MANAGEMENT OF THE HOUTMAN ABROLHOS SYSTEM

A DRAFT REVIEW 2007 - 2017

Prepared on behalf of the Minister for Fisheries by the Department of Fisheries (Western Australia) on advice from the Abrolhos Islands Management Advisory Committee

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OPPORTUNITY TO COMMENT

This paper was prepared on behalf of the Minister for Fisheries by the Department of Fisheries (Western Australia) on advice from the Abrolhos Islands Management Advisory Committee.

Comments about this discussion paper are sought from all stakeholders, including commercial and recreational industry members, relevant community interest groups, government agencies and interested members of the public.

Once the public comments received on this draft paper have been considered, the Minister will make a decision on the most appropriate measures to ensure the continued protection of the Houtman Abrolhos System.

Although specific issues have been identified, your views are sought on any or all of the matters in the document of significance to you and/or your group.

To ensure your submission is as effective as possible, please:

- Make it clear and concise.
- List your points according to the topic sections and page numbers in this paper.
- Describe briefly each topic or issue you wish to discuss.
- State whether you agree or disagree with any or all of the information within each topic, or just what is of specific interest to you. Clearly state your reasons, particularly if you disagree, and give sources of information where possible.
- Suggest alternatives to address any issues that you disagree with.

Your comments would be appreciated by close of business (5pm) Friday, 18 May 2007 and should be marked to the attention of the Executive Officer, Abrolhos Islands Management Advisory Committee, and addressed to:

Executive Officer, AIMAC
Department of Fisheries
PO Box 1171
GERALDTON
WA 6531

SECTION 1 INTRODUCTION

The Houtman Abrolhos (hereafter known as the "Abrolhos Islands") is a complex of islands and reefs located at the edge of the continental shelf between 28°15'S and 29°S, approximately 60 km offshore from the mid-west coast of Western Australia (Fig. 1). This island group is an extremely important component of the Western Australian environment. The "Abrolhos System" is of major significance for the conservation of flora and fauna, and is also significant in geological terms.

In addition, the adjoining State Territorial Waters, which encompass Western Australia's first Fish Habitat Protection Area, contain some of the most highly valued marine systems in the State. These waters include the sites of some of the most important historic shipwrecks in Australia, with associated historic sites located on the islands themselves.

This review contains a brief description of the Abrolhos System and its special values. It also states the goal and principal objectives for management during the next ten years (2006-2016), along with updated strategies to achieve these objectives. The document succinctly outlines the direction for multiple use management of the Houtman Abrolhos Islands as determined by the Abrolhos Islands Management Advisory Committee (AIMAC). The Committee's role is to advise the Minister for Fisheries on management of the Abrolhos Islands and the Abrolhos Islands Fish Habitat Protection Area.

The review is an outcomes-based document, (refer Appendix 1), and as such will enable strategy implementation to be measured against the review's aim and objectives. The aim of the review is *"to conserve the environment of the Abrolhos Islands for present and future generations, as a viable ecosystem, by protecting natural diversity and cultural heritage whilst ensuring ecologically sustainable use."* The principal objectives will ensure that conservation and sustainable use and development will determine management over the next decade.

It is not the intention of AIMAC to reproduce in this review document the extensive background information, scientific literature and previous management reports provided in the previous plan of *Management of the Abrolhos System*. The strategies listed in this review are post scripted in brackets with a status term. These terms are linked to the previous strategies contained in *Management of the Abrolhos System*, Fisheries Management Paper 117, and are either termed "*ongoing, modified or new."*

Many references are available on the marine and terrestrial species, processes and environments and the cultural heritage of the Abrolhos Islands, and a comprehensive selection is listed in Section 9 for readers' convenience.

1.1 Major Management and Key Strategic Issues

The following are listed as potentially major issues, which may require focused research and management at some stage during the lifetime of this document:

- global warming and associated coral bleaching and disease;
- waste management;
- jetboat and rock lobster pot usage in the shallow coral reef areas;

- no-take areas (spatial vs. temporal options) and their compliance;
- point source nutrient eutrophication and bacterial contamination;
- commercial tourism and increased visitation trends (peak periods, vessels, aircraft and people);
- diver impacts on coral habitats;
- over-fishing of reef fish species and management of their spawning aggregations;
- Integrated Fisheries Management;
- oil exploration and mining;
- bioprospecting;
- seabird management; and
- public and private infrastructure maintenance and development.

1.2 Abrolhos Islands Governance

On behalf of the Minister for Fisheries. the Department of Fisheries manages the Abrolhos Islands and is responsible for the facilitation of whole-of-Government service delivery in the area. Major partners in service delivery are the Department of Environment and Conservation, the Western Australian Museum, Department of Planning and Infrastructure and Tourism Western Australia.
In November 1995, Cabinet resolved that the Minister for Fisheries would establish the Abrolhos Islands Management Advisory Committee (AIMAC) as the principal advisory body to the Minister. AIMAC was created under Section 42 of the *Fish Resources Management Act (1994*). Mr Peter Driscoll is the present committee Chairperson.

The role of AIMAC is to advise the Minister for Fisheries about the management of the Abrolhos Islands and the adjoining State Territorial Waters.

The Abrolhos Islands are currently defined as the Abrolhos Islands Reserve No. A20253, vested under the Western Australian *Land Administration Act 1997* with the Minister for Fisheries, for the purposes of "Conservation of Flora and Fauna, Tourism and for Purposes Associated with the Fishing Industry" with the power to licence or lease land for periods up to 21 years.

The State Territorial Waters (Figure 1) are gazetted as a Fish Habitat Protection Area (FHPA) and vested with the Minister for Fisheries under the *Fish Resources Management Act 1994*. Within the Abrolhos Islands FHPA there are four Reef Observation Areas (ROAs), one in each island group, where taking fish except rock lobster by potting, is not permitted.

1.3 *Management of the Abrolhos System* (Fisheries Management Paper 117)

In December 1998 the *Management of the Abrolhos System*, Fisheries Management Paper 117, was released as a "blueprint" for the future management of the area. The management of the Abrolhos System was a sensible and practical approach to dealing with complex issues in an area of extreme importance to Western Australia and provided a satisfactory resolution to the ongoing management debate regarding the Abrolhos System.

Moreover, the plan provided an excellent summary of the concerns of the community expressed through an extensive public consultation process and gave the community a sense of ownership and input into the successful management of this important area.

The plan also acknowledged the multiple use nature of the Abrolhos System, considering the uniqueness and importance of the System as an economic, recreational and scientific resource. It addressed and acknowledged that the long-term economic viability of wise resource use relies on the maintenance of the ecological processes of the Abrolhos System and that any development must occur in a controlled and coordinated manner, otherwise adverse environmental impacts on the System could prove irreversible with time.

A number of important and appropriate strategies to address marine and terrestrial management issues were developed and AIMAC and the Department of Fisheries identified the minimum resources required for its implementation and incorporated these as important elements of the plan.

The key strategy of the plan was to declare the State Territorial Waters surrounding the Abrolhos Islands as a FHPA. Besides being the first FHPA to be gazetted in Western Australia, the Abrolhos is an extremely important model for marine conservation and true multiple resource use in other marine areas of this State. The area is vested in the Minister for Fisheries and was gazetted under the *Fish Resources Management Act (1994)* during February 1999.

The plans also provided for:

- improved access to the Abrolhos Islands for all user and interest groups;
- a higher level of protection for the State Territorial Waters and the marine fauna and flora resident within these waters;
- well-developed communication strategies which increased opportunities for the public to become familiar with and access information on many aspects of the area including scientific research, historical information and management prescriptions for marine and terrestrial sites of interest;
- the resolution of resource sharing issues;
- a comprehensive set of new strategies to manage fin fish stocks at the Abrolhos Islands;
- increased community involvement in decision making and management of the area; and
- improved interagency co-operation to rationalise management costs and overlaps in legislative responsibilities.

1.4 Aim of the Abrolhos Islands Strategic Management Plan

With regard to fishing and conservation, the stability and sustainability of ecosystems and their populations through time are paramount. Tourism can produce both pressures and benefits to the Abrolhos Islands System, by having adverse impacts on the marine and terrestrial habitats but also increasing users' environmental awareness. Finally, shipping requires space adjacent to the Abrolhos Islands for the transport of goods and raw materials to and from Australia.

Hence, integrated management is the only balanced option available to manage the Islands' complex system. Moreover, integrated management may mitigate potential threats and the increasing demands being placed on the Abrolhos Islands System.

Management of both the marine and terrestrial environments of the Abrolhos Islands needs to be effected as a whole-of-Government approach, to ensure the availability and application of all relevant expertise and resources. The Abrolhos Islands and their surrounding State Territorial Waters have long been recognised as being of high value to the people of Western Australia. These values are described in sections 1.4.1 to 1.4.6.

1.4.1 Conservation Values

Since the visit of Captain Stokes aboard the HMS Beagle in 1840, the Abrolhos Islands have been recognised as having unique flora and fauna values.. In Stokes' subsequent publication, a number of the specimens collected from this expedition were named in honour of Stokes, including the spiny tailed skink endemic to the Abrolhos, *Egernia stokesii stokesii*.

Some of the most notable flora and fauna values to be noted are:

- a number of specific valuable vegetation types including varied communities such as mangroves, dwarf Eucalyptus oraria stands and salt lake and saltbush flats;
- three priority flora species (no Declared Rare Flora are recorded from the archipelago);
- a diverse range of vertebrates including two sub-species of reptiles and two sub-species of birds, which are endemic to the area;
- fauna species that are rare or likely to become extinct including the Abrolhos Painted Buttonquail, Lesser Noddy Tern and seabirds protected under an international agreement; and
- other specially protected fauna, e.g. the Australian Sea lion; and two species of priority listed fauna.

The State Territorial Waters (the Abrolhos Islands Fish Habitat Protection Area), surrounding theAbrolhos Islands, have a diversity of the marine communities, including unique combinations of tropical, temperate and WA endemic marine species. Tropical corals mix with temperate algae in these waters and the coral reefs of the Abrolhos System are the southernmost in the Indian Ocean.

1.4.2 Cultural Values

The Abrolhos Islands are the site of two known Dutch shipwrecks, which have important associated historic sites on the islands themselves. They are also the site of a number of more recent wrecks.

The remains on the Abrolhos Islands of a long-dead guano industry provide insights into the history of Western Australia. Additionally, a number of early shacks built by fishers on the islands demonstrate the living conditions of their era.

1.4.3 Recreational Values

The Abrolhos Islands are an area suitable for nature-based eco-tourism, including bird watching and walking. The waters, which surround the Abrolhos Islands, are used for fishing, diving, boating and other surface water activities.

1.4.4 Educational and Scientific Values

The unique assemblage of marine flora and fauna has attracted considerable, continuing scientific research. The array of bird life on the Islands is exceptional and a number of rare and endangered species of fauna also attract interest from the scientific community.

The isolation of the islands' plant and animal populations further enhances the natural values of the Abrolhos Islands.

The presence of historical wreck sites of international significance, including associated land sites, provides insights into Australia's maritime history.

The protected waters within the Abrolhos System offer outstanding opportunities for undertaking educational tours and field studies

1.4.5 Commercial Values

The Abrolhos System provides the basis of a number of important commercial fishing industries. Western rock lobster is the primary species pursued, but scallops and finfish are also targeted. There is aquaculture development in the area, most notably a black pearl industry.

Charter boats actively take tour groups to the Abrolhos Islands and there is potential for development of nature-based tourism in the islands.

1.4.6 Social Values

Fishermen have inhabited the Abrolhos Islands for over 90 years. In many instances, today's fishermen are fourth generation seasonal residents of the islands.

The Abrolhos Islands rock lobster fishermen - many having spent part of every year of their lives growing up and working there - have an affinity with the islands and their flora and fauna, and possess considerable knowledge of them. The settlements throughout the Abrolhos Islands are unique to WA and provide an insight into past and present commercial fishing operations and lifestyle.

The Abrolhos Islands have also been the destination for many seasoned recreational fishers, divers and visitors, who have a similar affinity for the area as the rock lobster fishermen.

1.5 Management Goal

To conserve the environment of the Abrolhos Islands for present and future generations, as a viable ecosystem, by protecting natural diversity and cultural heritage whilst ensuring ecologically sustainable use.

To facilitate the aforementioned management goal, the following vision and mission criteria are seen as the minimum requirements for adequate resource allocation to successfully manage the Abrolhos Islands and their surrounding State Territorial Waters for the next decade.

1.5.1 Vision

1. science/knowledge;
2. community support, participation and involvement;
3. sustainability within an Environmentally Sustainable Development framework [including allocation of resource use within and among sectors];
4. enhancement of Abrolhos Islands values;
5. international recognition of management practises; and
6. strong governance.

1.5.2 Mission

maintain and/or enhance Abrolhos Island values – environmental, cultural, social and economic;

1. hold in trust for current and future generations;
2. manage human impacts – ensure acceptability of activities, allocate use (e.g. fisheries, tourism, conservation), manage interactions (localised issues such as waste disposal);
3. community expectations, partnerships and responsibilities; and
4. gain knowledge and capacity to underpin management.

1.5.3 Primary Objectives

a) Conservation encompassing the themes of:

- protection;
- enhancement; and
- restoration and rehabilitation.

b) Sustainable use and development of the Abrolhos System.

SECTION 2 THE ABROLHOS ISLANDS MANAGEMENT ADVISORY COMMITTEE

In April 1996 the Minister for Fisheries established the Abrolhos Islands Management Advisory Committee (AIMAC).

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 the Department of Fisheries Western Australia, the Western Australian Museum and the Department of Environment and Conservation sit on AIMAC in an *ex-officio* capacity.

2.1 Terms of Reference for the 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 of 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.

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 RecFishWest.

2.2 Achievements of the AIMAC since 1996

Since AIMAC's first meeting, the Committee has been innovative in its approach to consultation with Abrolhos Islands user and interest groups, and subsequently, has achieved considerable success in fulfilling its role as an advisory committee to the Minister for Fisheries, working with State and Federal Government Departments and facilitating management for the area as per the terms of reference. AIMAC's achievements include:

- pioneering a successful consultation process with Abrolhos Islands' user and interest groups;
- production of the first management plan for the Abrolhos area;
- production of the first gazetted Aquaculture plan for the Abrolhos area;
- production of the first gazetted Tourism plan for the Abrolhos area;
- facilitated the listing of the Abrolhos reefs on register of national estate;
- successfully advised on priorities for strategy implementation from the Plan of Management for the Houtman Abrolhos System;
- supported successful funding applications, in conjunction with the Department of Fisheries for public moorings placement, coral reef health monitoring, tourism / visitor studies and underwater visual census monitoring for finfish studies into the benefit of closed areas to fishing;
- has overseen a successful Sub-committee process for land management and lease development and implementation with A-Zone rock lobster fishers and aquaculturalists;
- has overseen a successful tourism development process via the Abrolhos Islands Tourism Working Group, which recommended to the Minister for Fisheries, a land-based tourism site be considered for establishment on Long Island in the Wallabi Group;
- provided considered input into numerous aquaculture proposals for the area; and
- facilitated an investigation into the potential nomination for the Abrolhos Islands FHPA to become a declared "Particularly Sensitive Sea Area."

AIMAC continues to support the State Government's policy position on the management of the area; i.e. the Houtman Abrolhos Islands is vested in the Minister for Fisheries, while ensuring that its advice to the Minister is balanced and representative of the range of views on the Committee.

MANAGEMENT STRATEGIES

1. ***Develop mechanisms between the Department of Fisheries (WA) and other relevant organisations which detail the implementation of annual work plans to maximise Government efficiency through the coordination of responsibilities, resources, and provision of information. (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. (Ongoing)***

2.3 Inhabited Islands and Infrastructure

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. Twenty-two of the 122 islands in the Abrolhos Islands have camps. A-Zone fishers and aquaculturalists are currently implementing a lease arrangement with the Minister for Fisheries in accordance with State Government Land Policy.

Currently (2006) fishers are provided tenure by annual occupation licences as an interim measure, with leases being the preferred method of tenure. Lease arrangements are expected to be introduced for rock lobster fishers and aquaculture camps in March 2007.

Infrastructure on the Abrolhos Islands is limited to approximately 140 fishermen's camps on the inhabited Islands and Government-owned facilities such as the three gravel airstrips on Rat Island, East Wallabi Island and North Island; together with the Saville-Kent Centre on Rat Island, the jetty and public facilities servicing the airstrip on East Wallabi Island and 21 public moorings. The Department has an active Capital Works Program for environmental protection works.

2.3.1 Abrolhos Islands Land Management Sub-committee (AILMSC)

The Abrolhos Islands Land Management Sub-committee (AILMSC) was established by (AIMAC) to advise it on the management of fisher-inhabited islands. The AIMLSC 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.

At the 38th meeting of AIMAC, held on 6 and 7 November 2006, AIMAC resolved to disband the AILMSC, concomitant on the formation of a new representative council comprising the recently formed four 'Bodies Corporate'. This new stakeholder group will deal directly with the Department of Fisheries and the Minister on Abrolhos Islands land management issues affecting leased areas, and not as a sub-committee reporting to AIMAC.

AIMAC and the stakeholder group will retain a linkage via the development of a communication strategy that will promote information exchange and aim to be beneficial to both organisations.

MANAGEMENT STRATEGIES

3. ***Dissolve the Abrolhos Islands Land Management Sub-committee (AILMSC), which currently advises AIMAC on the management of island issues and advise the Minister for Fisheries that a new stakeholder group be formed, to ensure island residents are properly consulted in relation to decisions, which may affect them. (New)***
4. ***Review the Abrolhos Islands Regulations within the context of the FRMA Review 2006. (Ongoing)***
5. ***Establish sub-committees to provide quality advice to AIMAC on specific issues such as heritage and research matters as required. (Ongoing)***

2.3.2 Waste Management

Waste disposal is a serious issue at the Abrolhos, specifically concerning the discharge of untreated human waste into the marine environment and the burning of flammable material.

The AILMSC through the Western Rock Lobster Council (WRLC) is trialling modern waste management systems to determine the most appropriate treatment options. The outcomes of the trials will be discussed with the Department of Environment and Conservation and a waste management plan will be implemented.

MANAGEMENT STRATEGIES

6. ***Develop a waste management plan which produces the most appropriate environmental waste management procedures for the Abrolhos. (Modified)***
7. ***Continue to implement, monitor and review the waste management plan. (Modified)***

2.3.3 Fire and Cyclone Management

Fire is a very real threat to human life and property and also could have severe impacts on the islands and their associated flora and fauna. The communities take measures to reduce fire as a risk to the inhabited islands; however, fires from lightning strikes are a very real possibility and cannot be predicted.

Furthermore, if such a fire commenced during the "off-season" when the Abrolhos are intermittently populated, there is little anyone can do except let nature take its course.

The Abrolhos are in the path of weather moving in from the west or northwest and the low-lying islands offer little protection from the wind. Weather conditions can be highly changeable, and cold and warm fronts may reach the islands 24 or more hours ahead of weather bureau forecasts for the adjacent mid west coast.

The prevailing westerly or south-westerly swell may reach several metres in unprotected waters. Cyclones can occur at the Abrolhos Islands; however, they are infrequent.

The Abrolhos Islands Cyclone Plan requires early evacuation to Geraldton. In the event of the Bureau of Meteorology issuing a "Tropical Cyclone Watch and a Blue Alert" for the Abrolhos, being declared under the Cyclone Plan, visitors and those not directly engaged in fishing industries, should immediately return to the mainland. At the "Yellow Alert" phase, commercial fishers should cease operations and return to the mainland.

MANAGEMENT STRATEGY

8. Conduct an annual review of the community's response to the fire and cyclone management plans for the Abrolhos Islands, incorporating education and practise drills in the event of a fire and/or cyclone. (Modified)

2.3.4 Fixed Wing Airstrips and Helipads

There are three fixed wing airstrips within the Abrolhos Islands and numerous helipads. The only fixed wing airstrip available for public use is located on East Wallabi Island.

These facilities are provided for user access to the islands and medical evacuations. Regular airstrip maintenance is undertaken under contract to the State Government by resident fishers. These facilities are not accessible during adverse weather conditions and strong winds.

MANAGEMENT STRATEGIES

9. Ensure that the airstrips, helipads and associated facilities in the Abrolhos Islands are maintained at a safe and serviceable level. (Modified)

10. Develop management arrangements for the landing of rotary winged aircraft on places other than approved rotary winged landing areas. (Modified)

2.3.5 Anchorages, Moorings and Swimming Areas

Coral reefs and seagrass beds are important fish habitats. They are easily damaged by boat anchors and anchor chains, and are very slow to regenerate.

As a service to the public and to protect coral and seagrass from anchor damage, a limited number of public moorings are provided at some anchorages. Public moorings for overnight and day use are designed for vessels up to 25 m in length and up to 40 tonnes in weight.

If no public moorings are available, assess the prevailing weather conditions before deciding on an anchorage. There are no all-weather anchorages at the Abrolhos.

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

MANAGEMENT STRATEGY

11. Establish appropriate impact assessment measures for all marine structures to ensure acceptable standards are met so as to avoid environmental damage. (Modified)

2.3.6 Navigational Aids

Consistent with resources being available, a program has been completed to deploy navigational aids throughout the Abrolhos Islands.

MANAGEMENT STRATEGIES

12. ***Determine if further navigational aids are necessary in the Abrolhos Islands and where they should be located. Furthermore, these facilities will be subjected to impact assessments to minimise any potential direct and cumulative impacts on the marine environment. (Modified)***
13. ***Formulate a policy to manage the use of jet skis and regulate to limit the speed of all vessels near swimming areas, mooring areas and islands with high conservation values. (Modified)***

SECTION 3 NATURAL RESOURCE MANAGEMENT

3.1 Geological and Biogeographical Characteristics

The Houtman Abrolhos Islands have an unusual geology and fall within a zone of biogeographical overlap between the tropical north coast and temperate south coasts of Western Australia. The islands are low-lying, with a maximum height of 15m above sea level.

The geomorphological variety of the Abrolhos Islands is far greater than most other coral reef systems. Characteristic features include cellular reef morphology in the lagoons, undercut ledges in the fossil reef islands and sand dunes in the North Island-Wallabi Group, coral rubble storm ridges in the younger eastern margin islands, many of which contain enclosed tidal pools.

The variety of habitats creates numerous distinct microhabitats and thus contributes significantly to the biodiversity of the Abrolhos ecosystem.

The islands have a combination of Western Australian endemic marine species that intermingle with temperate and tropical species. The system is in the warm temperate zone and has large areas of limestone reef and sand typical of temperate Western Australian waters, while the coral reef habitat provides an appropriate environment for tropical reef species.

This unique blend of tropical and temperate species fosters unusual ecological interactions. For example, there are spectacular coral reefs in some areas, often in close association with stands of temperate algae.

3.2 The Leeuwin Current

The Abrolhos coral reefs are among the most southerly extant reefs in the Indian Ocean. They are bathed by the warm waters of the Leeuwin Current (Pearce 1991; 1997), which originates north of North West Cape.

The Leeuwin Current flows most strongly in the austral winter period, from April to October, and is weaker or absent at other times of year. The current's strength varies from year to year, depending on the state of the El Niño-Southern Oscillation.

Pearce and Phillips (1988; 1994) consider that inter-annual fluctuations in the strength of the Leeuwin Current may have implications for the recruitment of marine organisms to the Abrolhos Islands, particularly from regions further north. Sea surface temperatures vary only slightly with the seasons (mean range 19-24°C) due to the warm winter current.

3.3 Climate

The climate at the Abrolhos Islands 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.

Dominant wind direction in summer is from SE – SW, with high speeds: 76 per cent of wind speeds exceed 20 kph and 44 per cent exceed 32 kph. Calm conditions are rare and occur mainly in winter.

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

MANAGEMENT STRATEGY

14. Develop an inventory of the geological and biogeographical features of the Abrolhos System and protect priority areas. Permit only those recreational and commercial activities at these sites that are consistent with their level of protection. (Ongoing)

3.4 Marine Conservation within the Abrolhos Islands

The Abrolhos Islands' aquatic ecosystem is recognised as one of the most important marine environments in Western Australia. An FHPA was established in February 1999, 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 of the Abrolhos Islands 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 *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 definition includes the reefs themselves.

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.

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.

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 numerous species (Hutchins 1997a).

MANAGEMENT STRATEGIES

15. ***Continue to implement marine management for the Abrolhos Islands and review and improve management prescriptions. (Modified)***
16. ***Develop marine habitat mapping as a precursor to undertaking research to modify management of species and communities at risk, disease, eutrophication, fishing and tourism. (Modified)***
17. ***Seek funding to undertake regular surveys of Abrolhos reefs to determine reef health. Compare the results of these surveys with baseline studies and habitat mapping to interpret and quantify any spatial and temporal changes to reefs. (Modified)***

3.4.1 Reef Observation Areas

Within the Abrolhos Islands' FHPA (253,100 ha), four areas have been set aside as reef observation areas (ROAs) (Figure 1) for the conservation, scientific study and observation of marine life and habitats.

The four ROAs in the Abrolhos cover a total area of 6,859ha and are the:

- North Island ROA – 514 ha;
- Beacon Island ROA (Wallabi Group) – 2,744 ha;
- Leo Island ROA (Easter Group) – 2,229 ha; and
- Coral Patches ROA (Pelsaert Group) – 1,372 ha.

Catching fish by line, spear or any other method is not permitted in these areas; however, taking rock lobster by pots is permitted. The ROAs are intended to:

- conserve and protect fish, fish breeding areas, fish fossils and the aquatic ecosystems;
- provide sites for the appreciation and observation of fish in their natural habitat; and
- boost populations of reef fish in areas adjacent to the ROAs.

3.4.1.1 Long-Term Study of the Reef Observation Areas

In 1993 the Department of Fisheries commenced the first long-term, comparative study on closed fishing areas in Western Australia, using the Abrolhos Islands ROAs to examine their value in protecting vulnerable reef fish species, including the baldchin groper and the coral trout.

Prior to protection, population densities and sizes of both species were monitored at the Easter and Wallabi groups. At each location, the ROAs and the equivalent "control" areas to remain open to fishing were monitored using underwater visual census techniques.

These closed and open areas were subsequently monitored after closure four more times between 1995 and 2002, to assess long-term trends in abundance and population structure. Populations of the baldchin groper did not respond to protection; however, in contrast, there were significantly larger numbers of the coral trout in the closed areas.

There was a seven-fold increase of coral trout at the Wallabi Group and a three-fold increase in the Easter Group. Why this species should respond well to protection in some areas but not to the same magnitude in others, is not clear. One possible explanation is that the isolated area of the Abrolhos Islands may make it difficult to ensure effective compliance with closed area regulations (Nardi *et. al.* 2004).

Moreover, despite the introduction of the ROAs, commercial and recreational catches of reef fishes have increased in the Abrolhos, due to improvements in fishing technology. Formal management of the commercial line fishery is underway.

Recreational fisheries management of reef fish species is based on conservative minimum legal size limits, daily bag and trip limits and a seasonal spawning closure for the baldchin groper. Importantly, the Department may now have to consider alternative compliance mechanisms for all commercial fishing and charter vessels (Nardi *et. al.* 2005).

3.4.2 Sanctuary Zones or No-Take Areas

In Western Australia, the Department of Fisheries is responsible for meeting the objectives of the Fisheries Resources Management Act (FRMA). These objectives include: "to conserve fish and protect their environment".

Given that in this context "fish" is defined as "aquatic organisms of any species except amphibians, mammals, birds, and reptiles", these objectives cover the conservation of most of the biodiversity issues associated with marine species, such as the protection of their environment including associated food chains, and ensuring that the exploitation of these resources is undertaken in a sustainable manner throughout all Western Australian waters.

3.4.2.1 Western Australian Fisheries and Biodiversity Management Strategies

Sanctuary zones (or equivalent no-take FHPAs) are just one of a number of possible strategies that can be used to meet management objectives in the marine environment.

In Western Australia, there is a long history of using small and large-scale spatial closures of various activities to sustain fish stocks and their environment. Much of

Western Australia's coastal waters already have significant levels of protection, either by closures or controls on fishing methods that can directly affect marine habitats. In general, therefore, the fish stocks, marine habitats and biodiversity in Western Australia are highly protected from negative fishery impacts compared to nearly all other locations in the world.

There is no doubt that sanctuary zones/no-take areas can result in an increase in the local densities of some fish species (i.e. those that are not highly migratory). In Western Australia, however, there are currently no species whose stocks have been reduced to sufficiently low levels that their recruitment would significantly benefit from the increased egg production generated within a sanctuary.

Sanctuary zones could, nonetheless, play a valuable part within an overall scheme of marine management where they:

1. ensure that particular areas are managed for non-fishing/eco-tourism purposes ("no-take" uses), preferably developed as part of the overall planning process for a bioregion;

2. protect particularly vulnerable, sedentary species; and

3. establish areas of the marine landscape that provide representative sites for research and long-term monitoring including as an ecosystem reference. "

In conclusion, there is a good basis to support the establishment of marine sanctuary zones where they have clear, measurable objectives that propose achievable benefits for tourism, biodiversity and other "no-take" outcomes.

In particular, for marine organisms with limited mobility and distribution, sanctuary zones/no-take areas and management measures have an immediate conservation and biodiversity contribution, depending on species mobility and the size of the no-take area.

In contrast, for mobile species, contributions to recruitment and biodiversity protection are limited, and not necessarily supported by scientific evidence at this stage. Moreover, it is important to remember that sanctuary zones/no-take areas are not a good sole substitute for sound fisheries management. They should be viewed as a complementary option.

MANAGEMENT STRATEGIES

18. Continue the existing monitoring program, using underwater visual census techniques in the ROAs, to determine reef fish stock levels and any positive effects to surrounding waters. Analyse and report on the results, regularly. (Ongoing)

19. Investigate potential sites for sanctuary zones/no-take areas that have identified values for marine research, eco-tourism and biodiversity conservation. These areas need to be established concomitant to the provision of effective compliance. (New)

20. Once established the sanctuary zones/no-take areas will be monitored to determine their effectiveness in maintaining or improving the identified values and objectives against which they were established. (New)

21. Consider compensatory mechanisms to commercial fishers, if they can demonstrate a significant economic loss following the gazettal of a sanctuary zone or no-take area. (New)

3.4.3 Particularly Sensitive Sea Areas (PSSAs)

This project, with an aim "to delineate and declare a non-shipping zone around the Abrolhos Islands, to minimise shipping related maritime accidents in an environmentally sensitive sea area," is continuing, but in a modified form.

The Department of Fisheries has been advised that PSSA status may not be justified because:

1. ship traffic and navigational difficulty on the central WA coast is low by international standards;
2. relatively few incidents have occurred in the area; and
3. WA has not yet trialled the alternative state and national level measures that are available to protect the marine environment from shipping-related risks.

Hence the Department intends to apply for four high-value areas along the coast - the Abrolhos Islands, Shark Bay, Ningaloo Reef and the Southwest Capes - to be designated as either "Areas to be Avoided" (a national level measure) or "Marine Environment High Risk Areas" (a state level measure).

Only if these options are tested and found ineffective would a PSSA application be resumed. Consultation with the major stakeholders is continuing in an effort to provide adequate environmental protection with minimal disruption to commercial operations.

MANAGEMENT STRATEGY

22. Continue to investigate the best option, either an Area to be Avoided or a Marine Environment High Risk Area, to protect the Abrolhos Islands from shipping related risks. (Modified)

3.5 Terrestrial Flora and Fauna Management and Research

The following areas are considered priorities for the management and research of the Abrolhos Islands' unique terrestrial flora and fauna, including mammalian marine species.

3.5.1 Inventory

Basic inventory work on the reptile, bird and mammal fauna has been conducted across the archipelago and specific research undertaken into the life history and genetics of a number of species, particularly the carpet python and king skink.

Research into mammals has shown that the population of the bush rat, *Rattus fuscipes* may have become locally extinct on East Wallabi Island. Further inventory and ecological studies are required in all areas and particularly to determine the fate of the bush rat population on East Wallabi Island.

3.5.2 Monitoring

There is no systematic monitoring of the fauna or flora values of the islands. No monitoring plan has been developed and there is no specific resource allocation. The monitoring that does occur is limited in extent or to specific groups of fauna or flora.

Seabird monitoring and research has occurred on both the species scale (for example, shearwaters, ospreys and terns) and on the scale of nesting densities across the whole of the archipelago. Although a draft Abrolhos Islands Seabird Strategy has been prepared, resourcing and full-scale implementation have not occurred.

Monitoring on a limited scale is ongoing in the absence of full resourcing. The Australian sea lion population monitoring has occurred sporadically on the basis of monitoring of pupping numbers.

3.5.3 Threats to the Australian Sea Lion

The Abrolhos Islands represent the northernmost breeding population of Australian sea lions with a population of approximately 70-80 animals. It is believed that this population is greatly reduced from historical times, when as many as 500-600 animals may have been resident.

Pups are born every 17.5 months and the majority of pupping occurs in the Easter Group, with a few pups born in the Southern Group. No pups have been observed in the Wallabi Group for the past 15 years.

Whilst pup production has been relatively stable over the past 15 years, a small population of this size is extremely vulnerable to any environmental change or incidental mortality from human activities.

Recent observations of entanglement of marine debris on pup and juvenile sea lions in the Easter Group are a cause for concern, as these “necklaces” slowly choke the animals. Most pups inhabit the mangrove communities where marine debris accumulates and, due to the pups’ inquisitive nature, they play with and can become entangled with marine debris.

Other potential threats to this species include disturbance from breeding areas by tourism and incidental mortality in fishing gear. These threats can be mitigated by appropriate regulation of tourism and suitable management plans for the fisheries active in the region.

Regular clean-ups of marine debris in the breeding areas would also greatly reduce the threat to this small population of sea lions. There is no information at present on the degree of competition for food resources among sea lions and the commercial and recreational fishing activities.

3.5.4 Introduced Weeds

Introduction to East Wallabi Island of the invasive weed *Verbesina encelioides* as soil-borne seeds has illustrated the vulnerability of the islands to colonisation by exotics.

Ineffective initial management has resulted in the need for a more intensive, resource-expensive effort; however, the control program now appears to have *Verbesina* on East Wallabi Island under control, with eradication a real possibility over several years.

Similarly small infestations of Verbesina and Paterson's Curse found on North Island and Rat Island are targeted for eradication over the next several years. A lull in the eradication of another exotic, African Boxthorn occurred in the late 1990s; however, this program has now been reinstated.

3.5.5 Introduced Animals

Tammar Wallabies were introduced to North Island from the Wallabi group in the 1980s. This population has now increased to the point where monitoring shows significant grazing impacts.

A program of population control with the aim of eventual eradication has been instituted in conjunction with a research program. These introductions illustrate the necessity of the development and enforcement of an effective and stringent quarantine protocol and monitoring program to prevent establishment of further species.

MANAGEMENT STRATEGIES

23. Develop and implement a management plan for the protection of flora and fauna and their habitats, incorporating a strategic monitoring and research plan. (Modified)

24. Prepare a communication plan to highlight the fauna and flora values of the Houtman Abrolhos islands.(New)

25. Finalise and implement the draft Seabird Strategy. (New)

26. Develop and implement a strategy to map the distribution of marine wildlife including cetacean migratory pathways, cetacean milling areas, threats to the Australian sea lion population, sea lion haul-out islands, sea lion feeding areas, seabird feeding areas and seabird nesting islands. (New)

27. Undertake further research to determine the status of the bush rat population on East Wallabi Island including reasons for a decline in the population. (New)

28. Develop and implement a quarantine protocol and a monitoring program to prevent the establishment of further pest species. (Modified)

29. Implement the introduced North Island Tammar Wallaby, Verbesina, African Boxthorn and Paterson's Curse control plans. (Modified)

30. Develop and implement a strategy to monitor human usage that may impact on fauna and flora values. (Modified)

SECTION 4 HISTORIC AND HERITAGE SITES

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 Islands. The wreck of the *Batavia* and the associated land sites on Beacon Island, Long Island 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*. Several shipwrecks in the Abrolhos Islands 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).

While the Western Australian Maritime Museum has always assumed protection of the associated land sites under the *State Maritime Archaeology Act 1973*, it also appears that these sites may be protected under the Commonwealth Act.

On 6 April 2006 the Batavia Shipwreck Site and Survivors Camp Area (Figure 3 in the Section 10 of this document) was gazetted under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999,* as an Inclusion of a Place in the National Heritage List.

4.1 Other Historic Sites

Some of the rock lobster fishermen's huts in the Abrolhos may have heritage interest. No doubt this would also apply to sites associated with the remnants from the period (mid 1840s – 1920s), when guano mining occurred on several of the Abrolhos Islands, predominantly in the Southern and Easter Groups.

MANAGEMENT STRATEGY

31. In cooperation with the WAM, prepare and implement management plans and public information for the protection of historic shipwrecks, associated land sites and other sites of heritage value. (Modified)

SECTION 5 FISHERIES AND MARINE RESEARCH

To plan and implement an integrated program of research, survey and monitoring on the Abrolhos Islands, an emphasis needs to be focused on:

- an increased knowledge of natural and cultural environments;
- ecologically sustainable yields from fisheries;
- identification of indicators of change;
- provision of management criteria;
- evaluation of human impacts;
- assessment of visitor use, including perceptions and experiences; and
- ongoing evaluation of the effectiveness of all management strategies.

5.1 Scientific Historical Perspectives

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

The first investigations of the marine environment of the Abrolhos Islands were by Saville-Kent (1897), who compared the marine biota of the Abrolhos Islands with the inshore coastline near Geraldton. Saville-Kent found sea surface temperatures in the Abrolhos Islands 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.

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

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 Western Australia and its fisheries (Pearce & Walker 1991).

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

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.

5.2 Abrolhos Islands Research Institute

In 2006, the Department of Fisheries established the Abrolhos Islands Research Institute (AIRI) to enhance research efforts in the Abrolhos by the Department and other agencies. While the primary focus of the research effort will be to investigate fisheries and the marine systems that support the fisheries, there will also be research into the important terrestrial ecosystems.

AIRI will use the Saville Kent facility on Rat Island and also has a dedicated laboratory at Separation Point in Geraldton. The main objective of AIRI is to facilitate research, which can be applied directly to management questions 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 AIRI, but in cooperation with AIMAC, the Department of Fisheries and other agencies, AIRI will facilitate marine research by outside bodies, both from within and outside Western Australia.

5.3 Research and Monitoring Priorities

5.3.1 Human Usage

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 those involved in the management of the Abrolhos, to allow them to continuously improve island management strategies.

There has already been a considerable amount of work to determine the needs for management-oriented research in the Abrolhos. AIRI has analysed some of this work and determined a preliminary set of research priorities, which will be refined in consultation with stakeholders.

5.3.2 The Western Australian Marine Science Institution (WAMSI)

WAMSI is a collaborative venture funded by the Western Australian State Government with partnerships from various WA government agencies (e.g. Department of Environment and Conservation, Department of Fisheries, WA Museum and the Department of Industry and Resources), Australian Government Agencies (e.g. CSIRO, AIMS, Bureau of Meteorology) and Western Australian Universities (the University of Western Australia, Murdoch University, Edith Cowan University and Curtin University).

In addition, Woodside and BHP Billiton Petroleum are the first two industry collaborators.

WAMSI's main goals are to undertake new and innovative strategic marine science projects that will improve the understanding and management of marine resources and provide benefits for the people of Western Australia.

One of the nodes [Node 4] is tasked with assisting with the implementation of Ecosystem Based Fisheries Management (EBFM). This work will be directed towards enabling the management of the fisheries resources of WA to be undertaken at a bioregional level and therefore assist with the efficient provision of information needed to meet ongoing EPBC *(The Environment Protection and Biodiversity Conservation Act 1999)* requirements.

The first set of projects in this node will be developed by the end of the year. The Abrolhos Islands have been identified as a key site in which to undertake some of these research projects.

Specifically, the Abrolhos Islands were identified as a priority area for the assessment of community structure, biodiversity, habitat, climate change and the impact of anthropogenic influences. This assessment will involve the establishment of sites for cost-effective long term monitoring and research and for a site to develop fishery dependent measures for climate change**.**

MANAGEMENT STRATEGIES

32. Increase research into the effects of the Reef Observation Areas on populations of key finfish species and evaluate the effectiveness of the ROAs. (Modified)

33. Collect and catalogue research undertaken in the Abrolhos marine environment and determine priorities for management-oriented research, including the waters around both inhabited and uninhabited islands, in the short, medium and long terms. (Modified)

34. Support research programs of the Western Australian Marine Science Institution that will lead to better management and the sustainability of the Abrolhos Islands System. (New)

35. Make all research findings readily available to the community through the publication of general interest articles. (Ongoing)

SECTION 6 RESOURCE UTILISATION

6.1 Commercial Fishing and Aquaculture

The Abrolhos is a critical area for Western Australian fisheries. Western rock lobster fishery catches on the Abrolhos are generally about 15 per cent of the total for the industry, with a value to the fishers of approximately $45 million annually.

Additionally, there is a saucer scallop and a small wetline fishery. Eight licences have been issued for aquaculture production of black pearls.

6.1.1 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 what happens over most of the species' range, rock lobsters at the Abrolhos Islands 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 Islands stock.

It has been estimated that approximately 40 to 50 per cent of the western rock lobster spawning output comes from the Abrolhos Islands. Conservation of the Abrolhos Islands rock lobster habitat and breeding stocks is thus of vital importance to the entire fishery.

For the purposes of the *Fish Resources Management Act 1994* and its associated regulations, the Abrolhos Islands 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.

The rock lobster season in the Abrolhos Islands is from 15 March to 30 June. During the season, most fishers operate from camps on the Abrolhos Islands.

The exploitation of rock lobsters by commercial and recreational fishers is undertaken in accordance within strict provisions imposed under the West Coast Rock Lobster Managed Fishery. This fishery has specific management plans and the Rock Lobster Industry Advisory Committee (RLIAC), which advises the Minister for Fisheries. Therefore, this fishery and its complex management are outside the terms of reference for AIMAC.

6.1.2 Southern Saucer Scallops

The second most important commercial fishery at the Abrolhos Islands 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 Islands 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 Islands 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 operate under input controls, with restrictions on boat numbers, types of gear, and times and areas where fishing is allowed. There are a total of 16 licences in this fishery.

MANAGEMENT STRATEGY

36. Seek to improve the management arrangements for the scallop fishery that recognise the patchiness of scallop distribution and the year-to-year variation in abundance and interactions between the trawl fleet, the western rock lobster fishery and the marine values of the Abrolhos habitats. (New)

6.1.3 Finfish and Finfish Sustainability

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

Abrolhos Islands finfish stocks are targeted by commercial fishers and recreational users (including boat visitors, charter vessels and people residing on the islands).

This hook and line fishery targets a variety of finfish, largely reef species that are slow-growing and long-lived. Major species include pink snapper (*Pagrus auratus*, baldchin groper (*Choerodon rubescens*), Westralian dhufish (*Glaucosoma hebraicum*), red throat emperor *(Lethrinus miniatus)* and the 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 are the main population area for this species on WA's west coast.

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.

Prior to 2001, finfish in the Abrolhos have been managed as part of the state-wide system, mainly using social controls. A paper presented at the *Sharing the Fish* conference in Fremantle in early 2006 (Wells & Nardi 2006) outlined concerns over the amount of finfish being removed from the islands.

There are problems with the available commercial data in that it is based on grids of 60 nautical miles on a side, so it is impossible to differentiate what comes from the Abrolhos itself and what was caught from nearby waters outside the Abrolhos. There is also a paucity of long-term data on the known recreational catch, and this problem is being addressed through a creel survey.

The high catches reported in the paper and the preponderance of anecdotal evidence is that the finfish populations in the Abrolhos have been substantially reduced. This suggests that the Abrolhos should be managed as a separate area, with more stringent regulations than in other west coast areas. It also highlights the critical need for a better understanding of the present population status of the key finfish species in the islands.

A key issue is that, given the FHPA status, there is a need to clearly identify the management objectives, i.e. the appropriate spatial scales of management, together with related performance measures. There is also a need to prioritise the research needs, both within the context of the Abrolhos, and the broader West Coast Bioregion.

MANAGEMENT STRATEGIES

37. Establish the Abrolhos Islands as a separate zone for demersal finfish management and determine if a reduction in fin fishing effort is needed to ensure sustainability. (New)

38. Revise the Department of Fisheries data collection system so commercial catches from the Abrolhos Islands FHPA can be clearly differentiated from fish caught in adjacent waters. (New)

39. Undertake research into the population dynamics and stock status of key finfish species in the Abrolhos. (Ongoing)

40. Undertake a review of available data (catch and effort and biological) with a view to preparing and implementing specific management plans, including gear-based spatial closures, to ensure the sustainability of finfish species within the Abrolhos Islands. (Modified)

6.1.4 Northern Development Purse Seine Fishery

This fishery targets small, schooling pelagic fish, which belong to the herring family (*Clupeidae*). The dominant species caught is the tropical sardine (also known as scaly mackerel), with much smaller quantities (<five per cent of total) of pilchard also caught.

Three developmental fishing licences were issued in 1991, but in recent years only one licensee has been active. On 10 February 2003 the Minister approved drafting a number of changes for the West Coast Purse Seine Management Plan.

These changes included amalgamating the southern and northern development fisheries into the managed fishery as separate zones. The intention is that the one recognised existing northern development zone licensee will be the one licensee in the new northern zone.

6.1.5 Minor Fisheries and Coral Collection

There are a number of minor commercial fisheries licensed to operate in the waters of the Abrolhos Islands.

These fisheries specifically include but are not limited to: aquarium fish, beche-de-mer, specimen shells and coral collection. At present, levels of activity are very low.

The effort in these minor fisheries at present is no cause for concern, due to restrictions placed on operators and their equipment. Given the offshore location of the Abrolhos, concerted effort is this area is prohibitive.

The Department of Fisheries is maintaining a monitoring of activity and will report if present effort levels rise sharply and are cause for concern.

MANAGEMENT STRATEGIES

41. Finalise management guidelines for the Northern Developmental Purse Seine Fishery. (Ongoing)

42. Monitor levels of commercial shell collecting, coral collecting, aquarium fish collecting and any future beche-de-mer fishing in the waters of the Abrolhos Islands FHPA and take appropriate action if these fisheries increase their activities. (Ongoing)

6.2 Aquaculture

The clean, pristine waters of the Abrolhos Islands offer a good environment for the aquaculture of a variety of high-value species.

These species and opportunities were well canvassed in the *Aquaculture Plan for the Houtman Abrolhos Islands* published by the Department of Fisheries in 2000. The dominant aquaculture sector at Abrolhos Island is black pearl production, with eight licences currently being issued for production of these species.

In addition, a licence for a pilot sea cage finfish farm was issued in 2004. There has been no move by the licensee to exercise this licence at this stage.

There has also been interest in the production of live rock, live sand and coral culture at the Abrolhos, using natural substrates such as limestone “in situ.” Live rock, live sand and coral are used by aquarium enthusiasts to enhance the aesthetics or function of the marine aquaria they keep and enjoy and there is a large and growing market for these products.

The Department of Fisheries has produced a draft policy on the management of this emerging industry and will develop and publish a final policy in 2006. This policy will include requirements in relation to environment management and monitoring.

6.2.1 Aquaculture Governance

All aquaculture proposals are subject to the established state-wide consultative arrangements outlined in Ministerial Policy Guideline No. 8: *Assessment of application for authorisation for Aquaculture and Pearling in coastal waters of Western Australia*. Land-based infrastructure for use in aquaculture projects will only be considered on islands already inhabited.

With the recent development of the black pearl industry and establishment of the first sea cage finfish authorisation for the Abrolhos Islands, the Department commenced the drafting of a policy on the further development of aquaculture within this area. A draft policy has been developed which considered that due to restrictions on distance between black pearl farms, limitations on the available of sheltered sites for aquaculture and a necessity to collect data on finfish farming from the pilot project prior any further expansion of the finfish industry, the opportunities for growth at the Islands is now limited.

It is considered appropriate to develop a revised draft policy for public comment, leading to the development of a final policy incorporating other species of potential, and other important remnants of the *Aquaculture Plan for the Houtman Abrolhos Islands*.

MANAGEMENT STRATEGY

43. Develop a policy on aquaculture at the Abrolhos Islands incorporating other species of potential and important remnants of the Aquaculture Plan for the Houtman Abrolhos Islands. (Ongoing)

6.3 Recreational Fishing

Recreational fishing activity levels are high and are likely to increase at the Abrolhos Islands as the number of participants and visitors grow. There is a perceived fragility to the demersal finfish populations at the Abrolhos and moreover, anecdotal evidence supports the general observation of a decline in numbers of fish taken per fisher.

During the consultation phase associated with the development of this plan, 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 may be too high); and
- a need for tighter controls on the recreational catch.

6.3.1 Abrolhos Islands Recreational Fishing Regulations

The daily bag limits, possession limits, minimum legal sizes and other recreational fishing regulations that apply across the West Coast region, also apply in Abrolhos Islands waters. Full details are contained in the *Recreational Fishing Guide – West Coast Region*, available online or from the Department of Fisheries and most fishing tackle and dive shops.

Additionally, Abrolhos Islands Recreational Fishing Regulations apply. Recreational fishing regulations specific to the Abrolhos Islands are as follows:

Baldchin groper (*Choerodon rubescens*): A fishing closure applies from 1 November to 31 January. It coincides with spawning aggregations and is aimed at protecting breeding stock.

Western rock lobster (*Panulirus cygnus*): They may be taken only by pots - it is not permitted to dive for them at the Abrolhos. The Islands' rock lobster fishing season opens on 15 March and closes on 30 June, and a recreational fishing licence is required.

Samson fish (*Seriola hippos*) and yellowtail king fish (*Seriola lalandi*): Visitors are not permitted to take resident samson fish or yellowtail king fish in the anchorage areas of inhabited islands.

Research work in the area, and consultation with industry and user groups, have led to a good understanding of the fisheries operating at the Abrolhos Islands. Issues of particular concern include:

- the need to review the overall fishing pressure on finfish and where possible, reduce the level of effort, particularly in the shallows (< 10 m); and
- the need to consider possible environmental effects of fishing, including habitat damage by anchors, rock lobster pots, trawling and wetlining.

MANAGEMENT STRATEGIES

44. Continue research into the abundance of target species and catch levels in the Abrolhos Islands and include the use of volunteer logbooks for recreational fishers, including island residents and charter boats. (Ongoing)

45. Implement detailed monitoring of the catch of finfish from the Abrolhos Islands area. (Ongoing)

46. Recognise that the Abrolhos is a special area and the largest FHPA in Western Australia, by implementing specific management that ensures sustainability and maintenance of biodiversity. (New)

6.5 Integrated Fisheries Management

The introduction of Integrated Fisheries Management (IFM) is a recent development in the management of fisheries in Western Australia. IFM is an initiative aimed at addressing the issue of how fish resources in Western Australia can be best shared between competing users within the broad context of "Ecologically Sustainable Development", or ESD.

In summary, IFM involves:

- setting the sustainable harvest level of each resource that allows for an ecologically sustainable level of fishing;
- allocating explicit catch shares for use by indigenous, recreational and commercial fishers;
- continual monitoring of each sector's harvested catch;
- managing each sector within its allocated catch share; and
- developing mechanisms to enable the reallocation of catch shares between sectors.

The Government in its 2005 election commitments listed western rock lobster, abalone, west coast demersal scale fish and Gascoyne scale fish as the first four fish resources to be brought under the IFM framework. The IFM process is under way for western rock lobster and abalone.

Demersal scale fish stocks that inhabit the Abrolhos Islands would be subject to consideration for allocation when the IFM process commences for west coast demersal scale fish in 2007.

MANAGEMENT STRATEGY

47. Ensure that AIMAC is consulted over any allocation of fisheries treated under IFM. Any allocation of fisheries should be on a zonal basis. (New)

6.6 Sustainable Tourism

The Sustainable Tourism Plan for the Houtman Abrolhos Islands was released in February 2001. A formal process was instigated by AIMAC and the Department of Fisheries to seek the expressions of interest for marine and land-based tourism concepts that were environmentally sustainable for the area.

The only acceptable expression of interest came from a development group proposing a land-based establishment at Long Island in the Wallabi Group. At present this proposal is subject to Commonwealth and State environmental processes of assessment (August/September 2006).

6.6.1 Visitor Fees

The Management Plan of the Houtman Abrolhos System developed by the Abrolhos Islands Management Advisory Committee (AIMAC) was published in December 1998.

Section 12.2 of this plan clearly states the intention to implement an "area access fee for all visitors to the Abrolhos Islands and their State Territorial Waters''. Following the Management Plan, the *Sustainable Tourism Plan for the Houtman Abrolhos Islands* was published in February 2001, again stating the intention of implementing a visitor fee.

Strategy 17 states, "institute a visitation fee for all visitors to help recover the cost of managing the islands and provide facilities for them''. The intention of both of these Plans is consistent with the current State Government 'user pays' principle.

MANAGEMENT STRATEGIES

48. Manage environmentally sensitive tourism at the Abrolhos Islands through the development of appropriate management methods. (Modified)

49. Implement a visitor fee regime for all visitors to the Abrolhos Islands Reserve and the Abrolhos Islands FHPA, concomitant on relevant legislation being adopted. (New)

6.7 Bioprospecting

Bioprospecting for biologically active compounds in terrestrial and marine organisms that may lead to the development of new and significant human and veterinary pharmaceuticals and agrochemicals has generated an increasing demand for access to Australia's biological resources from both research and commercial organisations.

Developments are not limited to pharmaceutical or agrochemical areas and it is quite possible that others areas of science may benefit from these activities. This also includes developments in relation to taxonomy and the documentation of the State's biodiversity, the recognition of the economic value of biological resources and the fostering of interest in their conservation.

Supported by regulation 179 of the *Fish Resources Management Regulations 2005* "Taking or handling of Fish for Genetic or Chemical Extraction or Analysis" the Department of Fisheries continues to develop and implement management arrangements in relation to bioprospecting activities within Western Australia.

In view of the above, it is considered from both a Commonwealth and State whole-of-government perspective that there is a need to develop suitable access policies to ensure a coordinated, clear and consistent approach across government.

It was also anticipated that effective management would result in significant benefits such as:

- improved conservation and management of native biota, and preservation of biodiversity;
- socio-economic benefits from the development of (for example) new pharmaceuticals and food stuffs from native biota, from the licensing of intellectual property rights and from the development of new value-adding resource based industries;
- preservation of favourable conditions of access to other countries' indigenous resources; and
- scientific benefits including enhancement of knowledge and of Australia's research capacity and training of scientists.

MANAGEMENT STRATEGY

50. Manage access to biological resources using the FRMA Regulations (1995) with respect to bioprospecting at the Abrolhos Islands. (Ongoing)

6.8 Mining and Oil Exploration

In referring to FHPAs, 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 Islands. However, any proposals for undertaking mining or petroleum exploration would require scrutiny under the *Environmental Protection Act 1986*.

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 exists between the Environmental Protection Authority (EPA) and the Department of Industry and Resources (DOIR). For FHPAs, the procedures will involve considerable consultation with the Department of Fisheries and the recommendation of the Minister for Fisheries.

MANAGEMENT STRATEGIES

51. Ensure AIMAC is fully informed by the EPA, DOIR and companies about exploration or development proposals for the area, and is able to contribute to any assessment process. (Ongoing)

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

SECTION 7 RESOURCING FOR MANAGEMENT AND COMPLIANCE

Aside from use by the fishing community living on the islands, the Abrolhos Islands 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 aircraft and boats in the islands.

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

The Department of Fisheries needs to identify the resources required to effectively manage the expected increase in use of the Abrolhos Islands by visitors. General funding sources include: treasury consolidated funds; and revenue sources from Abrolhos Islands usage.

MANAGEMENT STRATEGIES

53. Provide information to visitors on the values of the marine and terrestrial habitats of the Abrolhos Islands, their wise use and applicable regulations. (Ongoing)

54. Ensure government officers have appropriate authority to undertake enforcement activities. (Ongoing)

55. Facilitate reciprocal functions by officers of different government agencies through the provision of appropriate training. (Ongoing)

56. Review options and actively seek resources for implementing the management plan, including appropriate external sources and licence fees. (Modified)

57. Ensure surveillance activities are coordinated between government agencies. (Ongoing)

SECTION 8 REVIEW IMPLEMENTATION AND COMMUNICATION

This management review provides a broad range of strategies for obtaining "best practice" management of the Abrolhos System. AIMAC has the responsibility of advising the Minister for Fisheries on management of the Abrolhos Islands.

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

MANAGEMENT STRATEGIES

58. Prepare a prioritised implementation plan with costings and identified funding, immediately. (New)

59. Annually review the plans implementation. Prepare a report on progress and adjust management accordingly. (Modified)

60. Develop a set of performance indicators for measuring the implementation of the plan. Report on these indicators as part of the annual review process. (Modified)

8.1 Community Liaison

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 the Department of Fisheries and other Government staff working in the Abrolhos Islands, but also through talks and the presentation of brochures, signs, and other information.

8.1.1 Abrolhos Islands Communication Plan

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

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

To facilitate community awareness and educate users of the area it is envisaged that a communication plan be prepared and implemented as a high priority.

MANAGEMENT STRATEGIES

61. Implement the communication plan for the Abrolhos Islands in cooperation with other agencies, community groups, Abrolhos schools and interested individuals. (Modified)

62. Source funding to appoint a community education officer to develop and implement the communication plan for the Abrolhos System and engage all user and interest groups in developing an increased awareness of the area. (New)

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9.2 Acronyms

Abrolhos Islands Land Management Sub-Committee (AILMSC)

Abrolhos Islands Management Advisory Committee (AIMAC)

Abrolhos Islands Research Institute (AIRI)

Australian Institute of Marine Science (AIMS)

Bureau of Meteorology (BOM)

Commonwealth Scientific and Industrial Scientific Organisation (CSIRO)

Curtin University of Technology (Curtin)

Department of Environment and Heritage (DEH)

Ecologically Sustainable Development (ESD)

Ecosystem Based Fisheries Management (EBFM)

Edith Cowan University (ECU)

Environmental Protection and Biodiversity Act (EPBC)

Environmental Protection Authority (EPA)

Fish Habitat Protection Area (FHPA)

Fish Resources Management Act 1994 (FRMA)

Heritage Council of Western Australia (HCWA)

Integrated Fisheries Management (IFM)

International Maritime Organisation (IMO)

Memorandum of Understanding (MOU)

Murdoch University (Murdoch)

Natural Resource Management (NRM)

Particularly Sensitive Sea Area (PSSA)

Reef Observation Area (ROA)

Rock Lobster Industry Advisory Committee (RLIAC)

Square nautical miles (sq nm)

University of Western Australia (UWA)

Volunteer Fisheries Liaison Officer (VFLO)

Western Australian Department of Environment and Conservation (DEC)

Western Australian Department of Land Information (DLI)

Western Australian Department of Fisheries (DoF)

Western Australian Department of Industry and Resources (DOIR)

Western Australian Department of Planning and Infrastructure (DPI)

Western Australian Marine Science Institution (WAMSI)

Western Australian Museum (WAM)

Western Rock Lobster (WRL)

Western Rock Lobster Council (WRLC)

Western Australian Tourism Commission (WATC)

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SECTION 10 FIGURES

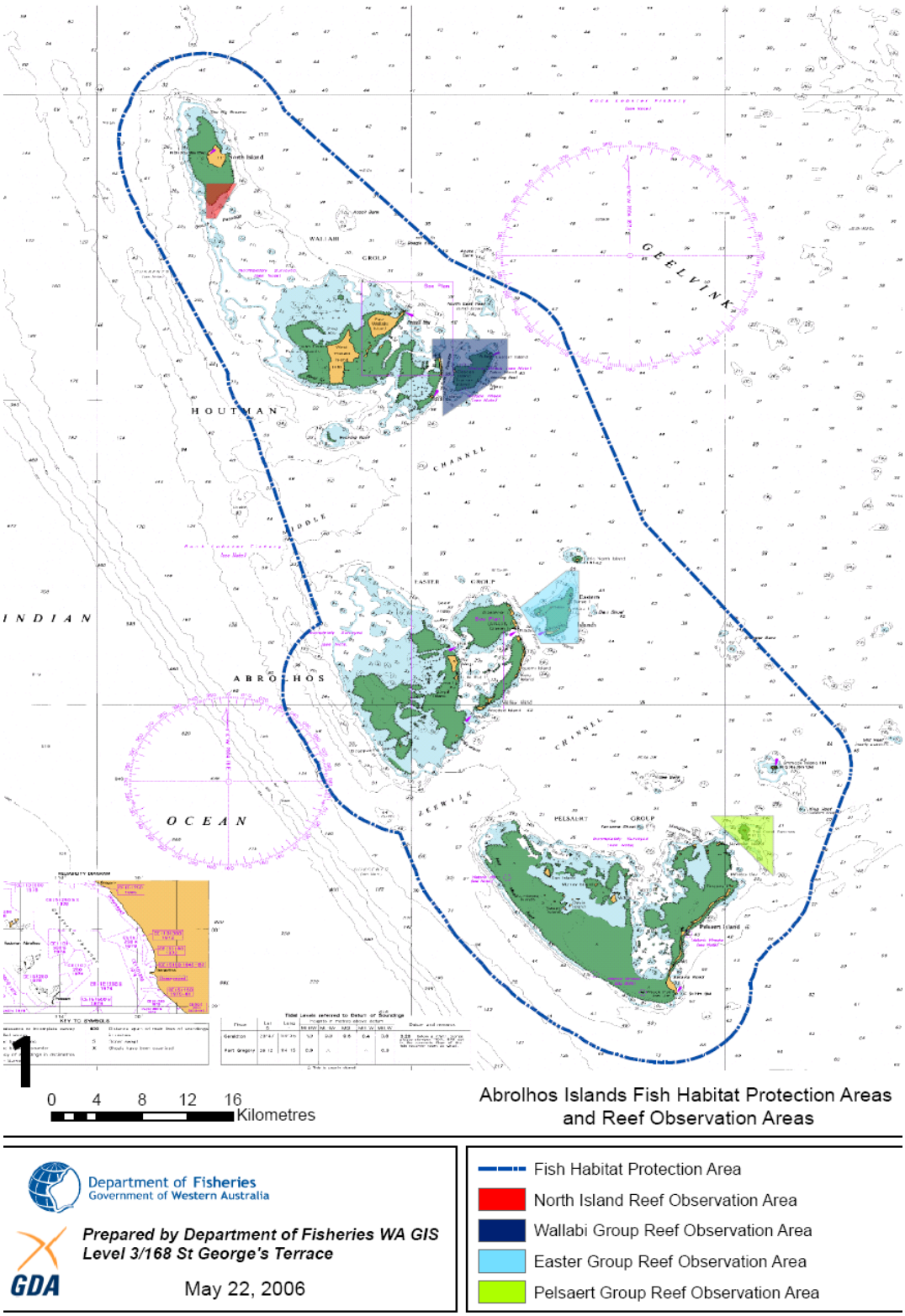

Figure 1 Location of the Houtman Abrolhos Islands and Fish Habitat Protection Area

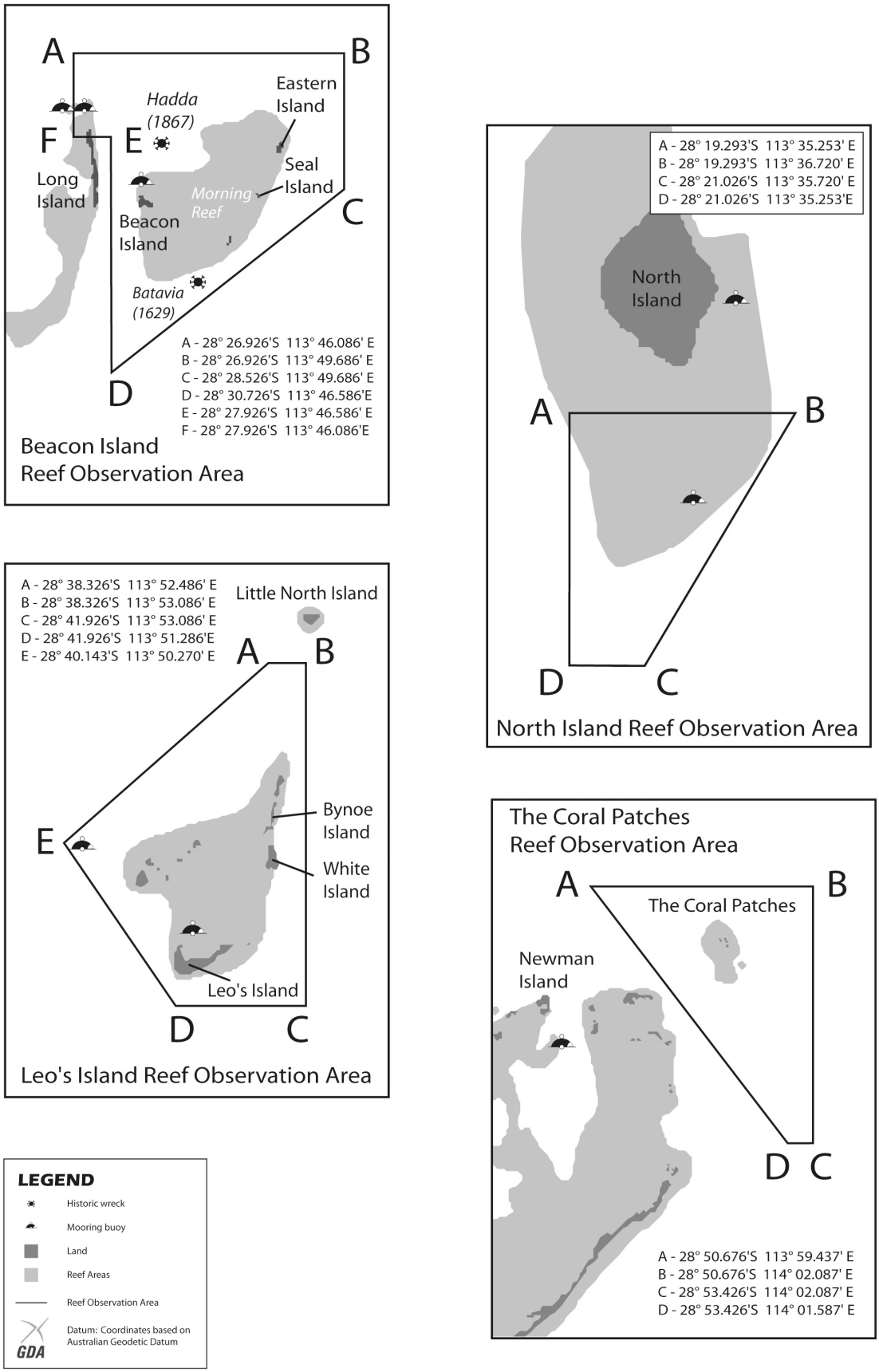

Figure 2 **Location of Reef Observation Areas within the Houtman Abrolhos Islands**

Figure 3 **Location of the Batavia Shipwreck National Heritage Listed Area in the Wallabi Group**

APPENDIX 1 DESIRED PLANNING OUTCOMES FOR THE HOUTMAN ABROLHOS SYSTEM 2007-2017

Key: H = high priority, M = medium priority

Issue	Outcomes	Priority
Sustainable management of the terrestrial ecosystem	**Develop Terrestrial Management Plans and appropriate legislative framework [note opportunity to link to Conservation Management Plan].**	**M**
	Consider cross-authorisation of Fisheries officers [under other legislation].	**M**
	Consider research collaboration or contracting-in opportunities with appropriate scientists/organisations involved in seabird and other flora/fauna research.	**H**
	Collaborate with DEC and other relevant organisations in development of Terrestrial Management Plan.	**M**
	Consider separate Cultural Heritage Plan developed in collaboration with relevant organisations such as the Museum and DEH.	**M**
Managing the built environment	**Develop "procedures manual" for infrastructure management issues associated with the Abrolhos Islands.**	**M**
	Update infrastructure plan for the Abrolhos.	**M**
	Amend regulations to reflect Abrolhos Islands Building Code (including jetties).	**H**
	Contract-out building or other inspections (on a cost recovery basis).	**M**
	Implement waste management plan.	**H**
	Contract-out waste inspections on a case-by-case basis.	**M**
	Owners to have ownership of plan and code	**M**
Ensuring appropriate governance	**Clarify existing legislative arrangements (roles and responsibilities).**	**H**
	Re-assess existing arrangements against current objectives and amend as necessary.	**H**
	Ensure proposed changes to FRMA sufficient to meet Abrolhos current and future needs.	**H**
	Use vehicle of MOU between DEC and DoF to ensure agreement and clarity around roles and responsibilities. Consider similar arrangement with DLI.	**H-M**
	Consider role of, and linkage with, the Commonwealth given regional Natural Resource Management processes.	**H-M**
	In relation to management, identify potential partners including local government and DEC.	**H**

	Review existing management structures including AIMAC.	**H**
	Develop management arrangements with DEC, DPI, local government, etc.	**H**
	Need to undertake risk assessment, set performance measures and follow-up with appropriate audit and review.	**H**
Ensuring appropriate human skills and resources	**Identify skill gaps (e.g. coral, seagrass, land management, planning, tourism).**	**H**
	Identify collaborative links (e.g. universities, CSIRO, Government agencies).	**H**
	Recruit, retrain and contract to meet service needs.	**M**
	Use student projects.	**M**
	Use volunteers (e.g. VFLOs, work experience students).	**M**
	Seek external grants.	**H**
	Seek Government commitment to Abrolhos Islands. Need priority within Government. Seek community support (Geraldton).	**H**
	Re-prioritise existing projects/resources within DoF to meet identified Abrolhos needs.	**H**
Acquiring and using relevant knowledge	**Assess and document research priorities [based on research by Chubb et al] noting need to also include "social" research. Consider development of strategic research plan.**	**H**
	Identify and undertake ecological research related to habitats and connectivity to other systems [e.g. Leeuwin Current]. Note linkage to external grant applications	**M**
	Undertake collaborative research, noting AIRI opportunity and linkage to student research.	**H**
	Hold marine biological workshop.	**M**
	Undertake research on effects of human use on ecosystem (e.g. coral, sea-lions).	**M**
	Conduct baseline monitoring to assist with setting allowable impact levels/decision rules for management.	**M**
Ensuring sustainability within a multiple use framework	**Identify user groups (note diversity of groups).**	**H**
	Identify impacts of each user group and determine management gaps (e.g. western rock lobster management is sound, aquaculture could do better). As part of this process, identify "system" outcomes (i.e. ESD approach).	**H**

	Develop management approaches for emerging and 'unmanaged' industries and activities - • **Aquaculture – ESD assessment; implement management programs.** • **Tourism/visitation – monitor visitor levels and pre-determined factors to detect impacts.** • **Mining - enforce requirements for baseline monitoring and environmental management programs.**	**H**
	In relation to multiple use and potential conflict, consider possible zoning approach, use of an allocation committee; and education and awareness raising between and among groups.	**M**
	Need to develop "whole of Abrolhos" performance measures.	**M**
Achieving community involvement and engagement	**Review AIMAC processes in relation to community engagement including:** • **opportunity for an AIMAC newsletter;** • **engagement with conservation groups; and** • **identify community champions and advocates.** **Note linkage to communications strategy below.**	**M**
Ensuring appropriate communications, marketing and education	**Undertake action to fix divisive image/messages from Government and government departments [DoF/DEC messages]. Need to include commitment to operations and projects.**	**H**
	Develop business and marketing strategy for AIRI (note markets include research, education, sponsorships and business/corporate community).	**M**
	Abrolhos Islands tourism issues and planning to be considered, including issues around volume and capacity. Note linkage to existing Abrolhos Tourist Plan.	**H**
	Develop communications strategy to profile Abrolhos Islands management including awards, media strategy and opportunities associated with freelance/commercial media. Need a specific policy/business rule around media requests and opportunities.	**H**

APPENDIX 2 ABROLHOS ISLANDS VISITATION STUDY 2002-06: SUMMARY OF FINDINGS

A2.1 Introduction

The purpose of the 'Summary of Findings' report is to document the published and unpublished visitation data for the Houtman Abrolhos Islands, Western Australia, gathered between 2002 and 2006. The data documented in this report resulted from doctoral research work undertaken by Emily Stoddart, of the School of Earth and Geographical Sciences at the University of Western Australia.

In 2006, the Abrolhos Islands Management Advisory Committee (AIMAC) supported the ongoing research program through an *ad hoc* scholarship to enable further research to occur in 2006.

The Abrolhos Islands Visitation Study has two broad aims: firstly, to determine changes in visitation in view of a perceived increase in use of the islands as a tourist destination; and secondly, to inform the development of sustainable visitor management regimes with knowledge of current profiles and patterns in visitation to the Abrolhos Islands. More specifically, the objectives of the report are to establish the following:

1. temporal changes in annual visitor numbers,
2. seasonal variations in visitation,
3. spatial distribution of visitation across the four island groups,
4. activity effort by visitors,
5. visitor profiles by visitor types, and
6. attitudes to visitation and visitor management.

A2.2 Previous Studies

Estimates of annual visitor numbers, including 1,000 charter boat passengers and 1,500 rock lobster fishers, family and visiting relatives and friends, were first published by the Abrolhos Islands Consultative Council (1989). Using the records of a prototype safety notification system for private recreational boat visitors, the Department of Fisheries found 28 boats carrying 252 passengers registered trips to the Abrolhos Islands in 1996 (AIMAC, 1998).

In 2002 the Fisheries Research Publications; *Towards as assessment of the natural and human use impacts on the marine environment at the Abrolhos Islands, Volume 1 & 2* (Webster et al., 2002a; 2002b), were released. Techniques used to collect visitor numbers included interviews with key stakeholders, extraction of data from charter boat logbooks, and surveys of charter boat operators.

It was concluded that in 2001 approximately 15 charter boats operated at the Abrolhos Islands, approximately 150 charter boat trips were undertaken per year, and the number of passengers was 1,650. Webster *et al.* (2002a) also concluded that although the numbers of visiting relatives and friends of rock lobster fishers are usually low across the bulk of the fishing season, "it is estimated that numbers increase to 2000-4000 over the Easter period alone and this group constitutes a major proportion of visitors to the islands." (Webster *et al.*, 2002a: 91).

The numbers of visiting private recreational boats was not quantified, and it was reported that acquisition of information about the activities of visitors was difficult due to the dispersed nature and infrequency of their visits. In an associated Fisheries Research Report, Chubb and Nardi (2003) concluded that the combined number of commercial and recreational power vessels visiting the Abrolhos each year is unlikely to exceed 300 with most activity occurring during the three and a half month lobster season.

VISITATION TYPE	PERIOD	TOTAL NUMBER OF TRIPS	TOTAL NUMBER OF PASSENGERS	SOURCE
Private recreational boats	**1996**	**28**	**252**	**AIMAC, 1998**
Commercial charter boats	**1988**		**1,000**	**Abrolhos Islands Consultative Committee, 1989**
	2001	**150**	**1,650**	**Webster *et al.*, 2002**
Boat-based visitors – ALL TYPES	**2003**	**300**		**Chubb and Nardi, 2003**
Visiting Relatives and Friends of Rock Lobster Fishers (RL VR&F)	**1988**		**1,500**	**Abrolhos Islands Consultative Committee, 1989**
	2002		**2,000 – 4,000**	**Webster *et al.*, 2002**

Table 1 Previous estimates of annual numbers of tourist trips and tourist numbers for periods between 1988 and 2002.
***(Source:* Abrolhos Islands Consultative Committee 1989; AIMAC 1998; Webster *et al.* 2002a; and Chubb and Nardi 2003)**

A2.3 Research Methods

The research methods deployed to investigate visitation at the Abrolhos Islands targeted the specific types of visitation.

Derived from primary field data and secondary sources, the results provide a numerical baseline of the Abrolhos Islands visitor sector from 2002 to 2006. Moreover, the results provide a profile of the composition of the visitor sector and of the visiting and recreational activity effort across the four island groups, which have a direct bearing on the development of targeted and site specific visitor and tourism management strategies.

However, this numerical baseline of visitation at the Abrolhos is limited by the lack of any measure of visiting friends and relatives of the rock lobster fishers. Numbers of private recreational boat trips and passengers to visit the Abrolhos during the in-season period have not been counted, with the exception of the Easter holiday period.

Further, the rigour of the Department of Fisheries off-season notification records remains in doubt. It is the only source of data on private recreational boat visits to the Abrolhos and it relies on voluntary submission of trip notifications. More such boats may be visiting undetected by the visitation counts undertaken. The reliance on only two sets of annual data for air charter tourist trips to the Abrolhos limits the reliability of trends detected for this visitation type.

A2.4 Summary of Findings

A2.4.1 A Visitation Baseline

In view of the objective of the project to quantify visitation to the Abrolhos Islands, the research completed between 2002 and 2006 established that the mean number of trips by private recreational boats to the Abrolhos Islands during the off-season periods was 63, while the mean number of passengers was 305.

Commercial charter boat trips to the Abrolhos Islands for 2002 to 2005 were found to average 391 per annum, while passenger numbers were found to average 4,074 per annum.

For air charter tourist flight numbers for 2003/04 and 2004/05, the mean number of flights was 190 per annum, while the mean annual number of air charter tourist passengers was 634 (refer to Table 2.).

Annual visitor numbers are not extractable from the results of the Easter aerial surveys of visiting boats. However, they confirm that the number of visits by boats (and therefore of passengers) increases across the in-season period, as against the number of visits occurring during the off-season period, given that the number of visiting boats counted on one day during the in-season was 60.

The figure of 60 boats is close to the average total number of private recreational boats to visit the Abrolhos Islands across the eight months of the off-season period (Table 2.).

Annually, the combined number of boats of all types to make the trip to the Abrolhos Islands in the years 2002/06 has ranged from 439 to 511, and these figures do not include the number of private recreational boats to visit during the in-season period. In terms of visitor numbers, the combined number of boat and air passengers to travel to the Abrolhos Islands in the years 2002/06 has ranged from 4,333 to 5,114 (Table 2.). Again, these figures do not include the number of passengers on private recreational boats visiting during the in-season period.

In terms of the composition of the current visitor sector at the Abrolhos Islands, the research has made evident that the commercial charter boat industry accounts for approximately 60 per cent of the total number of trips made to the Abrolhos Islands per year, and for approximately 80 per cent of the total number of passengers who visit.

Again, the number of private recreational boats to visit during the in-season period is not included. The air charter industry is the next most significant contributor, followed by private recreational boats.

VISITATION TYPE	PERIOD	TOTAL NUMBER OF TRIPS	TOTAL NUMBER OF PASSENGERS
Private recreational boat (off-season)	**2002-3**	**87**	**351**
	2003-4	**52**	**239**
	2004-5	**66**	**346**
	2005-6	**48**	**285**
	Mean	***63***	***305***
Commercial charter boat	**2002**	**303**	**4,679**
	2003	**513**	**5,085**
	2004	**404**	**3,570**
	2005	**342**	**2,990**
	Mean	***391***	***4,074***
Air charter – Day-tour & Scenic Flight (Financial Year)	**2003-4**	**178**	**561**
	2004-5	**201**	**707**
	Mean	***190***	***634***
Visiting boat (Maximum daily number of boats counted on Easter Sunday)	**2004**	**60**	**270***
	2005	**42**	**189***
	2006	**46**	**207***
	Mean	***49***	***222****

Table 2. Annual number and mean of tourist trips by visitation type to the Houtman Abrolhos Islands, Western Australia, 2002/06.

***(Source:* Department of Fisheries Off-season Notification Records 2002/03 to 2005/06; Department of Fisheries Tour Operator Logbook Records 2002/05; The University of Western Australia's Air Charter Operator Survey 2004/05; and Easter Aerial Survey 2004/06). *Note: Passenger number not measured, but assumed to be 4.5 per boat.**

A2.4.2 Temporal Changes in Visitation

The research completed has enabled a temporal analysis of visitation to the Abrolhos Islands to address the objective of detecting changes in the scale of the visitor sector.

The visitation study results have been analysed in two ways:

1. statistically for changes across the 2002 to 2006 period for which reliable data has been extracted, and
2. historically, or descriptively, for changes across longer time periods, using the estimates of visitor numbers from previous studies which are not regarded as statistically reliable.

In terms of the findings from statistical analysis of changes in visitor numbers across the study period of 2002 to 2006, of the three visitor types investigated, only air charter tourist flight passenger numbers demonstrated a significant annual increase.

In contrast, analysis of the results for private recreational boats and for commercial charter boats for linear trends indicates the presence of a weak negative correlation (that is, a trend towards an annual decline) in the numbers of charter boat passengers, and in the numbers of private recreational boat trips (refer to Figures 1 and 2).

No linear trend was detected for the number of charter boat trips, or for the number of private recreational boat passengers. Moreover, the small number of annual datasets means that in no case were the trends found to be statistically significant, at a confidence interval of 95 per cent. However, the fluctuation or variance in annual trip and passenger numbers from 2002 to 2006 was found to be statically significant for both private recreational and charter boat visitation, at a confidence interval of 95 per cent.

In terms of historical changes in the numbers of tourists visiting the Abrolhos Islands, any claim the sector has expanded across a longer timeframe can be tested by comparing the findings of the 2002/06 study reported here, with annual visitation estimates from previous surveys (refer to Table 1.).

While not statistically testable, there is descriptive evidence of an increase in the frequency of commercial charter boat trips and the number of passengers carried, from the estimates made in 1988 of 1,000 passengers per year and those made in 2001 of 150 trips, and 1,650 passengers per year, to the results of the 2002/06 study.

The 2002/06 study found the mean number of trips to be 391, and the mean number of passengers was 4,704 per year (refer to Tables 1. and 2.). Similarly, the mean number of trips by private recreational boats during the off-season periods alone from 2002/03 to 2005/06 is higher than the entire annual total in 1996.

The estimate of 300 visiting boats (all types) per year in 2002 has clearly been exceeded by the frequencies of visits detected from 2002/03 to 2005/06 (where the annual average was found to be approximately 450) again indicating an increase in visiting boat numbers (refer to Tables 1. and 2.).

In conclusion, the results do not indicate any decisive or statistically significant time series trends in visitor numbers across the 2002 to 2006 study period, largely due to the small sample of the annual datasets. The exception is the significant increase in recent air charter tourist visitation.

There is descriptive support for an historical increase in the numbers of boat-based visitors. While it could be speculated that there is a weak declining trend in the numbers of boat-based visitors from 2002 to 2006, which would infer that a peak period has occurred around 2002/03, further annual datasets are required to confidently confirm this.

Indeed, with regard to all of the boat-based visitation data analysed, the only statistically supportable statement is that the annual numbers of trips and passengers fluctuate significantly.

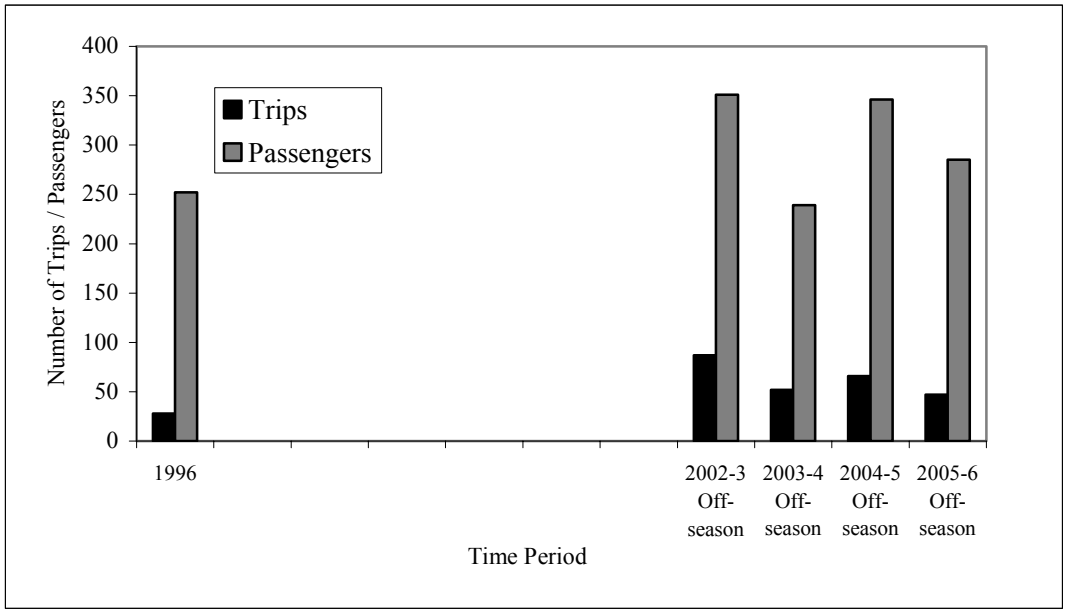

Figure 1 Temporal changes in number of trips and the number of passengers on private recreational boats visiting the Houtman Abrolhos Islands, Western Australia, from 2002 to 2006.

***(Source:* AIMAC 1998; Department of Fisheries Off-season Notification Records 2002-3 to 2005-6)**

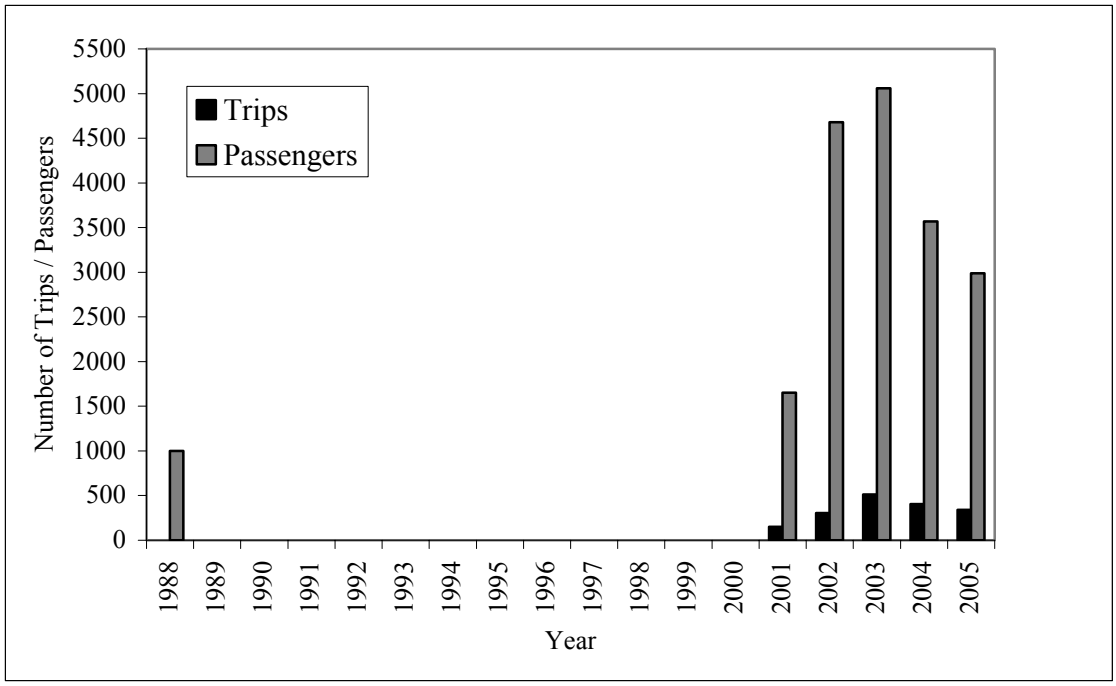

Figure 2 Temporal changes in number of trips and numbers of passengers by commercial charter boats visiting the Houtman Abrolhos Islands, Western Australia, from 2002 to 2006.

(Source: **Abrolhos Islands Consultative Committee 1989; Webster *et al.* 2002a; Department of Fisheries Tour Operator Logbook Records 2002-5)**

A2.4.3 Seasonal Variations in Visitation

Visitation to the Abrolhos Islands fluctuates intra-annually; however, unlike inter-annual visitation numbers, the intra-annual variation of boat visits – both recreational and commercial charter boat - across the years of 2002 to 2005-6 follows a seasonal clear pattern.

Times of low boat visit numbers are December and January, and July and August. The number of commercial charter boat visits peaks in April, when monthly figures have reached 119 (bringing between 824 and 1095 passengers), and again in October, when visits by charter boats range between 22 to 66 in that month.

The numbers of visiting recreational boats peak also in April, when it is likely that more than 60 boats visit, and again in spring, when boat numbers range between 12 and 22 per month. It is likely that these peak periods reflect both favourable seasonal weather patterns, and the calendar of school and public holidays.

There are clear management implications for the delivery of visitor services, and for the enforcement and compliance of recreational fishing regulations, at peak visitor periods.

A2.4.4 Spatial Distribution of Visitation

The spatial analysis applied to the visitation data to determine the distribution of tourist trips across the four island groups has established a strong correlation between individual island groups and visitor types.

Private recreational boat skippers indicated a preference for the Pelsaert Group, while the majority of commercial charter boat operators reported visiting the Easter Group. Air charter operators conducting 'Day Tour' trips visited the Wallabi Group exclusively, though this result reflects the availability of a public airstrip and visitor amenities in this group.

During the peak Easter holiday period, visiting boats were found to be distributed evenly across the Pelsaert, Easter and Wallabi Groups. The five anchorages at which boats were counted the most frequently are: Turtle Bay, Pigeon Island Anchorage, Guano Jetty and Wreck Point, north end of Pelsaert Island (The Hole) and White Bank, or Little Sandy.

Overall, the results indicate that the Wallabi Group receives the greatest number of visits, followed by the Easter Group.

A2.4.5 Recreational Activity Effort

Fishing remains the most popular recreational activity undertaken at the Abrolhos Islands by all visitor types, excepting air charter 'Day Tour' passengers.

However, amongst both recreational and commercial charter boat-based visitors, the numbers and rate of visitors undertaking non-consumptive, or nature-based, activities is either steady or increasing, as it is for commercial charter boats.

The proportion of commercial charter boat operators who identified undertaking non-consumptive/nature-based tourism activities in 2002 was 14 per cent, while in 2005 it rose to 42 per cent. Concurrently, the proportion of commercial charter boat operators who undertook fishing activity trips in 2002 was 86 per cent, the proportion decreased to 74 per cent in 2005.

In terms of the spatial distribution of recreational activity effort across the four island groups, recreational boat skippers indicated a strong preference for the Pelsaert Group for both fishing and non-consumptive activities, while commercial charter boat operators preferred the Easter Group for fishing, and the Wallabi Group for non-consumptive activities.

A2.4.6 Profiles of Visitor Types

Those recreational boats visiting during the off-season reported that a substantial majority of their passengers were of Mid West origin.

The origins of air charter tourists is almost evenly distributed between the categories of 'Over seas', 'Inter-state', 'Perth and regional WA' and the Mid West. However, of the remaining visitor types investigated, commercial charter boat passengers, visiting relatives and friends of rock lobster fishers and recreational boats visiting during the in-season, the majority originated from Perth or regional Western Australia, suggesting that the appeal of the Abrolhos Islands as a tourism destination is largely contained within the state of Western Australia.

A2.4.7 Tour Operator and Visitor Sentiment

Tourist operator perceptions of the Abrolhos Islands, as revealed by the results of the UWA Surveys of Air and Commercial Charter Boat Operators, hinge on the availability of high quality recreational experiences in a remote, uncrowded and wild location, with significant maritime heritage to explore.

One third of commercial charter boat operators also perceived tourism at the Abrolhos Islands (as measured by visiting boat numbers) to be increasing annually. Against this perception of growing visitation, the most frequently stated sentiments made by those visitors surveyed expressed satisfaction with the current state of low level visitation and management of the Abrolhos Islands, and expressed the wish for the islands to remain so without significant alternation.

A2.5 Further Research and Recommendations for Management

Further annual datasets of visitor numbers would enable a more rigorous assessment of changes in visitation over time, though there is some indication that the numbers of visiting boats have increased across the period from 1988 and 1996 to 2006.

The evidence indicates that currently, annual visitor numbers to the Abrolhos Islands fluctuate significantly. Possible explanations for this include seasonal and interannual weather patterns, as well as the limited availability of all-weather anchorages and public moorings.

The current regulatory record-keeping maintained by commercial charter boat operators, and the anticipated landing fee and associated records to be introduced to air charter tourism to the Abrolhos, enable regular scrutiny of future changes in the scale of both of these segments of the Abrolhos Islands visitor sector.

It is the private recreational boat-based segment, and the visiting relatives and friends of rock lobster fishers who remain largely unregulated and unaccounted. Further research of these visitor types is required, and could be achieved using randomised aerial surveys of all anchorages across the entire in-season period; as well as visitor survey-questionnaires of rock lobster fisher households, and the implementation of a voluntary log-book system for a representative sample of the recreational boat-based.

However, without any form of future regulation, such as a visitor entry permit or fee, these visitor types will remain difficult to measure in terms of both numbers and impact.

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APPENDIX 3 MANAGEMENT OF THE HOUTMAN ABROLHOS SYSTEM: STATUS OF STRATEGIES - 2006

Key: *Bold italics=ongoing*, *Italics=completed,* normal text=not relevant

Other Agencies and Relevant Acts

Immediate

1. Develop Memoranda of Understanding between the 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,CALM, WAM, DOT, DEP, WATC)

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 present and future developments. (AIMAC, FWA)

Leases and Licences for Development Purposes

Immediate

4. Develop lease and licensing arrangements for all present and future developments on the Abrolhos Islands. These arrangements will cover jetties, camps and other buildings. (FWA, AIMAC, Crown Solicitor). All monies collected under these arrangements will be used for the management of the Abrolhos Islands System. (FWA)

Land-Use Planning

Immediate

5. Develop disaster emergency plans for fires and cyclones. (FWA, WAPS, SES and WAFB)

6. Prepare land-use plans for development sites on the Abrolhos Islands, taking into account the following issues:

- ***Integration into an overall land-use plan for the Abrolhos Islands.***
- ***Consistency with land-use planning standards applied in WA.***
- ***Consistency with the natural and heritage values of the Abrolhos Islands.***

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. The terms of reference and membership will be reviewed to reflect changing islands user groups. (AIMAC)

8. Review the Abrolhos Islands Regulations and keep them continually updated. (AIMAC, FWA)

9. Establish other sub-committees to provide quality advice to AIMAC on specific issues such as heritage and research matters, as needed. (AIMAC)

Waste Disposal

Immediate

10. Develop a waste management strategy, which produces the most environmentally acceptable waste management procedure for the Abrolhos. This may exceed the minimum requirements of State and Commonwealth legislation. (AILMSC, FWA, DEP)

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

Ongoing

12. Consult with DEP, AILMSC and CALM to determine the most efficient and environmentally acceptable waste disposal procedures for the Abrolhos Islands. (AIMAC, DEP, AILMSC, CALM, FWA)

Airstrips on the Abrolhos Islands

Immediate

13. Implement the recommendations of the Abrolhos Islands Air Service Review. Further review arrangements with regard to service requirements; administrative arrangements; contractual arrangements; tendering processes and liability issues in 2004. (FWA)

14. Upgrade the Abrolhos airstrips and develop associated facilities, such as a waiting area for passengers and toilet facilities, to accommodate existing and future users in a manner consistent with the environmental values of the islands and the recommendations of the Abrolhos Islands Air Service Review. (FWA)

Ongoing

15. Ensure that the airstrips and associated facilities in the Abrolhos Islands 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)

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. Implement the plan of management for the Abrolhos Islands Fish Habitat Protection Area as resources permit. (AIMAC, FWA)

21. Maintain and enhance intrinsic and ecological values of the Abrolhos System. (FWA, AIMAC, CALM, WAM)

22. Undertake research to further the 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 Islands. (FWA)

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

Reef Observation Areas

Immediate

27. Continue the finfish monitoring program in the Reef Observation Areas (ROAs) to determine resident reef fish stock levels and the effects of the ROAs. Publish the results. (FWA)

28. Increase public information about the ROAs. (FWA)

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

Ongoing

30. Retain existing regulations, which protect the ROAs, and ensure appropriate levels of surveillance, research and enforcement as resources permit. (AIMAC, FWA)

The Establishment of Benthic Habitat Data

Ongoing

31. Undertake broad-scale benthic surveys of Abrolhos reefs to determine reef health. Compare the results of these surveys with previous findings to quantify the effects of human impacts including rock lobster fishing and any spatial and temporal changes to these reefs. (FWA, AIMS, WAM, CALM)

Terrestrial Flora and Fauna

Immediate

32. Develop a habitat map of the terrestrial environment of the Abrolhos Islands. (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)

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, in particular sea bird breeding areas, through the development of strategic management and land use plans. (FWA, CALM)

Introduced Flora and Fauna

Immediate

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

Fire Management

Immediate

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

Historic and Heritage Sites

Immediate

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

40. Train relevant Fisheries WA and CALM 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)

Tourism

Immediate

43. Finalise and implement the management plan for environmentally sensitive tourism at the Abrolhos Islands, including policies and operating guidelines. (AIMAC, FWA)

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, AIMAC)

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, FWA)

Ongoing

46. Manage environmentally sensitive tourism in the Abrolhos Islands through the development of appropriate management methods. (AIMAC, FWA, CALM, DOT)

Recreational Fishing and Collecting

Immediate

47. Continue research into the abundance of target species and catch levels in the Abrolhos Islands and include the use of volunteer log books for recreational fishers including island residents and charter boats. (FWA)

48. Review recreational fishing regulations for the Abrolhos Islands as part of the Mid-west Recreational Fishing Review. Consider as part of the Review, the reduction of recreational daily bag limits for Prize fish and Reef fish. (FWA)

49. Seek AIMAC representation on the Mid-west Regional Recreational Fishing Review Committee to express views on recreational fishing at the Abrolhos Islands. (AIMAC, FWA)

50. Subject commercial rock lobster fishers who are fishing from licensed rock lobster vessels to the same regulations as recreational fishers during the Abrolhos rock lobster season, within the Abrolhos Islands Fish Habitat Protection Area. (FWA)

51. Prohibit spear fishing with the use of compressed air within the Abrolhos Islands Fish Habitat Protection Area. Retain the prohibition of spear fishing in Reef Observation Areas. (FWA)

52. Retain existing regulations protecting Samson fish and yellow tail kingfish in anchorage areas within the Abrolhos Islands Fish Habitat Protection Area. (FWA)

53. Prohibit the recreational collection of corals, aquarium fish and shells within the Abrolhos Islands Fish Habitat Protection Area. (FWA)

54. Monitor the success of the above strategies and determine any impediments to their enforcement. (FWA)

Ongoing

55. Continue to apply the Fish Resources Management Act 1994 regulations relating to the taking of fish in the Abrolhos. (FWA)

Diving

Immediate

56. Identify sites, in consultation with the community and local dive operators, which are suitable for the development of dive trails and establish a priority order for their development. (FWA,WAM,CALM)

57. Develop a code of conduct for dive charter operators in consultation with tourist operators. Develop the code of conduct in conjunction with the review of the Aquatic Charter Industry in Western Australia. (FWA, WAM, DOT, CALM)

Ongoing

58. Prepare information for the public about dive sites in the Abrolhos Islands in consultation with diving clubs. (FWA, WAM)

59. Incorporate recommendations on diving in the code of conduct for the Abrolhos Islands. (FWA, WAM, CALM)

60. Monitor intensity of diving in the Abrolhos Islands, and any effects divers may be having on the environment. (FWA, WAM)

Surface Water Activities

Ongoing

61. Provide information to visitors on the various surface water activities available in the Abrolhos Islands. (FWA, DOT, CALM)

62. Incorporate recommendations on surface water activities in the code of conduct for the Abrolhos Islands. (FWA, DOT, CALM)

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

64. Regulate to limit the speed of all vessels near swimming beaches, mooring areas and conservation areas. Determine areas in consultation with user groups and relevant agencies. Identify specific areas where the use of jet skis will not be permitted. (FWA, DOT)

Yacht and Power Boat Visits

Ongoing

65. Provide information to visitors in yachts and powerboats on navigational conditions in the Abrolhos Islands. (FWA, DOT)

66. Incorporate recommendations for safety on yacht and powerboat visits in the code of conduct for the Abrolhos Islands. (FWA, DOT)

67. Monitor yacht and powerboat visits to the Abrolhos Islands, and the effects these may have on the environment. (FWA)

Commercial Fishing and Aquaculture

Immediate

68. Survey waters to determine appropriate areas for scallop trawling. Exclude scallop trawling from all areas, except those with sandy or muddy sediments. (FWA)

69. 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)

70. Develop management guidelines for the Mid-west WA Coast Purse Seine Fishery, taking account of the outcomes of the study into the possible effects of the fishery on seabird nesting sites at the Abrolhos Islands. (FWA, CALM)

71. Reduce wet line fishing effort in the Abrolhos Islands to limit total catch. As part of reducing effort, negotiate with licensed operators to prohibit commercial wet line fishing within the shallows of the main island groups (see Figures 7a, 7b and 7c in this document). (FWA)

72. Negotiate with licensed operators and prohibit commercial shell collecting, coral collecting, aquarium fish collecting and beche-de-mer fishing in the waters of the Abrolhos Islands Fish Habitat Protection Area. (FWA)

73. Undertake surveys of all marine habitats to determine the environmental impact of fishing and boating operations, and prepare strategies to manage unacceptable impacts. (FWA)

74. Ensure any non-endemic species considered for aquaculture at the Abrolhos Islands undergo adequate risk assessment in accordance with established translocation protocols. (FWA, DEP)

75. Ensure all aquaculture proposals for the Abrolhos Islands undergo adequate environmental impact assessment in accordance with DEP/EPA processes. (DEP, FWA)

76. Identify suitable areas within each Abrolhos Islands group where aquaculture projects may be established. (FWA)

77. Develop an aquaculture plan for the Abrolhos Islands, which is consistent with the intrinsic values and uses of the area. (FWA)

Ongoing

78. Assess proposals for any new fishery at the Abrolhos Islands under the provisions of the FRMA (1994) relating to developmental fisheries. (FWA)

Mining and Petroleum Exploration

Ongoing

79. Liaise closely with the EPA and DME about exploration or development proposals for the area, and contribute to the assessment process. (FWA)

80. Ensure the public is fully informed about all proposals. (EPA, DME, FWA, CALM, MPRA)

Other Extractive Industries

Ongoing

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

Marine Structures, Moorings and Jetties

Immediate

82. Prepare policies, standards and guidelines for all marine structures, which meet acceptable standards and avoid environmental damage. (AIMAC, FWA)

83. Prepare lease agreements for all marine structures. (AIMAC, FWA)

84. Develop a mooring register and investigate the appropriate location and operation of public moorings in the Abrolhos Islands. (FWA, DOT)

85. Develop criteria including habitat assessment for the development and operation of public jetties and moorings. (FWA, DOT)

86. Identify sites for the development of public moorings and jetties in consultation with user groups and seek funding for their development. (AIMAC, FWA, DOT)

87. Inspect and maintain all public moorings and jetties that are developed to ensure they remain safe for public use. (FWA, DOT)

88. Complete hazard analysis of all fuel storage facilities at the Abrolhos Islands. (FWA, DEP, DME)

Ongoing

89. Prepare a marine development plan to coordinate the development of all marine structures including any moored accommodation facilities, pontoons, navigational aids, aquaculture and tourism infrastructure, moorings and FADs in the Abrolhos marine environment. (FWA, AIMAC, DOT, DEP)

Navigational Aids

Immediate

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

Information, Interpretation and Public Involvement

Immediate

91. Establish a Volunteer Fisheries Liaison Officer (VFLO) Program at the Abrolhos Islands. Focus this program on both recreational fishing and conservation issues. (AIMAC, FWA)

92. Foster the development of acceptable codes of behaviour at the Abrolhos Islands and develop an information package for distribution to all user and interest groups. (FWA, DOT)

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

Ongoing

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

Knowledge

Immediate

95. 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,FWA, WAM, MPRA)

96. Encourage coordinated research by outside bodies and individual researchers. (AIMAC, FWA, WAM)

97. Monitor the effects of increased usage of the Abrolhos Islands to provide information , which can be used to evaluate and improve management strategies. (FWA, CALM, WAM)

98. Make all research findings readily available to the community, where possible. (AIMAC, FWA, WAM, MPRA)

Ongoing

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

Restricted Access to Large Ocean-Going Vessels

Ongoing

100. Encourage the Australian Maritime Safety Authority (AMSA) to investigate the declaration of a Particularly Sensitive Sea Area (PSSA) around the Abrolhos Islands. (AIMAC, FWA, DOT, AMSA)

Community Liaison

Ongoing

101. 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 at the Abrolhos Islands. (AIMAC, FWA, CALM)

Resourcing, Surveillance and Enforcement

Immediate

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

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

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

Ongoing

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

106. Ensure surveillance activities are coordinated between the Department of Fisheries (WA), WAM, CALM and other government agencies. (FWA, WAM, CALM)

Safety

Ongoing

107. Provide information to the public on safety while at the Abrolhos Islands. (AIMAC, FWA, DOT)

108. Assist the Police and Department of Transport in search and rescue operations at the Abrolhos Islands. (FWA)

Plan Implementation and Review

Immediate

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

Ongoing

110. Annually review plan implementation. Prepare a report on progress, and adjust management accordingly. (AIMAC, FWA)

111. Develop a set of performance indicators for measuring the implementation of the plan. Report on these indicators as part of the annual review process. (AIMAC, FWA)

112. Complete a risk assessment associated with human usage of the Abrolhos Islands and surrounding State Territorial Waters. (FWA, AIMAC, SGIO).