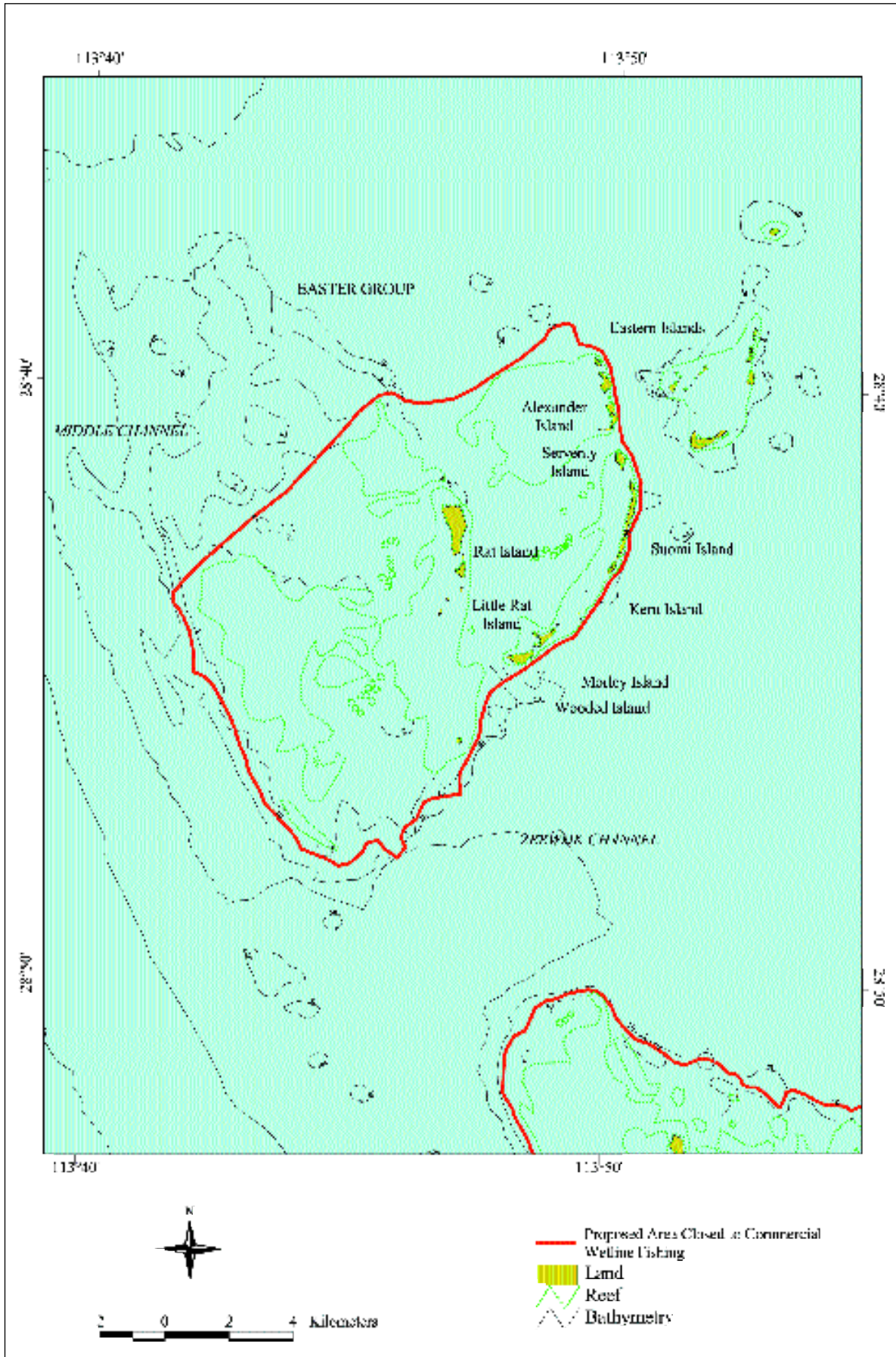


Figure 7b: Easter Group: Proposed Area Closed to Commercial Wetline Fishing.



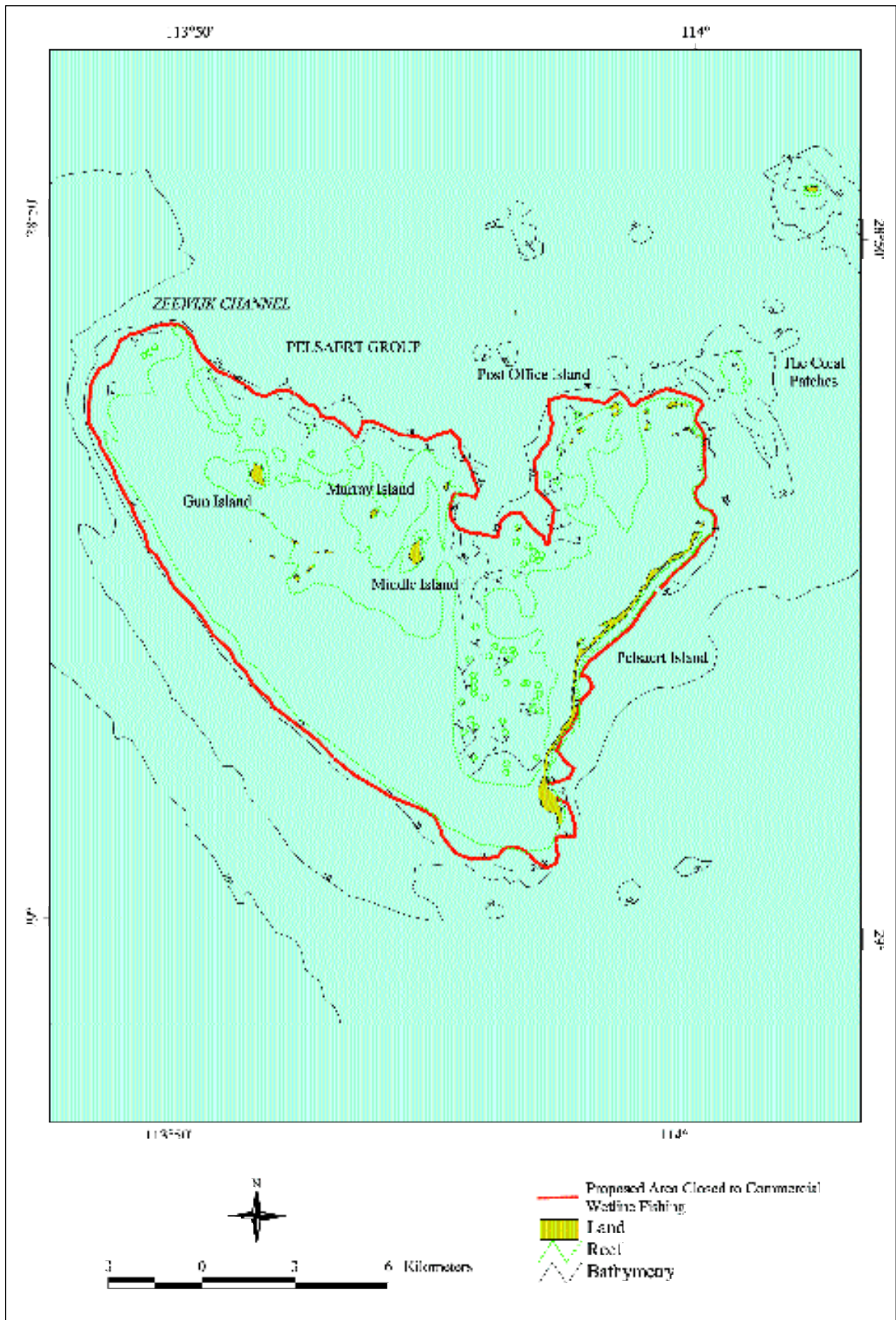


Figure 7c: Pelsaert Group: Proposed Area Closed to Commercial Wetline Fishing.

### 8.1.2.6 Aquaculture

The State Government has recently initiated a major program of developing aquaculture throughout the State to provide an additional industry and source of high quality food for the local and export markets. The clean, pristine waters of the Abrolhos offer a potential for development of aquaculture for a variety of high value species. Limited studies of pearl oysters have already commenced.

Development of aquaculture in the Abrolhos is consistent with the objective of using the islands for high value fisheries. However, it is apparent that some types of aquaculture operating in other parts of the world can have an adverse environmental impact. Before further aquaculture is undertaken in the Abrolhos, appropriate examination of potential impacts - both beneficial and adverse - must be undertaken. All aquaculture proposals will also be subject to the established Statewide consultative arrangements outlined in Ministerial Policy Guideline No. 8.

Land-based infrastructure for use in aquaculture projects will only be considered on islands which are already inhabited.

### 8.1.2.7 Minor Fisheries

As described above, the Abrolhos is a unique marine ecosystem, and its conservation value makes it one of WA's most important marine areas. At the same time, it is one of the most important fisheries areas in the State.

The State Territorial Waters must be managed in an environmentally sensitive way which retains conservation value, while simultaneously allowing fishing to occur at sustainable levels.

To achieve this goal, a strategy has been devised of targeting only high value species (western rock lobster, scallops, fin-fish, and aquaculture species), so the economic return from Abrolhos fisheries is maximised.

In order to protect the habitat, it is proposed that minor fisheries will not be permitted to operate in the Abrolhos in the future. These fisheries specifically include, but are not limited to, aquarium fish, beche-de-mer, specimen shells, and coral collection.

## Strategies

### *Immediate*

- 70. Survey waters to determine appropriate areas for scallop trawling. Exclude scallop trawling from all areas, except those with sandy or muddy sediments. (FWA)*
- 71. Permit scallop trawlers to travel through closed areas to trawl within the waters of the Abrolhos, with nets hauled into their rigging and otter boards and stabilisers at the end of their booms. (FWA)*
- 72. Initiate a study into the possible effects of the Mid-West WA Coast Purse Seine Fishery on seabirds nesting at the Abrolhos. (FWA)*
- 73. Negotiate with licensed operators to prohibit commercial wetline fishing within marine habitats bordered by West Reef and eastern island chains or margins of the Abrolhos Groups, including the shallows surrounding North Island (see Figures 7a, 7b and 7c in this document). The depth of water in these areas is generally ten metres or less. This management measure will be in place for the duration of this plan. (FWA)*
- 74. Negotiate with licensed operators and prohibit commercial shell collecting, coral collecting and beche-de-mer fishing in the waters. (FWA)*

75. Undertake surveys of all marine habitats to determine the environmental impact of fishing and boating operations, and prepare strategies to manage unacceptable impacts. (FWA)
76. Non-endemic species to the Abrolhos Islands will not be considered for aquaculture purposes. (FWA)
77. Aquaculture proposals that require the input of food will not be considered until a high level of environmental review is undertaken to investigate the potential effects of localised nutrient dispersal. (FWA)
78. Aquaculture proposals for endemic filter feeders will require an environmental review prior to establishment. (FWA)
79. Identify suitable areas within each Abrolhos Islands Group where filter feeding aquaculture projects may be established. (FWA)
80. Develop an aquaculture plan for the Abrolhos Islands. (FWA)

#### Ongoing

81. Limit commercial fishing in the Abrolhos System to a small number of high value fisheries, namely western rock lobster, scallops, fin-fish and aquaculture. (FWA)
82. Commercial fisheries are managed to ensure sustainable yields throughout the State. Fisheries in the Abrolhos will continue to be managed in accordance with Fishery Management Plans for the target species. (FWA)
83. Specific management approaches will be applied to fisheries operating in the Abrolhos, as appropriate. (FWA)

## 8.2 Mining and Petroleum Exploration

### 8.2.1 Mining

In referring to Fish Habitat Protection Areas, Section 114 of the *Fish Resources Management Act 1994* states:

“Nothing in this Division affects, or is to be taken to derogate from, the operation of the *Mining Act 1978* (WA), the *Petroleum Act 1967* (WA), the *Petroleum (Submerged Lands) Act (1982)*, any other Act relating to minerals or petroleum, or any government agreement as defined in the *Government Agreements Act 1979* (WA).”

In essence, this section means that mining and petroleum exploration can occur in the Abrolhos. However, any proposals for undertaking mining or petroleum exploration would require scrutiny under the *Environmental Protection Act 1986*.

In view of the environmental values of the Abrolhos, it would be expected that such scrutiny would be thorough before any such activity progressed.

There are deposits of limestone, sand and coral rubble on some of the islands but these are presently of little economic value.

### 8.2.2 Petroleum Exploration

In 1968, the sole onshore well at the Abrolhos Islands was drilled for stratigraphic purposes at Gun Island. Ten years later three offshore wells were drilled in the vicinity of the islands, Houtman No.1 to the north-west and Batavia No. 1 and Geelvink No. 1a to the south-east. Oil and gas shows were present in the Houtman well, but were not considered commercial at the time.

The public consultation process identified oil exploration and development as a major area of public concern and the Abrolhos Islands are classified as environmentally significant areas with reference to offshore petroleum exploration, production and transportation. Currently there are no exploration permits covering the islands or the surrounding waters but there is no embargo on their creation. However, a Memorandum of Understanding outlining the consultative procedures for mining tenements in marine environments of Western Australia is close to being completed for agreement between the Environmental Protection Authority (EPA) and the Department of Minerals and Energy (DOME). For Fish Habitat Protection Areas the procedures will involve considerable consultation with Fisheries WA and the recommendation of the Minister for Fisheries.

The Abrolhos System is classified as an environmentally sensitive locality with respect to petroleum exploration, development and transportation. The islands are surrounded by an 8km inner protection zone and an outer 42km special condition zone (Figure 3). Currently there are no exploration permits covering the islands or surrounding waters but there is no impediment to their creation.

### Strategies

#### *Ongoing*

- 84. Liaise closely with the EPA and DOME about exploration or development proposals for the area, and contribute to the assessment process. (FWA).*
- 85. Ensure the public is fully informed about all proposals. (EPA, DOME, FWA)*

### 8.3 Other Extractive Industries

Guano (seabird droppings used for superphosphate) was mined on a number of islands in the Abrolhos for about 100 years, but the last activity ceased in 1946.

### Strategies

#### *Ongoing*

- 86. Monitor proposals to develop extractive industries in the Abrolhos System and ensure all proposals are carefully assessed by the EPA. (FWA)*

## Section 9

## Development of Facilities

### Objective

*Develop policies, standards and guidelines for developments in the aquatic environment which will assist in the safe use of the area while minimising their environmental effects and ensure that visitors to the Abrolhos have access to appropriate facilities, such as anchorages, moorings and other facilities.*

### 9.1 Structures

In the past, numerous structures have been developed in the waters of the Abrolhos. These structures have included jetties, moorings and pontoons for holding rock lobsters.

The need for these structures will continue and other structures, including accommodation pontoons, may be required to enable human activities.

Initially, no construction standards existed and structures have not always been of a high standard. Since 1995, regulations prepared pursuant to the *Fish Resources Management Act 1994* have been used to raise standards. With increasing public use of the area, all structures must be built and maintained to safety standards, which are being developed.

Any development can adversely impact on the aquatic environment, and construction guidelines are required to avoid damage.

All new structures will be designed and built in accordance with policies and guidelines to maintain standards and protect the environment. Existing structures will be brought up to an acceptable standard, within agreed time frames.

### Strategies

#### *Immediate*

*87. Prepare policies, standards and guidelines for all new structures, which meet acceptable standards and avoid environmental loss. (AIMAC, FWA)*

*88. Prepare lease agreements for all structures. (AIMAC, FWA)*

#### *Ongoing*

*89. Enforce existing regulations to ensure minimum standards are maintained. (FWA)*

### 9.2 Moorings and Jetties

#### 9.2.1 Moorings

Moorings are one of the most controversial aspects of management of the Abrolhos System. The interconnected system of shallow reefs and deep, sandy environments makes the use of anchors unsafe in many areas.

Boats at anchor can swing about, as the wind changes in direction and speed. A boat dragging its anchor(s) can cause considerable damage to corals and other marine life, and in extreme situations the boat might run aground. Safe, well-maintained moorings provide an answer to this problem.

Continuing improvement of public access to the Abrolhos and future development of the tourism industry will be dependent upon the development and maintenance of some basic public capital facilities, including moorings and jetties.

Permanent moorings are required at popular diving sites, so that visitors can secure their craft without the need to drop anchors in sensitive marine environments, including coral and sea grass communities. Experience in the Great Barrier Reef Marine Park and more heavily-used parts of the metropolitan coast indicates that anchors and diving activities can cause degradation of these systems. This degradation can be minimised by the development of public moorings, designed and located to avoid damage.

Public facilities of this nature must be constructed to proper engineering standards, and regularly inspected and maintained to ensure they are safe for everyday use. Public liability insurance may also be appropriate.

A charge for the use of such facilities would be imposed to assist in defraying the cost of their construction and maintenance.

The development of moorings also raises substantial legal questions. If the mooring is installed, the individual or organisation installing it may incur legal liability for its safe operation, and may be penalised if the mooring fails and a boat grounds.

In addition, there are problems of assuring that a vessel uses a mooring properly; a mooring intended for a 15-metre boat may serve very well for that purpose, but be totally inadequate for a 30-metre vessel.

There is also the question of who has a right to install and operate a mooring, which implies access to the islands that other people without a mooring do not have. A permit system will be developed to regulate the installation, use and ownership of moorings.

As a matter of urgency, AIMAC will investigate the question of appropriate locations and operations of moorings in the Abrolhos, in close consultation with the Department of Transport.

### 9.2.2 Jetties

At present all of the jetties in the Abrolhos are operated by individual fishers or groups of fishers for purposes associated with the rock lobster industry. These are privately owned and are operated under the Abrolhos Islands Regulations.

There are no public facilities in the Abrolhos and there may be a need for public jetties at locations where visitors may wish to come ashore from boats. These sites include historic sites, airstrips and other public facilities including the proposed education centre.

## Strategies

### *Immediate*

- 90. Develop a mooring register and investigate the question of the appropriate location and operation of public moorings in the Abrolhos. (FWA, DOT)*
- 91. Develop criteria for the development and operation of public jetties. (FWA, DOT)*
- 92. Identify sites for the development of public moorings and jetties in consultation with user groups and seek funding for their development. (AIMAC, FWA)*
- 93. Inspect and maintain all public moorings and jetties that are developed, to ensure they remain safe for public use. (FWA).*

### 9.3 Navigational Aids

Navigational aids in the Abrolhos are all informal arrangements, installed by fishers to assist themselves in navigating within the island groups. The aids are non-standard and mean little to people lacking in local knowledge.

Consistent with resources being available, a program will be initiated to determine what navigational aids are necessary in the Abrolhos, where they should be located, and the arrangement of their subsequent installation.

#### Strategies

##### *Immediate*

*94. Determine what navigational aids are necessary in the Abrolhos, where they should be located, and install appropriate aids. (FWA, DOT)*

### 9.4 Fish Attraction Devices

There are no fish attraction devices (FAD) within the Abrolhos Island System at present, nor are any proposals outstanding. In view of the abundance and diversity of fish in the islands, it is unlikely that any are required. However, if a proposal is made for a FAD, it will be considered in relation to the other aspects of the management plan, particularly environmental considerations.





## Section 10 Information, Interpretation and Public Involvement

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### Objective

*Raise awareness and understanding of the Abrolhos; enlist wide community involvement for management of the islands; and ensure the safety of visitors.*

Every year the rich colourful fish life, unique coral reef formations, bird life, shipwrecks and the wild beauty of the Abrolhos are attracting an increasing number of visitors. These visitors need information and educational assistance in order to make the most of the Abrolhos, without damaging the pristine environment, flora and fauna.

### 10.1 Abrolhos Islands Communication Plan

An Abrolhos Islands Communication Plan has been developed. The plan stresses the conservation values of the Abrolhos; introduces the regulations governing visitors to the islands (and the reasons behind them); and tackles safety concerns and the issue of private property in the Abrolhos.

The plan provides for:

- the development of information signs for Geraldton boat ramps (explaining the unique nature of the Abrolhos and the expected code of conduct while visiting them),
- an update of The Abrolhos Islands: a Visitors' Guide,
- supplementary resources (such as educational and promotional packages), and
- interpretative facilities (e.g., dive and walk trails) based around the Abrolhos field study centre at Beacon Island.

The plan also puts forward a series of strategies for developing partnership and sponsorship opportunities, aimed at ensuring an Abrolhos education package can be offered to teachers at minimal price, and that a book is produced on the Abrolhos which will cover its history, marine and terrestrial environments, and natural values.

It also provides for the development of a number of maps, displays, and other informative information on the Abrolhos, for use both in the islands themselves and on the mainland.

The communication plan recommends the establishment of an Abrolhos volunteer program, inviting the spouses and families of commercial fishers working on the islands to form the basis of the group. Other interested persons should be able to offer their services to the program, possibly on the mainland through the Geraldton Region Museum.

The duties of these volunteers would be similar to those of Fisheries WA's Volunteer Fisheries Liaison Officer (VFLO) program, plus carrying out interpretative activities for visiting school and tourist groups.

The focus of the VFLO program is on education. The volunteers, clearly identifiable by their bright yellow shirts and hats, promote an awareness of fishing regulations and encourage recreational fishers to adopt a strong conservation ethic.

Progress towards completing the communication strategies, and the effectiveness of each strategy in communicating identified messages and achieving objectives, will be regularly evaluated, reviewed and, if necessary, modified. Community and stake-holder surveys should be done at least annually.

The charter for community awareness and education with regard to the Abrolhos ecosystem is to increase and enhance the knowledge, understanding and appreciation by members of the public and tour operators of :

- the unique natural and heritage values of the Abrolhos;
- the potential impacts that their activities may have on the Abrolhos ecosystem;
- the management regimes for the Abrolhos, in order to ensure minimal impacts on the ecosystem and minimise conflict between users; and
- the need to adhere to the management regulations.

### **10.2 Beacon Island Education Centre**

The Abrolhos Islands Consultative Council's *Final Report on Tourism at the Abrolhos Islands* recommended: "The Beacon Island camp (Dransfield House) be used as a residence/study facility to accommodate bona-fide education and scientific groups who wish to work at the Abrolhos."

There is an opportunity for Dransfield House to accommodate interpretative material to enhance the knowledge and understanding of these groups of the Abrolhos area, including information on the historical features of the Beacon Island area associated with the Batavia story.

### **Strategies**

#### *Immediate*

- 95. Develop mechanisms for the exchange of information and ideas between stakeholders. (FWA)*
- 96. Foster the development of acceptable codes of behaviour and develop an information package for distribution to all user and interest groups. (FWA)*
- 97. Develop processes that encourage all stakeholders to participate in management activities for the area. (FWA)*

#### *Ongoing*

- 98. Implement the communication plan for the Abrolhos in cooperation with other agencies, community groups and interested individuals. (FWA)*

## Section 11

## Knowledge

### Objective

*Plan and implement an integrated program of research, survey and monitoring on the Abrolhos Islands to: increase knowledge of natural and cultural environments;*

- *ensure ecologically sustainable yields from fisheries;*
- *identify indicators of change;*
- *provide management criteria;*
- *evaluate human impacts;*
- *assess visitor use, including perceptions and experiences; and*
- *evaluate the effectiveness of management strategies.*

The rich variety of tropical, temperate and WA endemic species in the Abrolhos has long attracted the interest of marine scientists.

The first investigations of the marine environment of the Abrolhos were by Saville-Kent (1897), who compared the marine biota of the Abrolhos with the inshore coastline near Geraldton. Saville-Kent found sea surface temperatures in the Abrolhos to be about 2°C warmer than at Geraldton, and speculated that there was a southward flowing current on the offshore continental shelf that did not reach the continental mainland.

It was not until 1980 that the Leeuwin Current was formally described. Since then, there has been a considerable amount of research on the Leeuwin Current, which has clearly demonstrated its importance to the marine biogeography of the west coast of WA and its fisheries (Pearce & Walker 1991).

The Percy Sladen Trust funded expeditions to the Abrolhos in 1913 and 1915, led by W. J. Dakin, which collected a wide range of information on the marine biota of the Abrolhos. Since the 1950s, the Fisheries Department, CSIRO, Western Australian Museum, and universities in Perth have all been conducting active research programs on the marine environment of the Abrolhos.

In 1994, the Western Australian Branch of the Australian Marine Sciences Association undertook a marine biological workshop in the Abrolhos, attracting 20 scientists from WA, the eastern states and several overseas countries. The results of the workshop were recently published (Wells 1997a).

These workshop proceedings contain a brief history of marine research in the Abrolhos (Wells 1997b) and a full list of papers on the marine environment of the Abrolhos (Wells & Goldberg, 1997).

Such information is fundamental to developing our knowledge of the important natural features of the Abrolhos Islands. In developing a strategy for the management of the Abrolhos marine environment, it is essential that this diverse information be evaluated and synthesised to allow a determination of where there are gaps in the information and which have the highest priority for further research.

Research which can be applied directly to management questions will be actively encouraged through the provision of funding, use of facilities and other infrastructure, and support in funding applications.

Research which does not provide information directly applicable to management questions will also be encouraged. It must be recognised that research will often involve the removal or modification of some areas of habitat, or the taking of specimens for manipulative experiments, as a necessary part of developing scientific information. Such work will be allowed, but not unwarranted large-scale destruction of habitats and natural resources.

Research is expensive, and requires funds and skills which are not always available to AIMAC, Fisheries WA or CALM. However, there are a number of ways in which research by outside bodies and individual scientists can be encouraged, and these will be explored and developed. In particular, the possibility of establishing a research centre on Beacon Island will be evaluated, and assistance with transportation to and from, and within, the islands can be provided.

A number of islands have been inhabited by fishers for a considerable period. This presence has undeniably affected the waters around the islands, and also to some extent those uninhabited islands which are used by fishers.

A high research priority will be to develop an understanding of the effects of human usage on the Abrolhos Islands and methods for minimising these impacts.

As visits to the islands increase, there is increasing potential for inadvertent or deliberate damage. The effects of visitation will be monitored, so strategies can be developed for minimising or counteracting these effects. Information generated will also be used to improve the quality of future visits to the islands, either by the same individuals or other visitors.

The effectiveness of management strategies will be continuously monitored, to determine whether they are having the desired effects. The monitoring carried out will also provide feedback to managers, to allow them to continuously improve island management strategies.

An AIMAC research sub-committee will be established to determine research priorities, recommend particular programs, encourage funding applications to other bodies, and support research efforts as fully as possible. The research sub-committee will encourage input from researchers, organisations and individuals in its deliberations. In particular, advice will be sought from the Abrolhos Islands Land Management Sub-committee.

## Strategies

### *Immediate*

- 99. Collect and catalogue research undertaken in the Abrolhos marine environment and determine priorities for management-oriented research in the short, medium and long terms. (AIMAC)*
- 100. Develop mechanisms for encouraging research by outside bodies and individual researchers. (AIMAC)*
- 101. Promote management-oriented research into the natural values of Abrolhos waters. (AIMAC)*
- 102. Monitor the effects of increased usage of the islands to provide information which can be used to evaluate and improve management strategies. (FWA, CALM, WAM)*
- 103. Develop mechanisms which make all research findings readily available to the community. (AIMAC, FWA)*

### *Ongoing*

- 104. Encourage management-oriented research on the marine environment of the Abrolhos Islands, including the waters around both inhabited and uninhabited islands. (AIMAC)*

## Section 12

# Restricted Access to Large Ocean-Going Vessels

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International Maritime Law is administered through the International Maritime Organisation (IMO), the United Nations' specialised agency responsible for improving maritime safety and preventing pollution from ships.

Shipping is perhaps the most international of all the world's greatest industries, and one of the most dangerous. It has always been recognised that the best way of improving safety at sea is by developing international regulations that are followed by all shipping nations, and from the mid-nineteenth century onwards a number of such treaties were adopted.

But although safety remains the IMO's most important responsibility, a new problem is emerging: pollution.

The growth in the amount of oil being transported by sea and in the size of oil tankers has been a particular concern. Pollution prevention was part of the IMO's original mandate, but in the late 1960s a number of major tanker accidents resulted in further action being taken.

With respect to a major oil spill by vessels in or adjacent to the Abrolhos area, it may be opportune to investigate the declaration of the Abrolhos Islands area as a Particularly Sensitive Sea Area (PSSA), under the IMO's legislation.

This would provide a perimeter around the Abrolhos Islands area into which large ocean-going vessels would be unable to enter. The special significance of the Abrolhos warrants this form of protection.

### Strategies

#### *Ongoing*

***105. Recommend to the Australian Maritime Safety Authority (AMSA) that it investigates the process of a Particularly Sensitive Sea Area (PSSA) declaration for an area around the Abrolhos Islands. (AIMAC, FWA)***



## Section 13

## Implementation

A major key to the management plan is to ensure that it is effectively implemented. This section provides details of the mechanisms to be used for the implementation.

### 13.1 Community Liaison

#### Objective

*Develop, encourage and facilitate liaison with the community and involvement in the management of the terrestrial environment of the Abrolhos Islands.*

Throughout the consultation process, many people mentioned that successful management of the Abrolhos System would only occur through groups of people working together and public involvement in decision-making processes.

Ongoing liaison with the community, including fishers living on inhabited islands, is essential. This liaison occurs primarily through contact by members of the public with Fisheries and CALM staff working in the Abrolhos, but also through talks and the presentation of brochures, signs, and other information. People living on the islands during the western rock lobster fishing season and long-term visitors have a great deal of knowledge of management issues on the Abrolhos, and this should be fully utilised. The Abrolhos Islands Management Advisory Committee will also consult with the community in an appropriate manner as issues arise.

#### Strategies

##### Ongoing

*106. Communicate with, and seek advice regularly from the Abrolhos community, fishing industry, tourist operators and other interested parties to keep everyone informed of management practices and developments on the Abrolhos. (AIMAC, FWA, CALM)*

### 13.2 Resourcing, Surveillance and Enforcement

#### Objective

*Provide sufficient resources to enable effective management, surveillance and monitoring.*

Aside from use by the fishing community living on the islands, the Abrolhos have been largely protected from over-exploitation by their distance from land, the requirement for a large boat to make the crossing from the Australian mainland, and the lack of accommodation on the islands. Visitor numbers have increased steadily in recent years, due to greater access for the general public to larger boats and the operation of charter boats in the islands.

The expected continuation of this increase in visitors to the Abrolhos makes it imperative that effective plans are made to provide information for them, including the reasons underlying the regulations in force on the archipelago.

In recent years, there has been a substantial increase in public interest in WA in participating in voluntary interpretive programs (such as becoming volunteer guides on Rottne Island) and management of the environment (such as joining Fisheries WA's Volunteer Fisheries Liaison Officer initiative). This public willingness to help should be utilised in the Abrolhos through the formation of an associated volunteer program.

## Implementation

The same logistical problems which isolate the Abrolhos from public visits make operations in the islands by government agencies expensive. As visitor numbers increase, the demands on agency managers in the Abrolhos will increase, and the resources necessary for effective management will increase commensurately.

Because of this situation, it is essential that activities of the various agencies in the Abrolhos - particularly those of Fisheries WA, WA Museum and CALM - are coordinated. To fully utilise the presence of agency officers in the Abrolhos, training should be provided on the various management roles of departments, and appropriate officers be delegated with reciprocal enforcement powers.

Surveillance activities in the Abrolhos serve several purposes. They provide basic information on visitor usage of the islands - where visitors are going, why they want to go there, when they go, how they get there - and other basic information essential for optimal management.

The presence of officers undertaking surveillance work rewards those visitors who use the islands in an appropriate manner by minimising misuse, also providing the means to penalise those who misbehave.

The funding of management, development of standards, monitoring and research at the Abrolhos Islands will be carried out internally, through the “funder-purchaser-provider” model. This model is a mechanism that ensures funds are available for priority programs and ongoing management activities.

The monies for activities outside the scope of this plan of management will need to be provided by outside sources.

Fisheries WA needs to identify the resources (people and equipment) required to effectively manage the expected increase in use of the Abrolhos Islands by tourists. Subsequently, these resources need to be allocated to Fisheries WA.

A significant component of these resources will be capital and administrative costs associated with “user” fee collection and the management of tourist operator license conditions and tourist movements through the Abrolhos. A mechanism for managing tourist movements must be determined prior to the promotion of tourism and other recreational pursuits in the islands.

Essential to the successful future management of the area is the collection of “area access fees” from recreational visitors and commercial tourist operators.

Fees envisaged include:

- 1) Area access fees: a fee for all visitors to the Abrolhos Islands and their State Territorial Waters.
- 2) If the fly/boat visitor concept is to continue as a preferred method of transporting visitors to the Abrolhos, a “movement charge” per head for airstrip maintenance is to be levied, and the money raised forwarded to the authority responsible for Abrolhos Islands airstrip maintenance. This movement charge is applicable to all users of the three airstrips located on North Island, East Wallabi Island and Rat Island.
- 3) Performance-based contracts with bonds from tourist operators for performance attainment will be levied, commensurate with the specific tourist operation. Satisfactory performance will be assessed against compliance to management rules and regulations, provision of specific sound data to the management agency, and collection of visitor fees and their subsequent conveyance to the management agency.
- 4) A license to operate (permit) for an island-based tourist site and any moored accommodation facility will ensure a period of exclusivity for the successful proponents. The fees for this permit will be negotiated with the successful operators and are payable to Fisheries WA.



Applicants will be required to submit a business plan with an application for a tourist development. The approval of the application will be dependent upon the milestones in the business plan being implemented.

5) Commercial fishers will be subject to fees for tenure of their island-associated infrastructure.

The provision of resources (staff and equipment) and running costs of managing the expected increase in tourism in the Abrolhos Islands need to be identified and subsequently allocated to Fisheries WA. Initial mechanisms and programs that need development and ongoing monitoring of their effectiveness include:

- 1) the administration of resources associated with fee collection and license/permit conditions;
- 2) an operational mechanism for managing tourist movements through the Abrolhos Islands; and
- 3) the provision of educational material, including signage and brochures, and an increased management presence to oversee the sustainability of the Abrolhos ecosystem and its resources.

The principal beneficiaries of this increased management presence specifically targeting tourism are the tourist operators and the tourists themselves. It is therefore appropriate that they subsidise the costs for this increased management presence.

## Strategies

### *Immediate*

*107. Provide information to visitors on the values of the marine habitats of the Abrolhos Islands, their wise use and applicable regulations. (AIMAC, FWA)*

*108. Ensure government officers have appropriate authority to undertake enforcement activities. (FWA, CALM, WAM, DOT)*

*109. Facilitate reciprocal functions by officers of different government departments through the provision of appropriate training. (FWA, CALM, WAM, DOT)*

*110. Establish a Volunteer Fisheries Liaison Officer program. (AIMAC, AILMSC, FWA)*

### *Ongoing*

*111. Review options and seek resources for implementing the management plan, including appropriate external sources and licence fees. (AIMAC, FWA)*

*112. Ensure surveillance activities are coordinated between Fisheries WA, WAM, CALM and other government agencies. (FWA, WAM, CALM)*

## 13.3 Safety

### Objective

*Ensure safety of all people at the Abrolhos Islands.*

The major safety issues in the Abrolhos are those created by boating and other activities in the marine environment, or related to the inhabited islands. Formal trails to island sites visited by people will be established, to ensure the safety of visitors and protect the environment.

Search and rescue operations are most likely to occur if a boat and its occupants become stranded on one of the islands.

The Abrolhos System is situated in remote and dangerous waters which should only be accessed by appropriate craft, manned by competent crews. In addition, the reefs, shoals and currents in the area make safe navigation difficult.

Commercial fishers operating in the area use appropriately designed and equipped vessels with trained crews, but accidents still occur. Recreational visitors using the area have variable marine skills and sometimes use craft inappropriate for use in the conditions which prevail at the islands. This issue will increase in magnitude as the number of visitors grows.

There will be an increasing need for educational programs and the implementation of strict marine regulations if accidents at sea are to be minimised.

Furthermore, Fisheries WA has obligations under Occupational Health, Safety and Welfare regulations to ensure staff at the Abrolhos Islands operate in as safe an environment as practicable.

### Strategies

#### *Ongoing*

*113. Provide information to the public on safety while on the islands. (AIMAC, FWA, DOT)*

*114. Assist the Police and Department of Transport in search and rescue operations on the islands. (FWA)*

*115. Abide by the Occupational Health, Safety and Welfare regulations while operating at the Abrolhos Islands. (FWA)*

### 13.4 Plan Implementation and Review

#### Objective

*To implement strategies for management on a priority basis and review the plan regularly.*

This management plan provides a broad range of strategies for obtaining “best practice” management of the Abrolhos System. It depends on the availability of adequate resources to be effective.

Priorities are to be established in case the available resources are inadequate to implement all of the strategies. Note that a summary of all the strategies can be found in the preface of this document.

Strategies are categorised as either ***Ongoing*** (already implemented, or implemented as required); and ***Immediate*** (likely to be implemented during the first five-year management plan). These categories are to be an indication of current priorities, but these may change (as necessary) during the first five-year management plan.

After the management plan is finalised, an implementation plan will be developed to schedule and put it into effect.

The implementation plan will be reviewed annually; strategies which have been implemented will be identified; new information affecting management regimes assessed, and the implementation plan modified as necessary.

The Abrolhos Islands Management Advisory Committee (AIMAC) has the responsibility of advising the Minister for Fisheries on management of the Abrolhos Islands. AIMAC will call for specific reports on management of the islands, as required.

This plan will come into effect for five years from the date it receives Ministerial approval, and remain in effect until the plan for the subsequent five years is approved. Amendments to the plan can occur during the five years, but only after they undergo a mandatory public consultation process.

The five year review of the plan will evaluate:

- the extent to which management objectives have been achieved and strategies implemented;
- the reasons as to why objectives have not been achieved or strategies not implemented;
- new information which affects management strategies; and
- the proposal of new management objectives and strategies to achieve them.

### **Strategies**

#### *Immediate*

*116. Prepare an implementation plan, taking account of priorities established in the management plan. (AIMAC, FWA)*

#### *Ongoing*

*117. Actively seek resources to implement this plan. (AIMAC, FWA)*

*118. Annually review the plan implementation and prepare a report on progress, and adjust management accordingly. (AIMAC, FWA)*



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*Western Australian Government Gazette No. 36 Special.*
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- Report of the Marine Parks and Reserves Selection Working Group:  
A Representative Marine Reserve System for Western Australia (1994)



# Appendix A

# SCHEDULE I

## 1.0 Plan of Management for the Houtman Abrolhos Islands Fish Habitat Protection Area

The Houtman Abrolhos Islands is one of the most interesting parts of Western Australia. The Abrolhos is a complex of low-lying islands and reefs located at the edge of the continental shelf between 28° 15' S and 29° 00' S, at a distance of approximately 60km offshore from Geraldton on the mid-west coast of the State.

There are three major groups of islands: North Island - Wallabi group; Easter group; and Pelsaert (or Southern) group, separated by the Middle and Zeewijk Channels which are each approximately 40m deep (Figure 1).

The Houtman Abrolhos Islands Fish Habitat Protection Area (Figure 2) will be established pursuant to Section 115 of the *Fish Resources Management Act 1994*.

This appendix is a separate draft plan which has been prepared to meet the requirements of Section 117 of the *Fish Resources Management Act 1994*. It contains a description of the area; outlines the purposes for which the area is to be set aside; and lists the recommendations contained in Fisheries Management Paper No. 104, *Management of the Houtman Abrolhos System*, which relate to the management of the proposed Fish Habitat Protection Area.

### **The area of waters to be encompassed by the Houtman Abrolhos Islands Fish Habitat Protection Area are:**

1. The waters of the Indian Ocean surrounding the Abrolhos Islands within those baselines described in Items 39 - 46 inclusive of Table 3 of the proclamation declared by the Governor General of Australia, made under Section 7 of the Seas and Submerged Lands Act 1973 (Cwlth) and published in the *Commonwealth of Australia Gazette No S29* on February 1983;
2. The waters of the Indian Ocean surrounding the Abrolhos Islands up to and including Mean High Water Mark (MHW) of A-Class Reserve (A20253) vested in the Minister for Fisheries for the purposes of conservation of flora and fauna, tourism and the purposes associated with the fishing industry; and
3. The waters of the Indian Ocean surrounding the Abrolhos Islands on the seaward side of the baselines, referred to in Item 1 above, which lie within three nautical miles of those baselines.

### **The purposes for which the Houtman Abrolhos Islands Fish Habitat Protection Area is to be established are:**

- a. the conservation and protection of fish, fish breeding areas, fish fossils or the aquatic ecosystem;
- b. the culture and propagation of fish and experimental purposes related to that culture and propagation; and
- c. the management of fish and activities relating to the appreciation or observation of fish.

### 2.0 Management Strategies for the Houtman Abrolhos Islands Fish Habitat Protection Area

The following management strategies for the Houtman Abrolhos Islands Fish Habitat Protection Area are listed to meet the requirements of Section 117 of the *Fish Resources Management Act 1994*.

#### Marine Conservation

##### *Immediate*

- Declare the State Territorial Waters surrounding the Abrolhos Islands as a Fish Habitat Protection Area vested with the Minister for Fisheries under the *Fish Resources Management Act 1994*. (AIMAC, FWA)

##### *Ongoing*

- Develop and implement a plan of management for the Abrolhos Islands Fish Habitat Protection Area. (AIMAC, FWA)
- Manage all activities to maintain and enhance intrinsic and ecological values of the Abrolhos. (FWA)
- Undertake research to develop an understanding of the ecology of the aquatic ecosystem and develop criteria to monitor its health. (FWA)
- Review and improve existing and proposed mechanisms for ensuring identification, protection and appropriate management of high conservation value marine areas and report on all options, including marine reserves and “no-take” areas. (AIMAC, FWA, CALM)
- Maintain and develop the cooperative relationship between AIMAC, Fisheries WA and CALM to ensure that and integrated, efficient and effective approach to planning, management and tenure continues to be implemented and, where necessary, improved. (AIMAC, FWA, CALM)

#### Marine Flora and Fauna

##### *Immediate*

- Continue to develop the present habitat maps of the marine environment of the Abrolhos. (FWA)
- Undertake surveys of the major marine habitats to determine the flora and fauna present and which species are potentially at risk. (FWA)

#### Reef Observation Areas

##### *Immediate*

- Continue the fin-fish monitoring program in the Reef Observation Areas (ROA) to determine stock levels and the effects of the ROA. (FWA)
- Increase public information about the ROA. (FWA)
- Review the boundaries of all four ROAs in the Abrolhos to accurately determine if they should be adjusted to provide better protection of the ecosystem. (FWA)

##### *Ongoing*

- Retain existing regulations which protect the ROA, but increase surveillance and enforcement (AIMAC, FWA).

## The Establishment Of Benthic Habitat Baseline Data

### *Ongoing*

- Undertake broad-scale benthic surveys of Abrolhos reefs to determine reef health, and quantify the effects of human impacts and any spatial and temporal changes to these reefs. (FWA)

## Waste Disposal

### *Immediate*

- Develop a waste management strategy to ensure that pollution caused by human activities is minimised. Among other things, the strategy should specifically result in the:
  - proper disposal of flammable wastes;
  - establishment of an appropriate monitoring program to assess the environmental impact of nutrient pollution in lagoonal waters from human activities;
  - proper disposal of liquid wastes and an associated water quality monitoring program in the vicinity of outfalls; and
  - disposal of solid wastes in a manner which meets the requirements of State and Commonwealth legislation. (AILMSC, FWA)
- Immediately implement the waste management strategies. (AILMSC, FWA)

### *Ongoing*

- AILMSC will continue to advise AIMAC on the progress of developing more efficient and environmentally acceptable waste disposal procedures at the Abrolhos. (AILMSC)

## Historic Shipwrecks and Associated Sites

### *Immediate*

Include information about the need to protect the sites in the code of conduct for visitors to the Abrolhos. (FWA)

## Tourism

### *Immediate*

- Develop a management plan for environmentally sensitive tourism at the Abrolhos, including policies and operating guidelines. (AIMAC)
- Investigate the potential of marine and land-based tourism sites, assess environmental constraints and develop rules and a code of practice for tourism development. (FWA)
- Develop application guidelines and performance criteria for venture proponents, along with a procedure to aid assessment of a proponent's proposal and ability to perform. (AIMAC)

### *Ongoing*

- Manage environmentally sensitive tourism in the Abrolhos through the development of appropriate management methods. (AIMAC)

### Recreational Fishing and Collecting

#### *Immediate*

- Continue research into the abundance of target species and catch levels in the Abrolhos. (FWA)
- Review recreational fishing regulations for the Abrolhos Islands. (FWA)
- Consider the reduction of recreational daily bag limits for Prize Fish and Reef Fish as part of the review of recreational fishing regulations. (FWA)
- Commercial rock lobster fishers taking fish recreationally for their own use should be subject to the same regulations as recreational fishers during the Abrolhos rock lobster season, within the State Territorial Waters. (FWA)
- Require recreational fishers to label their Abrolhos catch as their own. (FWA)
- Prohibit spear fishing with the use of compressed air at the Abrolhos Islands. Retain the prohibition of spear fishing in Reef Observation Areas. (FWA)
- Retain existing regulations protecting samson fish and yellow tail kingfish in anchorage areas. (FWA)
- Negotiate with the Recreational Fishing Advisory Committee and RECFISHWEST with respect to prohibiting the collection of corals, aquarium fish and shells. (FWA)
- Investigate mechanisms to monitor the success of the above strategies and any impediments to their enforcement. (FWA)

#### *Ongoing*

- Apply the *Fish Resources Management Act 1994* regulations relating to the taking of fish in Western Australia in the Abrolhos. (FWA)
- Modify the regulations relating to the taking of fish from time to time, if information available to Fisheries WA demonstrates more stringent regulations are required. (FWA)

### Diving

#### *Immediate*

- Identify sites, in consultation with the community, which are suitable for the development of dive trails and establish a priority order for their development. (FWA)
- Develop a code of conduct for dive charter operators. (FWA)

#### *Ongoing*

- Prepare information for the public about dive sites in the Abrolhos in consultation with diving clubs. (FWA)
- Incorporate recommendations on diving in the code of conduct for the Abrolhos. (FWA)
- Monitor intensity of diving in the Abrolhos, and any effects divers may be having on the environment. (FWA, dive clubs)

## Surface Water Activities

### *Ongoing*

- Provide information to visitors on the various surface water activities available in the Abrolhos. (FWA)
- Incorporate recommendations on surface water activities in the code of conduct for the Abrolhos. (FWA)
- Monitor intensity of participation levels in surface water activities in the Abrolhos, and the effects these may be having on the environment. (FWA)
- Exclude the use of personal powered watercraft except in designated areas. (FWA, DOT)

## Yacht and Power Boat Visits

### *Ongoing*

- Provide information to visitors on yachts and power boats on conditions in the Abrolhos. (FWA)
- Incorporate recommendations on yachting and other vessel visitation in the code of conduct for the Abrolhos. (FWA)
- Monitor yacht and power boat visits to the Abrolhos and the effects these may be having on the environment. (FWA)

## Commercial Fishing

### *Immediate*

- Survey waters to determine appropriate areas for scallop trawling. Exclude scallop trawling from all areas, except those with sandy or muddy sediments. (FWA)
- Permit scallop trawlers to travel through closed areas to trawl within the waters of the Abrolhos, with nets hauled into their rigging and otter boards and stabilisers at the end of their booms. (FWA)
- Initiate a study into the possible effects of the Mid-West WA Coast Purse Seine Fishery on seabirds nesting at the Abrolhos. (FWA)
- Negotiate with licensed operators to prohibit commercial wetline fishing within marine habitats bordered by West Reef and eastern island chains or margins of the Abrolhos Groups, including the shallows surrounding North Island (Figures 7a, 7b and 7c in Fisheries Management Paper No. 104). The depth of water in these areas is generally ten metres or less. This management measure will be in place for the duration of this plan. (FWA)
- Negotiate with licensed operators and prohibit commercial shell collecting, coral collecting and beche-de-mer fishing in the waters. (FWA)
- Undertake surveys of all marine habitats to determine the environmental impact of fishing and boating operations, and prepare strategies to manage unacceptable impacts. (FWA)
- Non-endemic species to the Abrolhos Islands will not be considered for aquaculture purposes. (FWA)
- Aquaculture proposals that require the input of food will not be considered until a high level of environmental review is undertaken to investigate the potential effects of localised nutrient dispersal. (FWA)
- Aquaculture proposals for endemic filter feeders will require an environmental review prior to establishment. (FWA)

## Appendix A

- Identify suitable areas within each Abrolhos Island Group where filter feeding aquaculture projects may be established. (FWA)
- Develop an aquaculture plan for the Abrolhos Islands. (FWA)

### *Ongoing*

- Limit commercial fishing in the Abrolhos System to a small number of high value fisheries, namely western rock lobster, scallops, fin-fish and aquaculture. (FWA)
- Commercial fisheries are managed to ensure sustainable yields throughout the State. Fisheries in the Abrolhos will continue to be managed in accordance with Fishery Management Plans for the target species. (FWA)
- Specific management approaches will be applied to fisheries operating in the Abrolhos, as appropriate. (FWA)

## **Mining and Petroleum Exploration**

### *Ongoing*

- Liaise closely with the EPA and DOME about exploration or development proposals for the area and contribute to the assessment process. (FWA).
- Ensure the public is fully informed about all proposals. (EPA, DOME, FWA)

## **Other Extractive Industries**

### *Ongoing*

- Monitor proposals to develop extractive industries in the Abrolhos System, and ensure all proposals are carefully assessed by the EPA. (FWA)

## **Moorings and Jetties**

### *Immediate*

- Develop a mooring register and investigate the question of the appropriate locations and operations of public moorings in the Abrolhos. (FWA, DOT)
- Develop criteria for the development and operation of public jetties. (FWA, DOT)
- Identify sites for the development of public moorings and jetties in consultation with user groups and seek funding for their development. (AIMAC, FWA).
- Inspect and maintain all public moorings and jetties which are to be developed, to ensure they remain safe for public use. (FWA)

## **Navigational Aids**

- Determine what navigational aids are necessary in the Abrolhos, where they should be located, and install appropriate aids. (FWA, DOT)

## **Information, Interpretation and Public Involvement**

### *Immediate*

- Develop mechanisms for the exchange of information and ideas between stakeholders. (FWA)
- Foster the development of acceptable codes of behaviour and develop an information package for distribution to all user and interest groups. (FWA)

- Develop processes that encourage all stakeholders to participate in management activities for the area. (FWA)

#### *Ongoing*

- Implement the communication plan for the Abrolhos in cooperation with other agencies, community groups and interested individuals. (FWA)

### **Knowledge**

#### *Immediate*

- Collect and catalogue research undertaken in the Abrolhos marine environment and determine priorities for management-oriented research in the short, medium and long terms. (AIMAC)
- Develop mechanisms for encouraging research by outside bodies and individual researchers. (AIMAC)
- Promote management-oriented research into the natural values of Abrolhos waters. (AIMAC)
- Monitor the effects of increased usage of the islands to provide information which can be used to evaluate and improve management strategies. (FWA, CALM, WAM)
- Develop mechanisms which make all research findings readily available to the community. (AIMAC, FWA)

#### *Ongoing*

- Encourage management-oriented research on the marine environment of the Abrolhos Islands, including the waters around both inhabited and uninhabited islands. (AIMAC)

### **Restricted Access to Large-Ocean Going Vessels**

#### *Ongoing*

- Recommend to the Australian Maritime Safety Authority (AMSA) that it investigates the process of a Particularly Sensitive Sea Area (PSSA) declaration for an area around the Abrolhos Islands. (AIMAC, FWA)

### **Community Liaison**

#### *Ongoing*

- Communicate with, and seek advice regularly from the Abrolhos community, fishing industry, tourist operators and other interested parties to keep everyone informed of management practices and developments on the Abrolhos. (AIMAC, FWA, CALM)

### **Resourcing, Surveillance and Enforcement**

#### *Immediate*

- Provide information to visitors on the values of the marine habitats of the Abrolhos Islands, their wise use, and applicable regulations. (AIMAC, FWA)
- Ensure government officers have appropriate authority to undertake enforcement activities. (FWA, CALM, WAM, DOT)
- Facilitate reciprocal functions by officers of different government departments through the provision of appropriate training. (FWA, CALM, WAM, DOT)
- Establish a Volunteer Fisheries Liaison Officer program. (AIMAC, AILMSC, FWA)

### *Ongoing*

- Review options and seek resources for implementing the management plan, including appropriate external sources and licence fees. (AIMAC, FWA)
- Ensure surveillance activities are coordinated between Fisheries WA, WAM, CALM and other government agencies. (FWA, WAM, CALM)

### **Safety**

#### *Ongoing*

- Provide information to the public on safety while on the islands. (AIMAC, FWA, DOT)
- Assist the Police and Department of Transport in search and rescue operations on the islands. (FWA)
- Abide by the Occupational Health, Safety and Welfare regulations while operating at the Abrolhos Islands. (FWA)

### **Plan Implementation and Review**

#### *Immediate*

- Prepare an implementation plan, taking account of priorities established in the management plan. (AIMAC, FWA)

#### *Ongoing*

- Actively seek resources to implement this plan. (AIMAC, FWA)
- Annually review the plan implementation and prepare a report on progress, and adjust management accordingly. (AIMAC, FWA)