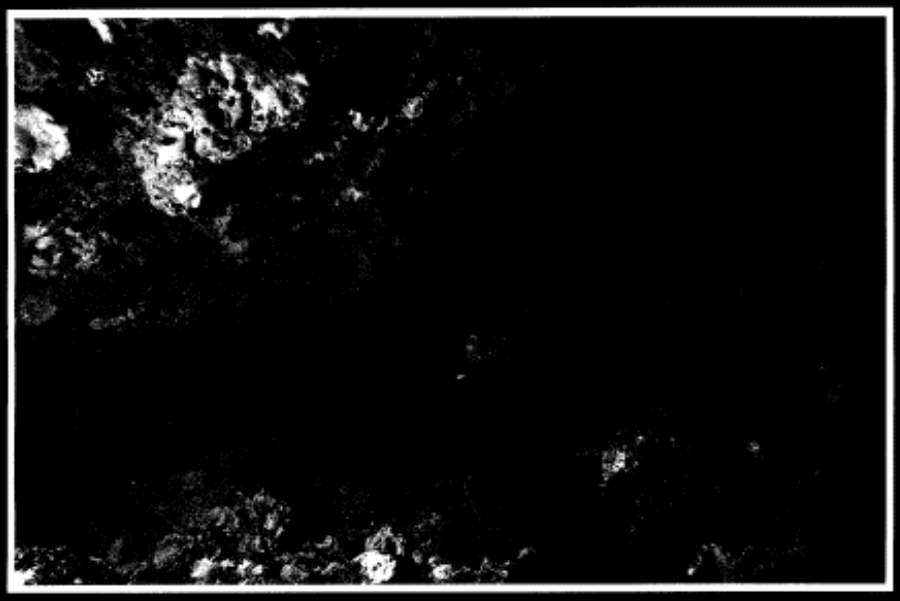
Marmion Marine Park

Management Plan 1992-2002



MANAGEMENT PLAN No 23

Department of Conservation and Land Management

National Parks and Nature Conservation Authority

MARMION MARINE PARK

MANAGEMENT PLAN

1992-2002

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PREFACE

Conservation reserves in Western Australia, such as marine parks, national parks, marine nature reserves, nature reserves and other reserves are declared under the Conservation and Land Management Act, and are vested in the National Parks and Nature Conservation Authority (NPNCA). Marine Parks are managed by the Department of Conservation and Land Management (CALM). Fisheries activities in Marine Parks are regulated under the Fisheries Act and managed in collaboration with the Fisheries Department.

The NPNCA is responsible for the preparation of management plans for all waters and land that are vested in it. Plans are prepared by CALM and released as drafts for public comment. After consideration of public comment, the NPNCA submits the revised plans to the Minister for the Environment for approval.

This document was approved by the Minister for the Environment on 30 January 1992 with the concurrence of the Minister for Fisheries.

The Marmion Marine Park Consultative Committee was established to integrate management between CALM, State Government agencies and local authorities with management responsibilities within, and adjacent to, the Marine Park. The Committee is comprised of representatives from the Fisheries Department, Department of Marine and Harbours, Ministry of Sport and Recreation, Department of Planning and Urban Development, Stirling City Council and Wanneroo City Council. It played a major role in the preparation of this management plan.

ACKNOWLEDGEMENTS

This management plan was prepared for the NPNCA by CALM and is based on an earlier draft published by the Department of Conservation and Environment (DCE, 1985).

The advice provided by the Marmion Marine Park Consultative Committee is acknowledged. Debbie Bowra typed the plan, Anthony Sutton and Richard Grant edited the plan, and the Land Information Branch prepared the maps.

Eva Boogaard provided the photograph for the front cover.

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1.0 OVERVIEW

The Marmion Marine Park lies within State waters between Trigg Island and Bums Rocks, and extends from high water mark to approximately 5.5 km offshore (Map 1). It covers approximately 9 500 ha.

The area has long been recognised as having outstanding conservation value. Habitats in the area include intertidal reef platforms, coastal sand beaches, a high limestone reef about 1 km from the coast, Little Island, and the Centaur Reef/Three Mile Reef system (Marmion Reefs) about 4 km offshore. Of note are complex assemblages of sea floor communities, including seagrass meadows, algal limestone pavement communities and crevice animal associations.

The outer reef protects lagoons to the north and south of Mullaloo Point that provides a range of recreational opportunities for visitors. The area lies adjacent to a densely populated sector of the Perth metropolitan area which is rapidly increasing in size. The Marine Park is extensively used for recreation, particularly swimming, diving, sailing and fishing.

The diversity of natural resources have educative and interpretive values, particularly given their proximity to the metropolitan area. Shipwrecks and other cultural features along the coast are also of interest.

Valuable commercial fisheries, including rock-lobster fishing, operate in the Park.

The Park is accessed from the coast where a range of facilities are provided. Coastal land adjacent to the Marine Park is generally reserved as Regional Open Space for Parks and Recreation and managed by local authorities. Two boat harbours have been built on the coast. It is essential that management of the adjacent land and the Marine Park is integrated.

Management of the Park will need to be one step ahead of recreational demand. It will, however, be difficult to anticipate changes in patterns and levels of use.

Activities are divided into two types, consumptive and non-consumptive activities. Consumptive activities (for example, fishing) will need to be regulated to maintain resources on a sustainable basis, whereas non-consumptive activities can be enjoyed and promoted with minimal impact on the environment.

As the number of people using the Park continues to rise, competition for preferred areas will inevitably cause conflict. Demand for certain uses may increase at a greater rate than others and

recreational uses new to the Park will initiate further change. The only factor that has a degree of certainty is that change is likely to be rapid.

Any particular area in the Park has a finite capacity for use beyond which the area's environmental stability will decline and the user conflict will increase. When this occurs, one type or level of use may have to take precedence. Modification of a site will sometimes lessen environmental impacts and sustain higher levels of use that are more socially acceptable. However, preferred beaches will inevitably become crowded and competition will increase at preferred fishing sites.

As levels of use in the Park and adjacent areas increase, the equity of use' is likely to change. Both management and the community need to be aware that changes will occur and some traditional uses may change.

Recognising the complexity of the area's conservation, recreation, education and commercial values, the Marine Park was declared in 1987 to protect these values. Marmion Marine Park was the first of a number of marine parks established in the State.

The name Marmion has a long-standing, readily identifiable, geographical association with the area. The Marmion Whaling Station, located on land now used as the Sorrento Caravan Park, was one of the original developments in the area. Presumably, the suburb Marmion, the Marmion Lagoon and the Marmion Reefs were named after the Whaling Station. It is an appropriate name for the Marine Park.

2.0 VALUES

Conservation Values

- Rich and diverse marine communities that represent a variety of marine habitats.

- Invertebrate species of special interest, for example, the cowry shells *Cypraea venusta* and *Cypraea friendii* .

- Habitats for marine mammals, such as Sealions, dolphins and whales.

- Seagrass beds in the shallow lagoons that contribute to energy flows in coastal ecosystems and stabilise sandbanks.

- Natural marine features supplement attractive coastal panoramas.

- A suite of marine species and habitats characteristic of Western Australia's mid-west coast, that contribute to the biodiversity and overall conservation value of the marine reserve estate .

- Shipwrecks, such as the historic 'Centaur', are located in Park waters.

Recreational and Commercial Values

- Clean, sandy beaches and relatively protected waters between outer reefs and the coast that provide the opportunity for a variety of recreational activities.

- Marine habitats that support a major resource for recreational fishing, including fin fish and rock lobster.

- Natural resources that attract large numbers of tourist.

- Marine habitats that support a valuable commercial fishing industry, particularly rock lobster.

- Commercial diving and whale-watching tours, are major tourist attractions.

Educational Values

- School groups, tertiary institutions and outdoor clubs use the Park for educational projects such as intertidal biology and snorkelling classes.

- Display and interpretation opportunities such as the Boyinaboat Dive Trail, and at establishments like the Underwater World Oceanarium are available.

- An active 'Friends of the Marmion Marine Park' group that promotes Park values.

- Facilities at the Hillarys Boat Harbour provide CALM and other Government agencies with a focal point from which to disseminate information to the public.

- The City of Stirling has an interesting history of coastal development such as the Marmion Whaling Station.

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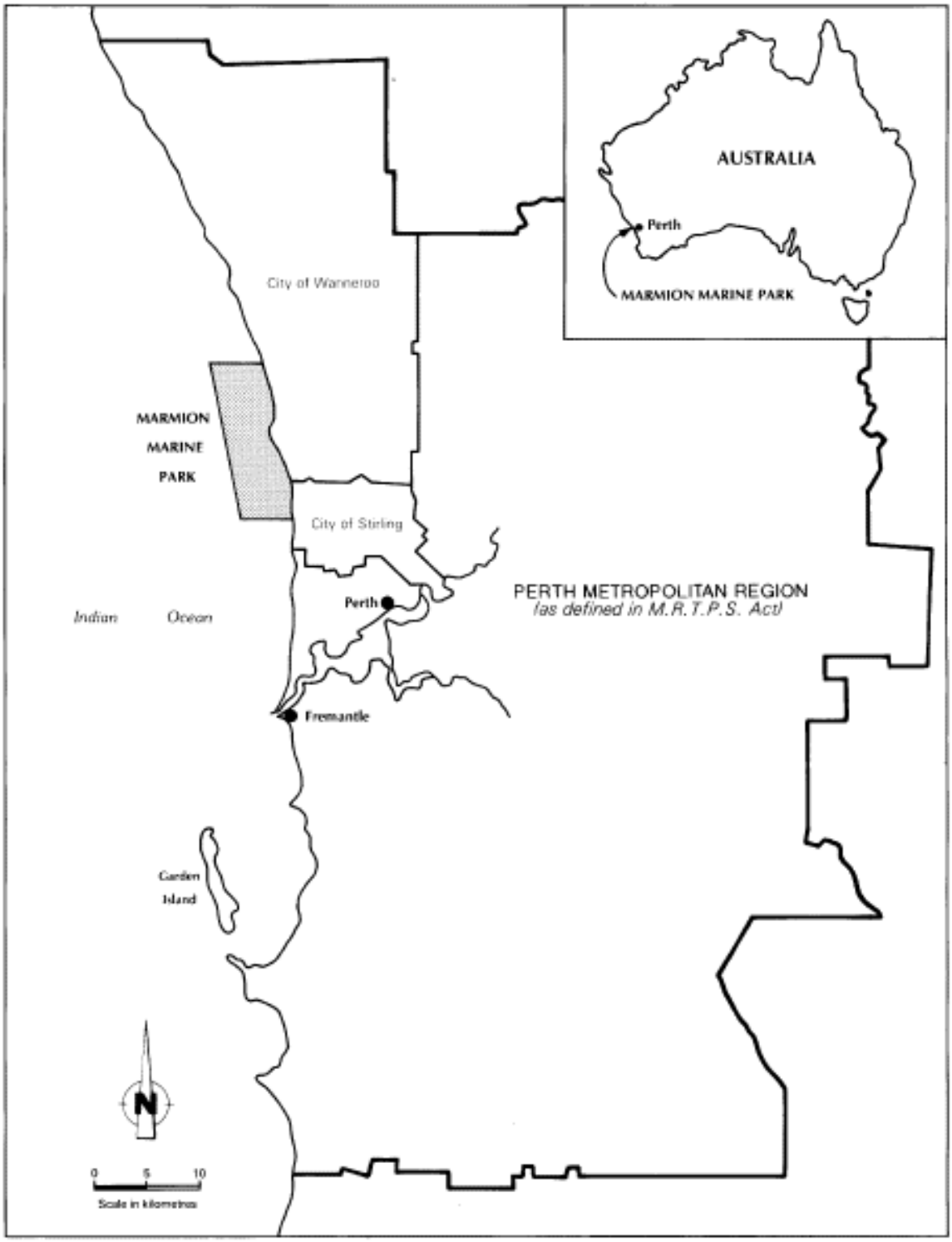
1 Equity of use can be expressed as either the social value of a recreational experience, or the economic value of an activity to any Park user.



Map 1. Location of Marmion Marine Park

Research Values

- Past biological and oceanographic research in the area by State and Federal agencies has made Marmion Lagoon one of the more researched areas along the WA coastline.

- The diversity of important marine habitats, along with the Park's proximity to Perth and make it well suited to future research initiatives.

3.0 MANAGEMENT CONSTRAINTS

The coastal waters of Marmion Marine Park being located, adjacent to an expanding metropolitan population, provide a varied resource for many user groups. Some of the users consume resources such as fish, others do not. In view of the increasing demand for access to the Park for recreational purposes, consumptive uses must be managed to sustain biological resources. It is also clear that some uses conflict with others, and that management techniques, such as spatial separation by zoning, are necessary to ensure user equity.

Conservation Constraints

- Relatively small areas of the higher reef habitat are easily accessible and affected by uncontrolled human activity.

- Coastal processes (wind and waves) may cause major changes to shoreline positions and affect coastal dune/vegetation systems.

- Increasing community expectations for recreational development of areas of high conservation values, centred on Mullaloo Point and surrounding waters.

- Interaction between wildlife and Park users is increasing in a manner that may be detrimental to wildlife populations.

- Installation of a secondary treated effluent outlet in the Park during the life of this plan.

Recreational and Commercial Constraints

- The rapid urbanisation of the northern suburbs is having an increasing impact on the Park.

- User conflicts are escalating as a result of an increasing number of recreational activities in the Park.

- Traditional use of beaches and local waters is posed as an argument against management initiatives.

- Boat launches have increased about 300 percent since the declaration of the Park and are likely to increase further (pers. comm. G Pobar, CALM).

- Little information is available on the impacts of recreational fishing in Park waters and its impact on the ecosystem.

- Recreational and commercial fishers compete for some of the same species.

- The presence of an OTC cable, a water ski area, and boat harbours require restrictions of recreational activities in some areas.

- Access to sites along the coast, including developments such as the Hillarys Boat Harbour, provide a focus and thus more applications for commercial concessions such as jet ski hire, parasailing, charter etc.

- Safety requirements and weather conditions prohibit some concessionary operations that may otherwise be possible.

- Suitable sites where concessionairies may operate without conflicting with existing recreational use are lacking.

Educational Constraints

- Increase in requests by schools, other educational and research institutions for project ideas, presentations, guided excursions and involvement in Park operations.

- Owing to the area's accessibility there are many applications for permission to collect flora and fauna for personal, scientific or commercial purposes.

4.0 PRINCIPLES OF MANAGEMENT

The principal management aim is to conserve the Park's marine environment while allowing recreational and commercial activities that are compatible with conserving the natural environment.

The principal dilemma of management is where to strike a balance between using the Park and exploiting it's natural resources, and conserving the values which make the Park attractive. Inevitably, some uses cannot be provided for if potential conflict with other uses is to be avoided.

This in turn is directly associated with the ability of managers to be able to meet community expectations for management, including the provision of services and facilities, within the reality of limited resources.

Fishing is to be controlled to a level where fish and other animal or plant populations are not adversely affected in the long term. To avoid conflict between fishers and other Park users who wish to enjoy marine environments free from exploitation, the aim of management is to provide some areas free from fishing. Another management aim is to promote an appreciation and understanding of the marine environment by providing information, interpretation, and education programs.

5.0 EVOLUTION OF THE MARINE PARK

The quality and diversity of the flora, fauna and habitats of the Marmion reef and lagoon ecosystems were first noted by the Australian Marine Science Association in the 1960s. The Association, which recommended that the area be reserved, also recognised its accessibility and recreation potential.

In 1981 the System 6 Study Report contained the following recommendations for the metropolitan location M10 (offshore reefs - Ocean Reef to Trigg):

- the Environmental Protection Authority (EPA) should commission a study of the Sorrento-Mullaloo reefs (location M10) with the aim of recommending the establishment of an Aquatic Reserve.
- marine life should be conserved through revision of regulations to prevent any fishing, except by line (DCE, 198 1).

These recommendations were revised in 1983 by the EPA.

In response to a Government directive in February 1985, the Department of Conservation and Environment carried out a study to comply with these EPA recommendations. The M10 team was given the following terms of reference:

(i) to characterise and describe the marine environments and marine communities of the area, and produce a report on the findings of the study;

(ii) to identify and evaluate present and future impacts on the proposed M10 marine reserve; and

(iii) after consideration of (i) and (ii) and in consultation with representatives of the user-groups with interests in the proposed M10 marine reserve area, to frame a management plan for the proposed reserve, with respect to scientific research, education, conservation-and recreation.

A draft management plan for the proposed M10 Marine Park (DCE, 1985) was produced in consultation with representatives from over 65 organisations and user groups. The draft plan took into consideration the announcement by the State Government on 11 June, 1985, that the Hillarys Boat Harbour construction would proceed. It also took into consideration the proceedings of a seminar on the proposed M10 Marine Park held on 12 June, 1985 (DCE, 1986). The draft plan was released in October for a period of two months for public review.

On 10 December 1985, the Hon Premier announced the intention to declare the Marmion Marine Park. The Government agreed to allocate appropriate resources to CALM and the Fisheries Department to enable declaration and management of the Marine Park. The Government also authorised CALM to enter into agreements under the authority of Section 16 of the CALM Act, with the two local government authorities involved in order to formalize a management regime for the coastal lands adjacent to the Marine Park. The Park was gazetted on 13 March 1987.

The Marmion Marine Park Consultative Committee, convened by CALM, was formed to address the recommendations of the draft plan. It was agreed that rather than enter into agreements between CALM and the local authorities for inclusion of their lands as part of the "greater marine park", coastal management issues would be addressed by the Committee as they occurred.

The System 6 Report (EPA, 1983) depicted the boundary of the proposed Marine Park between Trigg Island and Ocean Reef launching facility, enclosing Three Mile Reef and Centaur Reef.

Trigg Island is an easily discernable reference point and became a convenient location for the southern boundary of the Park. The northern boundary proposed by the EPA did not relate closely to any discernable physical feature. Also, there were onshore reefs, sandy beaches and seagrass meadows of significance north of Ocean Reef. Consequently, when the Park was declared the northern boundary was located at a convenient point just north of Bums Rocks, thus extending the Park several kilometres. The seaward boundary of the Marine Park is a straight line within the limit of the State territorial waters. The inshore limit is 0.4 metres above datum.

PRINCIPAL MANAGEMENT DIRECTIONS

6. Purpose and Tenure
7. Policies and Goals
8. Zoning
9. Interagency Responsibilities
10. Adjacent Land Management

6.0 PURPOSE AND TENURE

The objective is to ensure the values of the Marine Park are adequately protected by their gazetted purpose and security of tenure.

The Marmion Marine Park was reserved on 13 March, 1987, as an 'A' class reserve, vested in the NPNCA and managed on its behalf by CALM.

The purpose of the Marine Park is:
"...to fulfil so much of the demand for recreation by members of the public as is consistent with the proper maintenance and restoration of the natural environment, the protection of indigenous flora and fauna and the preservation of any feature of archaeological, historic or scientific interest." (CALM Act, 1984).

The Marmion Marine Park as declared on Land Administration Miscellaneous Plan Number 1597:

(a) is all that portion of land, waters and sea bed bounded by lines starting from the intersection of 0.4 metres above datum South of Trigg Island with the easterly prolongation of the northern boundary of Lot 1, Swan Location 611, (including all surrounding reef at Trigg Island) then extending westwards on a true bearing of 270• to a point in Latitude 31•52'38"S, Longitude 115•41'41"E to a point generally northwest of Latitude 31•43'27"S and Longitude 115•39'17"E then east on a true bearing of 90• to the intersection with 0.4 metres above datum on the sea coast (north of Bums Rocks) then southerly along 0.4 metres above datum on the sea coast;

(b) includes Little Island (Reserve Number 39872) and Bums Rocks (Reserve Number 39873);

(c) excludes the Hillarys Boat Harbour and Ocean Reef Boat Harbour (Plan Number 16093) at their outer boundaries;

(d) includes the waters, islands, sea bed, subsoil beneath and airspace above.

The waters of the Marine Park are reserved under the Conservation and Land Management Act and the land components of the Marine Park (Little Island and Bums Rocks) are reserved under the Land Act.

Action

Manage the Marmion Marine Park in accordance with its purpose, vesting and tenure.

7.0 POLICIES AND GOALS

NPNCA AND CALM MANAGEMENT POLICIES

This plan is based on current NPNCA and CALM policies (1991). These policies derive from legislation, principally the Conservation and Land Management Act 1984 (hereinafter referred to as the CALM Act) and Wildlife Conservation Act 1950, and associated regulations. Policies are published and distributed throughout CALM as policy statements. They are available to the public on request.

MANAGEMENT GOALS

CONSERVATION	Conserve all aquatic and terrestrial plant and animal species and communities and the natural processes that sustain them, and the physical, cultural and scenic resources.
RECREATION AND COMMERCIAL	Facilitate public enjoyment and commercial operations in a manner that is compatible with conservation of the natural environment and minimises conflict between users.
EDUCATION	Create an awareness, understanding and appreciation of the marine and coastal environments and the limitations on their use.
RESEARCH AND MONITORING	Seek a better understanding of the natural and cultural environment and the impacts of visitor use and management activities

8.0 ZONING

The objective is to implement a system of management zones that minimises the impact of recreational and commercial use upon conservation values; minimises conflict between recreational uses, giving priority to uses reliant upon an appreciation of the natural environment; and minimises conflict between recreational and commercial uses.

Zoning separates a park into discrete management units, which reflect the characteristics of the natural resources, and allows priorities to be prescribed for their use. Zoning schemes are designed to meet the needs of all park users in an equitable way, providing for the fullest possible range of

activities while minimising conflicts between those seeking to use the park's resources for different purposes.

Zoning schemes also seek to protect inherent values of the park. Particular activities harmful to special properties of particular areas may be excluded from those areas by means of appropriate zone designation.

Activities are, therefore, defined and regulated within each zone. Zones within marine parks are declared under the powers of Section 62 of the CALM Act, while regulations which apply to the management of each zone will be promulgated from time to time under the Wildlife Conservation Act, the CALM Act, the Fisheries Act and other appropriate Acts

ZONING FRAMEWORK

A framework for zoning has been developed for the management of marine parks:

• General Use Zone:
provides for commercial and recreational uses that are consistent with the conservation of natural resources. In this context conservation means fishing within the sustainable limits of fish stocks. Permissible activities are specified by regulations introduced under the powers of the Fisheries Act (all forms of fishing) and the CALM Act (other activities).

• Recreation Zone:
provides for recreational uses that are consistent with conservation of natural resources. Commercial fishing is not permitted. Recreational fishing is regulated under the powers of the Fisheries Act. Commercial concession operations for recreation activities may be provided where they are compatible with other uses, and regulated under the powers of the CALM Act.

• Sanctuary Zone:
provides for the protection of environmental values and the exclusion of any human activities likely to damage the environment. Specified passive recreational uses consistent with the protection of environmental values may be permitted. Fishing is not permitted. Commercial concession operations for recreation activities (for example, dive tours) may be approved where there is no conflict with other uses, and they will be regulated under the CALM Act. Sanctuary zones will usually cover areas containing vulnerable or special interest biota, which require the highest possible level of protection. Such zones may be selected solely to protect environmental values or to provide visitors or research workers with opportunities to see and study marine life in an undisturbed state.

Restrictions on certain activities, including the type of gear used, the method of fishing, and the taking of certain species or classes of animals, may be declared over the whole or any part of the Park.

Research in all zones will be subject to permit; however, certain extractive or manipulative research techniques may not be permitted, particularly in Sanctuary Zones.

The occurrence of special natural events, such as seabird breeding, or incidents such as shipwrecks, in all zones may require access to be prohibited or restricted for a specified period of time, or limited to specified means. These limitations may be declared by the Minister from time to time, (after appropriate consultation) under the power of Section 62 of the CALM Act, in addition to the Park zoning scheme.

APPLICATION OF ZONES

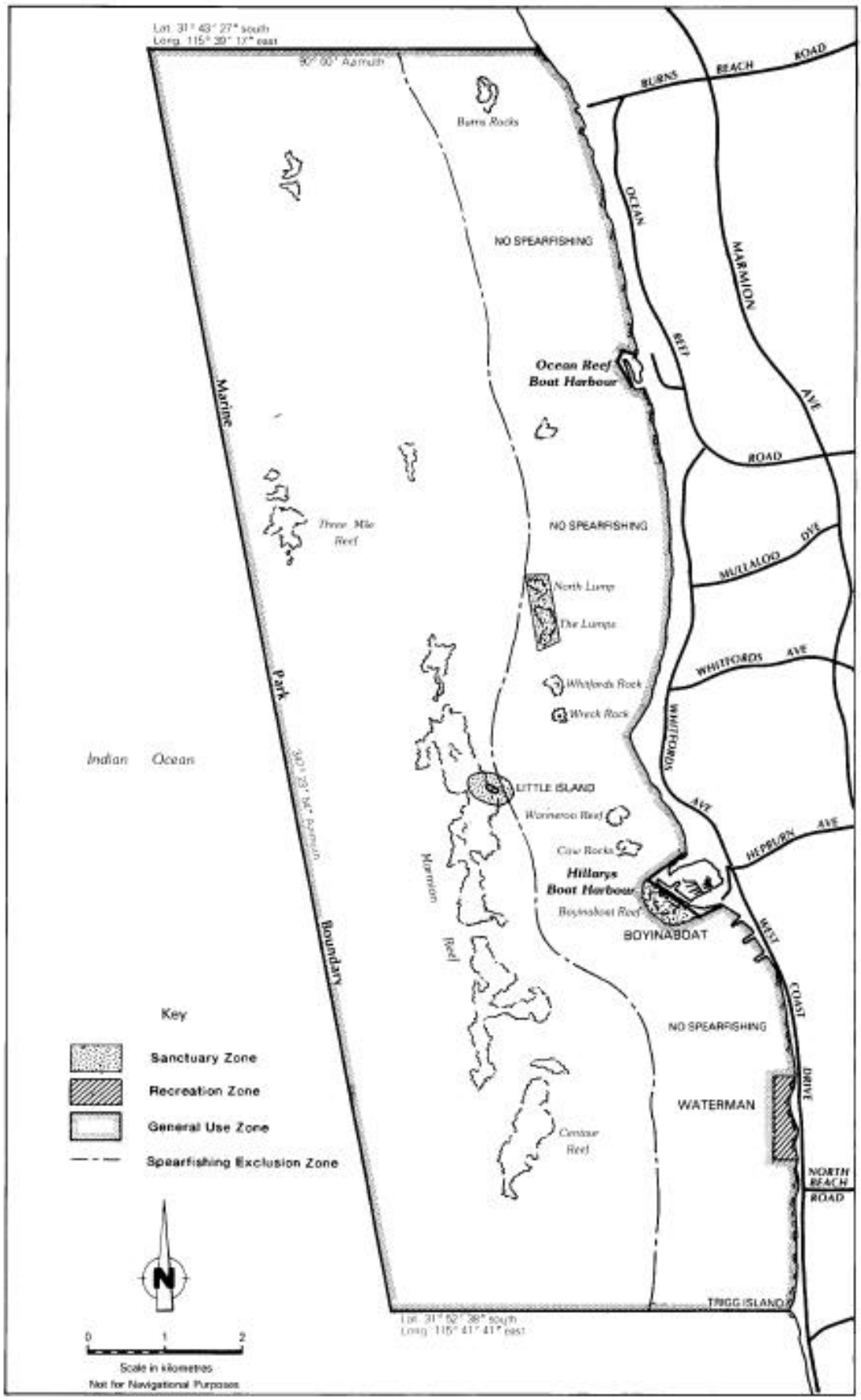
The zones to be applied in the Park for the term of the plan are shown in Map 2. Permitted uses in each zone are fisted in Table 1.

TABLE 1. PERMITTED USES IN EACH ZONE

	Sanctuary Zone	Recreation Zone	General Use
Commercial Fishing			
Trawling	No	No	No
Rock Lobster Potting	No	No	Fisheries Licence*
Abalone	No	No	Fisheries Licence*
Netting	No	No	Fisheries Licence*
Collecting (aquaria)	No	No	No
Commercial Activities Other than Fishing			
Dive and Fish Charters	)		
Motorised Water Sports	)	Tendered or Assessed	
Non-motorised Water Sports	)	on Application	
Organised Events	)		
Recreation Fishing			
Rod and Line Fishing	No	Yes*	Yes*
Netting	No	No	No
Collecting (aquaria)	No	No	No
Spearfishing	No	No	Restricted
Spearfishing on Compressed Air	No	No	No
Rock Lobster Fishing	No	No	Yes*
Abalone	No	No	Yes*
Other			
All Research	Permit	Permit	Permit
Placement of markers	Permit	Permit	Permit
Dredging	No	Permit	Permit
Blasting**	No	No	No

* As per regulations and requirements of the Fisheries Act.

** Application, on a small scale, of an appropriate cutting charge for clearing pipes associated with the Watermans Marine Research Laboratories maybe allowed, subject to NPNCA approval.



Map 2. Zoning Plan for the Marmion Marine Park
Sanctuary Zone boundaries are approximate and subject to survey.

Sanctuary Zones

- Little Island Sanctuary Zone: encompasses the low limestone reef adjoining Little Island, and includes scattered seagrass beds and high limestone reef communities on the outer reef. Little Island is a sandy island used as a resting site by sea birds and Sea-lions.

- The Lumps Sanctuary Zone: encompasses the limestone reefs known as 'Me Lumps and North Lumps, and includes inshore limestone reef communities surrounded by extensive seagrass beds.

- Boyinaboat Sanctuary Zone: a popular recreation site located immediately west of Hillarys Boat Harbour. Any recreational impacts are likely to be detrimental to the inshore reef. The boundary of this zone will exclude an area along the breakwater to allow for fishing at this popular site.

These zones serve as special viewing areas where flora and fauna may be observed free of interference, special protection areas for wildlife, reference areas for scientific study, and replenishment areas which may provide recruits to re-populate depleted areas.

Recreation Zones

- Waterman Recreation Zone: the area known as the Waterman Observation Area is located along the shore either side of the Waterman Marine Laboratory and extends approximately 500 m to sea.

Recreation is a priority use for the majority of the Park, particularly within 1 800 m of the coastline. However, as there is periodic commercial rock-lobster and abalone fishing, this category has been confined to the one small area.

General Use Zone

This zone covers the remainder of the Park. Management of recreational use will be a priority throughout the majority of the Park, subject to current regulations. There are restrictions, however, on spear-fishing, netting and collecting (Table 1).

Management of commercial fishing within this zone will be under the authority of the Fisheries Act and limited to rock-lobster potting, abalone harvesting and restricted beach seine fishing (see 20.0 Commercial Fishing).

REVIEW OF ZONES

Many submissions to the draft management plan were concerned about zoning, particularly the location and extent of sanctuary zones. The zoning scheme will be reviewed early in the plan period in order to increase the total area in sanctuary zones, and include onshore reef (such as the Waterman area) and outer reef, as these habitats are either not represented or poorly represented. All interested people will have the opportunity to comment on the proposed scheme through an amendment early in the life of this plan (see 32.0 Review).

Actions

1. **Implement the zoning scheme as the basis for integrated management of the Marine Park. Survey zone boundaries based on ecological and management considerations.**

2. **Proclaim regulations to manage activities and use in the Park consistent with the intention of the zoning plan.**

3. **Review the zoning scheme early in the life of the plan.**

9.0 INTERAGENCY RESPONSIBILITIES

The objective is to ensure integration of management programs between CALM and other agencies with management responsibilities in, and adjacent to, the Marine Park.

Under the provisions of the Conservation And Land Management Act (1984), CALM is responsible for management of marine parks. In addition, other agencies also have management responsibilities.

Amendments to the CALM Act (November, 1988) confirm that Fisheries Regulations apply in marine parks. Control of fishing methods, size and bag limits, and fishing zones are regulated under the Fisheries Act and are managed in collaboration with the Fisheries Department.

The Department of Marine and Harbours is responsible for boating in the Ocean Reef boat launching facility, in Hillarys Boat Harbour, and in the Park's navigable waters. It is also responsible for the general safety of coastal marine traffic. Further, water skiing in the designated area, prohibited

anchoring in the region of an OTC cable, and boating restrictions at Bums Beach are enforced by the Department of Marine and Harbours.

The Fremantle Port Authority boundary overlays the southern part of the Park. This Authority regulates commercial shipping and is responsible for contingency plans for oil spills.

Management of the coastal land adjacent to the Marine Park is the responsibility of the Wanneroo and Stirling city councils, operating under the City by-laws.

The ongoing management, monitoring and public education duties required for effective control of the Marine Park, are CALM's responsibility. However, the relevant Acts listed below, and their administration, is the responsibility of the appropriate Departments. Close consultation is needed to ensure ongoing management.

The Marmion Marine Park Consultative Committee was established by CALM to provide a communication mechanism between CALM and agencies involved in the Park to assist formulate the management plan. The Consultative Committee, with representatives from both local and State Government agencies, has been very successful and this liaison should be continued.

Acts of Parliament that have a direct bearing on the establishment and administration of the Marine Park are summarised below according to the relevance of the Act to the area.

(i) Conservation and Land Management Act 1984 and Wildlife Conservation Act 1950: provide for conservation of flora and fauna and their habitats, and for management of certain land and waters. The CALM Act also enables proclamation of marine nature reserves and marine parks.

(ii) Fisheries Act 1905: provides for the regulation of professional and amateur fisheries, and their management by the Fisheries Department.

(iii) Marine and Harbours Act 198 1: provides for the advancement of efficient and safe shipping and effective boating and port administration.

(iv) Western Australian Marine Act 1982: provides for the regulation of navigation and shipping.

(v) Fremantle Port Authority Act 1902-1969: provides for the regulation of commercial shipping and oil spills. Regulation of small craft in the area covered by this Act is delegated to the Department of Marine and Harbours.

(vi) The Commonwealth Historic Shipwrecks Act 1985 and the State Maritime Archaeology Act 1973: provide protection for specific shipwrecks declared under the Commonwealth Act and blanket protection for all wrecks over 75 years old.

(vii) Local Government Act: The City of Stirling and City of Wanneroo both have bylaws which prohibit or restrict certain activities in specific areas of the coast, including exercising of animals, nude bathing, spearfishing, and use of off-road vehicles.

(viii) Jetties Act 1926: provides for the regulation, location and structure of jetties.

Actions

1. **Establish a Memorandum of Understanding between the Fisheries Department and CALM that set down guidelines and procedures for management of the fishery-related activities in the Park which will be administered under the Fisheries Act.**

2. **Establish a Memorandum of Understanding between the Department of Marine and Harbours and CALM for management of boating and other regulations administered by the Department of Marine and Harbours. Include the definition of management responsibility in the waters immediately adjacent to, and outside, the boat harbour breakwaters.**

3. **Liaise with relevant agencies, including the Cities of Stirling and Wanneroo, to ensure integrated management of the coast and the Park.**

4. **Continue to convene the Marmion Marine Park Consultative Committee, or a similar committee, and revise the structure and membership as necessary.**

10.0 ADJACENT LAND MANAGEMENT

The objective is to ensure that management of land adjacent to the Park is coordinated with management of the Marine Park.

Recreational use of the coast is increasing rapidly, and planning and management is required if environmental, social and economic values of the coastal region are to be retained. Foreshore areas

are governed by management plans produced by the City of Stirling and the City of Wanneroo. No documented management strategy for recreational activities exists for the Hillarys Boat Harbour. Management of onshore facilities and/or developments is discussed in Section 24.0.

Natural areas adjacent to the Marmion Marine Park may be more appropriately managed by CALM. If so, consideration should be given to reserving the land as a conservation reserve (under the Land Act) to be managed as an integrated unit with the Marine Park. The management of natural areas in the Region Scheme is being evaluated by an interagency taskforce convened by CALM. These areas should be given serious consideration in this study.

Actions

1. **Ensure management of coastal reserves complements Park management. Liaise with the City of Stirling, the City of Wanneroo, the Department of Marine and Harbours and other relevant agencies on a regular basis, via the Consultative Committee and informal means.**

2. **Investigate reserving suitable natural areas as conservation reserves to be managed by CALM. Integrate management of these areas with management of the existing Marine Park.**

CONSERVATION

11. Principal Conservation Directions
12. Climate and Oceanography
13. Geology and Geomorphology
14. Hydrology
15. Coastal Processes
16. Marine Biota
17. Terrestrial Biota

11.0 PRINCIPAL CONSERVATION DIRECTIONS

CONSERVATION GOAL

Conserve all aquatic and terrestrial plant and animal species and communities, and the natural processes that sustain them, and the physical, cultural and scenic resources.

OBJECTIVES

1. **To conserve all biological, physical, scenic and cultural resources.**
2. **To protect the natural environment from adverse impacts resulting from recreational and commercial use of the Park.**
3. **To promote conservation values in interpretation and education programs.**
4. **To foster ongoing research and monitoring programs to aid future management.**

STRATEGY

Given the complexity of the marine ecosystem and the limitations of available knowledge, a cautious approach to management will be adopted.

This plan recognises that appropriate conservation management of the Park's natural attributes will be attained by the stringent management of recreational and commercial activities in the Park. Ongoing research and monitoring programs will be encouraged to aid future management of the Park. A number of Acts of Parliament have direct bearing on the administration of the Marine Park (see 9.0 Interagency Responsibilities) and, consequently, effective regulations for activities in the Park are in place. In conjunction with this management plan, the enforcement of these regulations will provide for the conservation management of the Park's resources.

Descriptions of various aspects of the natural environment in the Park area are contained in separate technical reports, (DCE, 1986; EPA, 1987). Summaries of available data can be found in the City of Stirling Coastal Report (City of Stirling, 1984), reports on the Wanneroo Coast (Woods, 1984a, 1984b), the Environmental Review and Management Programme (ERMP) for the Sorrento Boat Harbour (PWD, 1985), which is now known as the Hillarys Boat Harbour, and in the EPA's assessment of the Sorrento Boat Harbour ERMP (EPA, 1985).

Only detail relevant to the management of the area's natural environment is provided in this plan.

12.0 CLIMATE AND OCEANOGRAPHY

The Park area experiences hot, dry summers and mild, wet winters. Air temperatures are similar to those in Perth, where mean daily maximum temperatures vary from 30.3•C in summer to 17.6•C in winter. Mean daily minimum temperatures are 18.6•C in summer and 9.1•C in winter. Rainfall is moderate (about 880 mm/year) and falls mainly in May through to October. Evaporation in the region is high (about 1980 mm/year).

Winds

The dominant climatic factor is the wind, which generates waves, induces water circulation and transports sand inland. The wind regime in the area is similar to that at Fremantle (Steedman & Craig, 1979, 1983). A diurnal wind variation persists throughout the year, but intensifies during the summer. In winter, winds are predominantly 'offshore' at night and in the morning, and 'onshore' in the afternoon. In summer, the sea breeze/land breeze pattern is stronger, and acts additionally to a persistent southerly airstream, so that the resultant wind blows from the southeast at night and in the morning and from the southwest in the afternoon. The passage of low pressure systems in winter brings northwest winds and gales that back to the west and southwest. The strongest winds blow from the southwest.

Dissipating tropical cyclones can affect the coast during summer, bringing wind gusts up to 70 knots (35 m/s). Though these cyclonic events are of short duration, associated winds and high energy waves can have a marked effect on the coast.

Waves

The Park area is subject to a prevailing, refracted, long period (8-12 sec) southwest-west swell that is continually generated by storms and the "Roaring Forties" in the Indian Ocean. The swell is further refracted, reflected and diffracted as it passes through the reef chains.

Superimposed on the swell are locally generated, short-period (4-6 sec) wind waves. During summer, southwest waves are generated by the reinforced sea breeze; during winter, high energy waves are generated during northwest and westerly gales. The occasional summer cyclone may also generate waves from the north, west or south.

Depending on the prominence of the adjacent islands and reefs, wave energy reaching the coast may vary markedly from place to place, with different parts of the coast being subject to swell, waves, swell and waves, or waves with damped swell. The prominent reefs off Mullaloo Point have had a marked influence on the swell, with the result that the area behind the reef complex has been the site of major accumulation of Holocene sands (see 13.0 Geology and Geomorphology).

Circulation

Water movement on the inner continental shelf off Perth is driven mainly by wind stress; the presence of a regional current is also evident during calmer periods (Hearn, 1983). Water generally flows northward in summer and southward in winter. In the shallow, nearshore waters of the Park area, the local wind driven currents become more dominant relative to the regional water movements. Mean current speeds in the range of 0.05-0.1 m/s are typical (Steedman & Associates, 1976).

The complex chains of reef within, and adjacent to, the area act as partial barriers, restricting exchange between inshore and offshore waters. Under stable wind conditions, local circulation patterns are established as a result of the interaction between the wind stress forces, and sea floor topography. For example, during prolonged easterly winds, shallow water over Lal Bank is driven westward, inducing circulation that replaces nearshore water with offshore water (Hearn, 1983). Wind-induced circulation is an important flushing mechanism for the Park area, and may also affect the water temperature regime experienced by reef-dwelling communities. During prolonged calm periods, some flushing of the area is still maintained by the regional current.

Water replacement time in the Marmion Lagoon is estimated to be of the order of one day (Hearn, 1983), although under extended calm conditions, replacement may take up to four or five days.

Tide and Sea Changes

The Wanneroo coast generally experiences one astronomic tide per day, though barometric pressure, prevailing wind direction and seasonal changes are also responsible for changes in water level. The normal tidal range is about 0.5 m, though the range in water levels, during a year due to all factors, is of the order of I m. Future planning must consider possible sea level changes as a result of 'Greenhouse' predictions.

Action

Recognise the likely effects of high winds and associated high energy waves on the coast line, and on any future developments in the Park.

13.0 GEOLOGY AND GEOMORPHOLOGY

The Park area is underlain by Tamala limestone, which is covered partially by yellow quartz sand and the younger carbonate-rich Becher and Safety Bay Sands. Tamala Limestone was deposited during the Pleistocene period (1.5 - 1.8 million years ago) as a series of parallel beach and dune sand ridges. Since deposition, these sediments have cemented into a porous limestone that incorporates solution

pipes and dense hard capstone layers. The Becher and Safety Bay Sands were deposited during the Holocene, which covers the period of the last 10 000 years. The upper Safety Bay Sands, which comprises beach, beach ridge and dune sediments, formed in the subaerial environment. The underlying Becher Sands formed beneath seagrass cover.

The area is characterised by a series of limestone ridges, the largest of which forms the mainland coast. Offshore, three lower ridges form broken chains of islands and reefs that are separated by linear depressions. Two chains of reefs display numerous, complex underwater structures, including cliffs, caves, solution pipes and platforms. South of Sorrento and north of Mullaloo the mainland ridge has been eroded to form cliffs and wave-cut platforms (the onshore reefs), with rocky headlands separating small sandy bays. The nearshore reefs are about 1 km from the coast, with the offshore reefs about 4 km offshore.

Superimposed on the limestone basement area are a number of landforms associated with the younger sandy sediments. Between Sorrento and Mullaloo, a submarine bank (Lal Bank) has partitioned the nearshore depression into two discrete marine basins or lagoons (Marmion Lagoon to the south and Whitford Lagoon to the north).

Adjacent to Lal Bank, the mainland ridge is covered partially by a veneer of transgressive dunes which are stabilised by vegetation. The bank itself is partially covered by a prograded beach ridge plain (Whitford Plain) which is roughly triangular in shape, and which protrudes about 1.2 km beyond the general seaward margin of the mainland coast. The southern half of the plain, which is fronted by a narrow beach and steep dune cliff, is covered by stabilised transgressive dunes. In contrast, the northern half of the plain is lower and beach ridges, which mark successive shoreline positions during growth of the plain, are visible from the ground and from the air. A wide sandy beach exists between the Hillarys Boat Harbour and Ocean Reef launching facility.

Action

Incorporate information on geological processes and geomorphological features in interpretation and **education programs.** Develop **interpretive potential of underwater limestone formations and transgressive dune systems.**

14.0 HYDROLOGY

Sea Water

Mean monthly sea water temperatures in the Park peak at 21-22•C between January and April, and fall to a minimum of about 17•C during July to September (Pearce *et A* 1984). There can be a significant drop in sea water temperature very close inshore during early winter, because of direct loss of heat to the atmosphere.

Annual sea water salinity ranges from 36.1 gm/litre in late summer to 35.3 gm/litre in late winter. The salinity peaks and troughs closely coincide with those of annual sea water temperature fluctuations. Within a few hundred metres of the shore, there is local lowering of salinity due to submarine groundwater discharge. Under calm conditions, a low salinity surface layer, extending further offshore, is formed.

Dissolved nutrient concentrations, in the waters of the Park area, are presently low and in the range of concentrations generally reported for temperate coastal waters (Pearce *et al*, 1984). Dense phytoplankton blooms have not been observed (Johannes & Heam, 1983), except for blooms of the blue-green alga *Trichodesmium* (Creagh, 1985). Nevertheless, nitrate concentrations in groundwater discharged into the Park area, are two orders of magnitude greater than ambient concentrations in the receiving sea water. The nitrogen load from groundwater discharge to the Marmion Lagoon is estimated to be about half of the requirement for the observed growth of the lagoon's macrophytes (Johannes & Hearn, 1983). Whitford Lagoon receives nutrients from groundwater discharge, and also from the Beenyup (Ocean Reef) secondary treated effluent outfall, located about 1.6 km offshore from the Ocean Reef boat launching facility. The effects of nutrients from both sources have not yet been fully investigated.

Groundwater

Potable groundwater is found within an unconfined aquifer in the Tarnala Limestone. The limestone is very permeable and consequently the water table gradient is low. Allen (198 1) estimated that the groundwater is moving towards the coast at a rate of 90 m/year. It is probable that the limestone aquifer is contiguous with that found in the Safety Bay Sands beneath the Whitford Plain.

As the aquifer is located under an area of increasing urbanisation, and recharged from rainfall, it is susceptible to changes in surface runoff and to pollution from nutrients, pesticides, hydrocarbons and other chemicals. The aquifer is extensively used for irrigation of domestic gardens and municipal reserves.

Actions

1. **Maintain liaison between the Water Authority, EPA, City of Wanneroo and CALM to minimise detrimental environmental effects of outfalls.**

2. **Ensure that further monitoring and evaluation of nutrient input is undertaken to quantify the ecological effects of the nutrient discharge from the Beenyup Treatment Plant, and to enable a prediction to be made of the likely levels of nutrients that will discharge in groundwater (see 26.9 Drainage and Discharge).**

3. **Co-ordinate monitoring and research programs being undertaken by State agencies, CSIRO and tertiary institutions.**

15.0 COASTAL PROCESSES

Complex interactions between wind, waves, hydrology and geology are always occurring in coastal processes that continuously shape the coastline.

Swell-induced onshore transport occurs in a complex zone of swell wave interference behind the Marmion reefs. This has led to major movement of sediment from the reefs to the mainland coast to form Lal Bank, Whitford Plain and the transgressive dunes that overlay the mainland ridge. At present, minor onshore transport is evident as a thin plume of sand moving across the seagrass covered bank.

In the surf zone, swell-induced longshore transport moves sand towards the zone of onshore transport behind the Marmion Reefs. This has minimised longshore sediment losses from within the Park area and has been dominant in maintaining the triangular shape of Whitford Plain. Local wave-induced longshore transport in the surf zone moves sediment northward in summer, especially along the shore between Sorrento and Mullaloo Point, and along the rocky coast immediately north of Mullaloo. In contrast, during winter, transport is southwards especially between Ocean Reef and Hillarys where the coast erodes each winter. Owing to the dominance of the summer wind-wave regime, there is a net movement of sediment northwards. This has led to modification of the swell-controlled shape of the Whitford Plain.

Wind transport which blows sand inland on coasts exposed to south-west and westerly winds is also an ongoing coastal process. With the exception of the 'Little Desert' north of Mullaloo there is, at

present, little wind transport except in the areas where human activity has degraded dune vegetation or the dune scarp behind the beach. The presence of large, vegetated and stabilised transgressive dunes, however, is evidence of previous periods of major wind transport.

Seasonal recycling of beach and foredune material to an offshore bar also occurs, especially along the sandy coast between Hillarys and Mullaloo.

Longer-term (hundreds of years) changes in coastal processes and sand supply, have led to periods of erosion or stability during the long-term progradation of the Whitford Plain. Whether these changes are cyclical or random is not clear, nor are the periods between each change. Long-term evolution of the sandy coastal landforms is leading to major changes in shoreline position. It is evident that the sandy Whitford Plain prograded, until about 1000 years ago, when the southern flank commenced eroding. As this is probably related to a long-term decline in sand supply, this process is likely to continue. Although this process is slow, it must, as demonstrated by beach erosion at Sorrento and Mullaloo, be taken into account in planning for coastal structures which have design lives of a decade or more (Semeniuk and Searle, 1985).

Action

Consider the long-term effects of coastal processes, in particular beach erosion, when planning for coastal structures which have design-lives of a decade or more.

16.0 MARINE BIOTA

The Park has a high habitat diversity due to the variation in geomorphology, substrate, water depth, and exposure to wave energy and light.

These habitats may be classified into five broad categories2:
(i) Lagoon Subtidal Sandy Sea Floor
The predominant substratum in this habitat consist of calcareous sand plains, stabilised by seagrasses and interspersed with areas of bare sand. The seagrass meadows (mainly *Posidonia* spp, *Amphibolis antarctica* and *Halophila ovalis*) support a diverse assemblage of animals, and are important as a food source, refuge and nursery for echinoderms, molluscs, crustacea and fish.

(ii) Lagoon Subtidal Limestone Pavement

This habitat occurs in the less sheltered areas of the Marmion and Mullaloo lagoons, with limestone pavement and consolidated sand substrata. The seagrass meadows *(Amphibolis antarctica, Poisidonia* spp, and *Halophila ovalis)* occur, but are less extensive than in the more sheltered areas. Attached seaweeds, especially the macrophytes (for example, *Caulerpa cactoides, Ecklonia radiata,* and *Hypnea episcopalis)* are common on the limestone pavement.

(iii) Lagoon Intertidal Reefs and Little Island

Isolated patch reefs occur in the lagoons (for example, Wanneroo Reef). The reef tops have areas of essentially bare rock populated with small gastropods, limpets, coralline algael/*Haliotis* associations, or a mixed algal assemblage which is determined in part by the reef height relative to low tide level and the aspect of the reef Vertical faces of these reefs are covered with the macroalgae *Ecklonia radiata* and *Sargassum sp.* Overhangs, shaded walls and the roofs of caves are covered densely with a diverse sponge/ascidian/gorgonian/bryozoan assemblage, and grazed by molluscs and several species of starfish. The large predatory baler shell, *Melo miltonis,* occurs in the sand adjacent to the undercut caves and feeds on other molluscs buried in the sand, and on the abalone *Haliotis roei.* Hard corals (Order: Scleractinia) such as Montipora, Favia, Favites, Goniastrea, Plesiastrea and Symphyllia occur on the reefs around Cow Rocks and Wreck Rock, while *Pocillopora damicornis is* moderately common on outer reefs near Little Island. Little Island provides a resting site for seabirds (gulls, tems, cormorants and others) and Sea-lions. Bridled Terns have bred there occasionally.

(iv) Nearshore Reefs and Intertidal Onshore Rock Platforms

Attached macrophytes are dominant on these reefs with red algae *(Dictymenia sonderi, Hypnea episcopalis,* and *Vidalia spiralis)* and brown algae *(Ecklonia radiata, Lobospira bicuspidata)* being most common. The abalone, *Haliotis roei,* and the turban shell, *Turbo torquatus , are* common in these habitats.

(v) Offshore Shallow Limestone Reefs

This habitat found on the seaward slopes of the Marmion Reef/Three Mile Reef complex, is characterised by marked algal zonation related to water depth. In the shallower region, algae adapted to high illumination, such as Sargassum, are common. Below about 2m, dense stands of kelp, *Ecklonia radiata,* and an associated sub-canopy of encrusting coralline algae, dominate. The density of kelp plants decreases with depth down to 25m, at which point epilithic seagrass *(Thalassodendron* sp.), red algae and sponges predominate.

2. The following information on the benthic marine communities is derived from DCE field surveys and from a submission by the Western Australian Museum.

To date, 136 species of fish from 70 families have been identified in the Park. The common fish species caught in the Park area, and their habitats, are shown in Table 2. Information on habitat preferences of common fish species was supplied as part of the submission by the Fisheries Department. New species may be found in the Marine Park. Many species are restricted in number and/or geographical distribution and their presence can go undetected.

Marine mammals are conspicuous members of the marine biota associated with Marmion Marine Park. Small numbers of the Australian Sea-lion (declared 'in need of special protection') can be found on Little Island and Bums Rock. The majority of these are males which grow up to 4m long and weigh about 300 kg. The remnants of a heavily exploited humpback whale population migrate through Park waters, mostly between August and October each year. These huge mammals spend the winter months in tropical latitudes where they calve and breed. They move through the Park as they follow the continental shelf south to feeding grounds in Antarctica.

Bottlenose dolphins are the most prominent dolphin species to occur in the Marine Park. One major pod of these animals appears to have its home range or territory in the area and can be seen regularly. Striped dolphins may visit the area once or twice a year.

TABLE 2.

Fin Fish Species Commonly Caught in the Area and Their Preferred Habitats (from Fisheries Department submission)

FIN FISH	HABITAT
Garfish	Coastal waters over seagrass.
Western school whiting	Sandy bottoms in surf zone and offshore.
Tailor	Juveniles school in surf zones. Larger fish around offshore reefs.
Australian herring	Around coastal reefs - over seagrass areas.
Skipjack trevally	Coastal reef areas.
Yellowtail scad	Surf zone to offshore reefs. Active at night.
Wrasses (several species)	Mostly in association with coastal reefs.
Cobbler	Coastal reef and weed areas. Juveniles associated with nearshore drift macrophytes. Adults feed in the surf zone.
Sea trumpeter	Adults in seagrass beds. Juveniles associated with shoreline drift macrophytes.
Western sand whiting	Surf zone sand, particularly around reefs.
Red mullet	Sand/seagrass areas.
Buffalo bream	Around coastal reefs.
Yellow-eye mullet	Surf zone.
Leather jacket	(several species) Common over seagrass beds.
Blowfish	Inshore sandy bottoms, but also seagrass and reef areas.
Snook	Offshore weed beds.
Shark species	Offshore roving species throughout the water column
Westralian jewfish	Around reef areas.
Sea mullet - migratory	Just off surf zone.
Australian salmon - migratory	School around offshore reefs and surf zone.

Actions

1. **Recognise the importance of the -rive major habitat types in all management operations.**

2. **Provide information on the marine biota as part of interpretation and education programs.**

3. **Continue to refine management practices by researching and monitoring the basic ecology and oceanographic processes in the Park. Approved research programs will be authorised by permit.**

4. **Ensure monitoring of fish populations receives a high priority in Park waters. Liaise with the Fisheries Department.**

5. **Minimise detrimental effects of recreational and commercial use on major habitats, particularly the small area of high reef habitat, through appropriate promotion of information and education, and enforcement of Park regulations.**

6. **Develop and implement monitoring programs to determine the status of marine mammal populations in the Park and the possible influences of increasing recreational use on those populations.**

17.0 TERRESTRIAL BIOTA

Vegetation in the coastal zone within the area is similar to that found elsewhere along the Perth metropolitan coast. Generally, it comprises Spearwood Sands heath and Quindalup Dunes scrub. The vegetation of the Spearwood Sands is a low, closed scrub, usually less than 1m high due to exposure and salt pruning. It is comprised of mat-like succulent plants, such as *Carpobrotus* or *Tetragonium,* and compact, closely branched shrubs such as *Olearia* or *Angianthus.* The Quindalup Dunes are the most recent dune system along the metropolitan coastline. The vegetation of the dunes consist of salt-tolerant colonisers such as *Cakile maritima* and *Arctotheca populifolia,* mat plants and spreading grasses such as *Spinifix* and *Tetragonium,* and bush scrubs such as *Olearia* and *Scaevola.*

Little is known about past or present wildlife in the area, although enquiries of Government agencies and interested organisations indicate that the area does not appear to contain any known threatened species.

It is now recognised that within the metropolitan area, coastal habitats are rapidly diminishing and there are good reasons to conserve representative examples in sufficiently large areas to ensure viability of their fauna and flora.

Several species of sea birds, including gulls, terns and cormorants, use the shore and offshore islands as resting and/or breeding sites. Sea-lions are sometimes seen basking in the sun also. Some species of migratory birds are protected under international treaties signed by the Commonwealth Government. These treaties include: Convention on International Trade in Endangered Species (CITES); Japan-Australia Migratory Birds Agreement (JAMBA); and China-Australia Migratory Birds Agreement (CAMBA).

Action

Liaise with adjacent land managers to ensure remnant coastal biota are protected and managed in a manner complementary to Marine Park management.

RECREATION AND COMMERCIAL USE

18. Principal Recreation and Commercial Directions
19. Recreational Activities
20. Commercial Fishing
21. Commercial Concessions
22. Aircraft
23. Marketing and Promotion
24. Facilities and Development

18.0 PRINCIPAL RECREATION AND COMMERCIAL DIRECTIONS

RECREATION AND COMMERCIAL GOAL

Facilitate public enjoyment and commercial operations in a manner that is compatible with conservation of the natural environment and minimises conflict between users.

OBJECTIVES

1. **Encourage Park users to adopt conservation ethics regardless of their activity.**
2. **Promote and give priority to recreational experiences that are based on an appreciation and understanding of the natural resources.**
3. **Promote recreational opportunities that enhance the quality of visitors' experiences, and are consistent with maintaining environmental values.**
4. **Closely integrate recreation experiences with interpretation and education programs.**
5. **Ensure all developments and activities do not detrimentally affect species, populations, habitats, natural features and cultural and scenic values.**
6. **Ensure use is equitable by not impairing other form of use to an unreasonable extent.**
7. **Ensure recreation is in accordance with the CALM Recreation policy and guidelines set out in the CALM manual.**
8. **Manage recreational and commercial fishing in order that fish populations and their environment are not adversely affected.**
9. **Ensure commercial concessions promote an appreciation of the natural environment and complement CALM's interpretation programs.**
10. **Ensure commercial concessions do not adversely affect the environment, increase visitor pressure to an unreasonable extent, or detract from the reasonable enjoyment of the Park by the public.**

STRATEGY

This plan recognises that appropriate conservation management is primarily achieved through the effective management of recreational and commercial activities in the Marine Park. The Park has a range of recreational and commercial opportunities making it a much valued resource. For this reason, some restrictions are necessary to conserve the natural resources which make the Marine Park attractive. It is also important that conflict between users is minimised. Commercial and recreational fishing in the Park is monitored by the Fisheries Department in consultation with CALM.

In general, non-consumptive activities (for example, diving) will be given preference to consumptive activities (for example, fishing), and recreation use will be given preference to commercial use. This will be based on the impact of the specific type of use on the Marine Park's values.

19.0 RECREATIONAL ACTIVITIES

19.1 RECREATIONAL FISHING

Recreational fishing is an important activity in the Park. Beach and rock fishing are popular along the coastline. Fishing from boats or from the shore in the General Use and Recreation Zones is available in most of the waters in the Park. An aim of management is that fish stocks be maintained and species that are restricted in abundance or distribution be protected. Recreational fishing will be prohibited in the Sanctuary Zones.

Certain species of molluscs and crustaceans commonly taken for consumption are treated as fish for the purposes of this plan. Appendix 1 lists fish species that may be taken for consumption from Park waters, as per Fisheries Act Regulations.

Some fishing methods are considered to be environmentally damaging, or to cause such disturbance to fish communities that other Park users are disadvantaged. Spearfishing can cause rapid stock depletion in accessible areas and cause conflict with the recreation experience of other divers. Spearfishing is excluded from the areas zoned Sanctuary and within 1800 metres of the shoreline to enable an assessment of the full impact of this activity and to maintain areas of high use free from conflicting use.

Wilson, Hancock and Chittleborough (1979) suggest that netting and other human pressures may have reduced fish stocks in the Swan River during the early development of Perth, but there is no detailed scientific study on the impacts of net fishing in the inshore coastal waters of Western Australia.

Net fishing in the past has caused some interference and concern to other recreational users in the Park's waters. The non-selectiveness of net fishing is not within the conservation objectives of management, and presently there is a total ban on all amateur netting within the Park, excepting the use of drop nets for crabs.

Recreational fishing is controlled under the recreation fishing regulations of the Fisheries Act. Current bag limits which apply generally, also apply within the Park. As research and monitoring proceeds it may become apparent that the current bag limits need revision if the recreational fishery is to be maintained at present levels. Recreational fishing in high-use areas, where there are a number of competing and conflicting uses, may require restrictions to minimise conflicts.

Actions

1. **Regulate recreational fishing in the Park according to the fishing regulations proclaimed under the Fisheries Act, in consultation with CALM. Advise the public through appropriate means.**

2. **Ensure monitoring of fish populations is undertaken to ensure sustainable use. Liaise with the Fisheries Department.**

3. **Seek proclaimation of fishing regulations, if necessary, to provide protection to any species of fish shown to be in need of special protection.**

4. **Seek proclaimation of bag limits specifically for the Park, as necessary.**

5. **Prohibit recreational fishing in Sanctuary Zones.**

6. **Allow recreational fishing in the Park using hand held rods, lines with no more than three hooks attached (a flight of ganged hooks counts as one hook), rock lobster pots and drop nets for crabs. Prohibit the use of traps, set-lines or nets and spearfishing using compressed air.**

7. **Prohibit use of gidgees, hawaiian slings, spearguns or any form of spear, defined under the Fisheries Act, within 1 800m of the shore and in Sanctuary Zones. Prohibit competition spearfishing in the Park.**

8. **Prohibit fish aggregating devices (FADS) in the Park.**

9. **Allow for charter boat operations providing services for recreational fishing by permit, issued by CALM under standard concession arrangements.**

19.2 COLLECTING

Abalone

Seasonal abalone fishing by amateurs is determined by the Fisheries Department in consultation with CALM. The history of abalone collecting from onshore reefs in the Park shows suspended and early closures of seasons, commercial fishing concerns, community tension, unsafe practices and media interest. Recent seasons have been restricted and some have been closed completely. Educational programs have been developed to aid management.

Live Specimens

Collection of live animals from the Park, particularly molluscs and aquarium fish, is believed to have a dramatic impact, detracting from the Park's recreational and educational experiences. All species of molluscs occurring in the Park can be found outside the Park boundaries. Some species are vulnerable to exploitation beyond their natural capacity to sustain viable populations and are in need of protection.

Actions

1. **Ensure that abalone stocks and the impacts of collecting are monitored to ensure sustainability.**

2. **Ensure that appropriate management strategies, enforcement and education capabilities are assessed annually prior to consideration of declaration of the season.**

3. **Determine the restrictions and limitations of abalone harvesting within the Park on an annual basis and after consultation between CALM and the Fisheries Department.**

4. **Prohibit the collection of any live animals, other than for personal consumption, except by permit. (Species which may be taken alive for personal consumption are listed by gazettal notices and are subject to size and bag limits according to the recreational fishing regulations (see Appendix 3)).**

5. **Provide for the collection of live mollusc shells or other invertebrates for genuine educational and study purposes by permit, in accordance with the Wildlife Conservation Act.**

6. **Prohibit collecting in Sanctuary Zones except for scientific purposes.**

19.3 DIVING AND SNORKELLING

The sheltered reefs and wide diversity of biota in the area attract many divers and snorkellers. Activities such as marine observation, underwater photography or diving skill exercises have minimal impact on marine environments and will be encouraged in the Park.

SCUBA diving within the Park is rapidly increasing. Owing to the numbers of boats in the Park, the safety of divers and snorkellers in some areas is of concern. An underwater nature trail has been developed in the Park. Amateur divers have assisted in fauna surveys.

Actions

1. **Establish snorkel and SCUBA dive trails in suitable areas.**

2. **Provide information on marine natural history and where possible, guided tours by appropriately trained staff or volunteers.**

3. **Establish procedures for the recovery and treatment of diving accident victims within the Park in accordance with approved practices.**

4. **Develop a code of ethics for all divers/snorkellers with emphasis on conservation and safety (for example, use of dive flags).**

5. **Require commercial dive tour operators to obtain a concession permit, and to adhere to the code of ethics for diving in the Park (see 21.0 Commercial Concessions).**

6. **Investigate ways to improve access to reefs suitable for diving and snorkelling. For example, provide diver access to Boyinaboat reef from the southern breakwater of Hillarys Boat Harbour. Liaise with the Department of Marine and Harbours and other relevant agencies.**

19.4 BOATING

Small boats can be launched from a number of locations along the coast adjacent to the Park. Many vessels and larger boats travel through Park waters to other destinations. Up to 1000 vessels have been launched in Park waters in a day.

The use of boats has increased dramatically in recent years. It is important that management is able to respond to the varying needs of boat owners. The capacity to manage boating activities, including the provision of boats and qualified staff, will need to be assessed at regular intervals.

Actions

1. **Provide information for boat users on safety requirements, conditions at sea and boating ethics as they pertain to the Park.**

2. **Ensure boating equipment and safety standards, set by the Department of Marine and Harbours, are encouraged (in accordance with the Marine and Harbours Act) within the Park.**

3. **Develop appropriate boating restrictions in Park waters, in consultation with the Department of Marine and Harbours, to ensure protection of conservation and other values, and safe use of the Park. Protect divers and snorkellers between the Boyinaboat Reef and the southern wall of the boat harbour by prohibiting boats in this area.**

19.5 SURFACE WATER SPORTS

Where conflicts arise between surface water sports (including wind surfing, sailing, water-skiing, paddle boats and surfing) and other recreational activities in the Park, certain uses will take precedence over others. Appropriate guidelines and controls are required to ameliorate potential conflicts.

The case of motorised craft, for specific recreation activities, such as jet skiing and water- skiing, may conflict with other uses of the Park and need to be confined to selected areas. At present, one area has been designated for water skiing. This sport has priority use in this area, however, water-skiing is not permitted elsewhere in the Park. It is possible that there are no suitable areas for some activities in the Park.

Actions

1. **In general, where conflicts arise between surface water sports and uses which are orientated towards passive appreciation of the marine environment, give priority to the latter activities.**

2. **Restrict use of motorised and non-motorised craft to designated areas where necessary, in consultation with the Department of Marine and Harbours.**

19.6 LITTLE ISLAND

Little Island is the only island in the Marine Park, and is a popular attraction. It is a small sandy island (often awash) used as a resting site by sea birds and Sea-lions. Increased visitation has disturbed the resting wildlife and caused conflict between users. The waters surrounding Little Island generally offer safe anchorage and conditions for swimming and snorkelling. Interaction with the Australian Sea-lion in the surrounding waters is common. Little Island and its surrounds is a sanctuary zone due to its high conservation value and popularity with users.

Actions

1. **Allow visitors on Little Island to view Sea-lions for a restricted period of time. Prohibit all other activities including picnicking and sunbathing.**

2. **Monitor use and its impact on wildlife to determine if the level of protection should be increased.**

3. **Implement public awareness programs that promote the need to minimise disturbance to wildlife.**

19.7 MARINE MAMMAL INTERACTION

During various times of the year, the waters of Marmion Marine Park can be host to a variety of marine mammal species. The west coast population of humpback whales can be seen mainly during the winter months as they migrate to and from their summer feeding grounds in Antarctica and breeding areas in the north of Western Australia.

A population of Australian Sea-lions moves in and out of the Park on an 18-month breeding cycle. A number of bottlenose dolphins are believed to have their home range in Park waters. Other seal and dolphin species also visit this area with strandings occurring infrequently.

Marine mammal species generate a great deal of public interest. An organised commercial whalewatching industry has been established and is likely to expand.

Actions

1. **Continue public education programs to encourage responsible viewing of marine mammals by the public.**

2. **Ensure marine mammal interactions conform to CALM guidelines.**

3. **Allow commercial concessions by permit. Limit the issue of permits and establish guidelines.**

4. **Integrate management of commercial whalewatching in the Park with management outside the Park.**

5. **Develop a contingency plan for stranded marine mammals to ensure the welfare of animals is a primary consideration, and the opportunity for research is utilised.**

6. **Maintain ongoing monitoring programs of marine mammal populations and the impacts of visitors on them.**

19.8 COMPETITIVE EVENTS

The Marine Park is the venue for organised competitive events including fishing competitions and sailing regattas. These events range from small club events held on a regular basis to large scale events. They can cause management problems, adversely affect the environment and/or conflict with other users.

Actions

1. **Require organisers of all competitive events to obtain approval from the Marine Park Manager and comply with conditions imposed. Implement a permit system as required.**

2. **Encourage organisers of fishing competitions to conduct competitions by species and not by bag-weight to minimise local impacts on conservation values.**

3. **Charge fees or obtain bonds, if required, in accordance with CALM policy.**

20.0 COMMERCIAL FISHING

Commercial fishing in the Park is regulated and managed by the Fisheries Department in consultation with CALM. It is confined to the area zoned for General Use. Few commercial licences operate within 1800 metres of high water mark where recreational use is high.

Commercial fishing will be confined to those methods which are not environmentally damaging. Any species shown to be over-fished, or at risk of being so, may be protected either throughout the Park or in any part of the Park.

Three commercial fisheries operate in the Park waters. They are rock lobster fishing by pot, abalone fishing by hand and beach seining.

Actions

1. **Do not permit new commercial fisheries in the Park except if careful assessment in conjunction with the Department of Fisheries proves their environmental acceptibility.**

2. **Do not permit new commercial fishing techniques in the Park except if careful assessment proves their environmental acceptibility.**

3. **Ensure monitoring of fish populations is undertaken to ensure sustainable use. Liaise with the Fisheries Department.**

4. **Seek proclaimation of fishing regulations, if necessary, to protect any species of fish shown to be in need of special protection.**

20.1 ROCK LOBSTER FISHERY

The Park occupies 30% of transects 315 and 316 of the western rock lobster (*Panulirus cygnus*) fishery. The Park supplies about 80 000 kg of rock lobster annually, approximately 0.7% of Western Australia's catch. Although up to 30 boats fish the two transects, approximately 10 boats on average work Park waters during peak season.

Actions

1. **Allow commercial rock lobster fishing in the General Use Zone only. Fisheries Department monitor stocks.**

2. **Monitor the impact of commercial rock lobster fishing on conservation and recreation values particularly within 1800 metres of high water mark. Review regulations and zoning if there are indications of impacts on these values.**

20.2 ABALONE FISHERY

Up to 20% of the Western Australian total annual commercial catch of Roe's abalone *(Haliotis roei)* is taken from onshore reefs within the Park. The catch is taken by diving and is restricted to only a few weeks of the year during the "season". On average, only five licences operate in Park waters during this period at any one time (Fisheries Department Submission).

Action

Permit commercial abalone fishing in the General Use Zone as a "seasonal" fishery determined yearly after consultation between CALM and the Fisheries Department.

20.3 BEACH SEINING

Presently, the six beach seining licences permitted to net within Park waters are restricted to specific times. The licences are not transferable and will lapse as each fisherman ceases to work the area.

Mullet, yellow eye mullet and whitebait migratory species, not normally the pursuit of recreational fishers, are target species. Beach seining requires access by four wheel drive vehicles and, therefore, requires approval from local authorities.

Actions

1. **Permit commercial beach seining and netting by approved commercial fishermen for specific species in the Park on the understanding that authority granted to each fisherman is not transferable and will lapse as each fisherman retires or leaves the area.**

2. **Four wheel drive access for beach seining requires approval from local government authorities.**

21.0 COMMERCIAL CONCESSIONS

Commercial concessions may be granted on CALM managed lands and waters to provide appropriate facilities and services for visitors. Proposals are carefully considered by CALM and may require approval by the NPNCA and the Minister for the Environment. Concessions must be consistent with the purpose of the Park and the protection of its values. Facilities or services which exist or can be developed elsewhere in a way which adequately meets visitor needs should not be provided on CALM managed lands and waters.

Lease, licence or permit arrangements can be mutually beneficial to CALM, the commercial operator and the public. Commercial operators may be able to assist CALM with some management tasks and thus 'free up' scarce resources such as ranger time. CALM is likely to undertake those commercial activities which:

- are environmentally or socially sensitive; or
- are of important educative or interpretive value to visitors.

Departmental policies will need to be implemented consistently and impartially, and areas and conditions of operation will need to be clearly defined.

Actions

1. **Glass-bottom reef-viewing tours, charter fishing vessels, dive tours and any other services provided by private commercial operators within the Park will be subject to assessment and permits issued by CALM under standard concession arrangements.**

2. **Commercial operators who hire equipment or other services within the Park will be subject to assessment and permits issued by CALM under standard concession arrangements, after liaison with the Department of Marine and Harbours and local authorities.**

3. **Design the permit conditions to ensure environmental protection and high education and service standards are maintained.**

4. **Stringently assess concession operations in Sanctuary and Recreation Zones.**

21.1 COMMERCIAL FISHING CHARTER

The potential for an increase in charter fishing operations in the Park is high. Regulation of the fledgling industry in the Park is required to:

- protect the resources of the Park, which are the basis of the industry, from overfishing;
- ensure that high standards are maintained and that Park visitors have a quality experience; and
- ensure that the commercial viability of the industry is sustained by regulating the number of concessions.

Charter operations should develop a common code of ethics and standards of service. When a boat is chartered for recreational fishing by amateurs, all fish caught must be in accordance with regulations set down for the Park including, fish must not be sold for commercial gain.

Actions

1. **All fishing charter vessels must operate in accordance with CALM policy on concessions and meet the requirements of the Department of Marine and Harbours and the Fisheries Department.**

2. **Allow charter fishing in the General Use Zone only.**

3. **Subject commercial fishing operators to a permit. Design appropriate conditions.**

22.0 AIRCRAFT

Both military and civil aviation pilots need to be aware of the impact that low flying over the Park has on some wildlife and recreation experiences sought by visitors. Liaison with the Civil Aviation Authority and the Royal Australian Air Force is required to establish appropriate guidelines for operations of aircraft over the coastal portion of the Park. The objective should be to ameliorate disturbance of wildlife and conflict with the Park user, while recognising the operational objectives of the Air Force and operational requirements for civil aviation aircraft.

Action

Liaise with the Civil Aviation Authority and the Royal Australian Air Force to avoid, wherever possible, disturbance of wildlife and Park users.

23.0 MARKETING AND PROMOTION

Historically, the provision of adequate management has lagged behind the marketing and promotion of parks. This anomaly needs to be recognised and the marketing and promotion of the Park by CALM and other agencies be co-ordinated with management resources and facilities in the Park.

Actions

1. **Where possible, encourage marketing and promotion of the Park to a level commensurate with the level of Park management resources and the facilities provided for visitor use.**

2. **Liaise with relevant people/agencies to ensure that marketing and promoting the Marine Park is compatible with the Park's management goals and objectives.**

24.0 FACILITIES AND DEVELOPMENT

24.1 NAVIGATION AND OTHER MARKERS

Currently, offshore and onshore markers guide boat users through reefs to both the Hillarys and Ocean Reef Boat Harbours. The provision of markers and other navigational aids are regulated by the Department of Marine and Harbours.

Buoys mark sailing courses to the south of the Hillarys Boat Harbour and north of Mullaloo Point. Markers also depict the water ski area at Mullaloo Point. Although there are no definite proposals, marking of zones may be required. Wherever possible this should be done in a sensitive manner and on the coast rather than offshore.

Action

Install offshore markers only where there is a demonstrated need and no effective alternative. Fully assess the installation of markers in the Park in liaison with the Department of Marine and Harbours. Aesthetic design and placement are important considerations.

24.2 MOORINGS

Moorings and their floats impinge upon the use of an area and imply right to exclusive use. Location and design of moorings need careful consideration to avoid environmental damage.

Action

The location and installation of any markers and moorings, temporary or permanent, require approval from CALM. Only approved designs will be permitted. Liaise with the Department of Marine and Harbours on these matters.

24.3 JETTIES

Presently a small fishing jetty is located at North Beach for line fishing. The reconstructed jetty, the only one in Park waters, was part of a longer jetty destroyed by storms. Other jetties are not expected to be built because of the facilities available at Hillarys and Ocean Reef Boat Harbours.

Action

Design, location and installation of any jetty requires the approval of both CALM and the Department of Marine and Harbours, and must comply with construction and maintenance standards.

24.4 GROYNES AND BREAKWATERS

Groynes and breakwaters associated with any boat ramp or marina development may have considerable environmental impact. Groynes have been used in stabilisation programs at Sorrento.

Action

Proposals to construct groynes or breakwaters require environmental assessment in accordance with the Environmental Protection Act and approval by CALM.

24.5 STRUCTURES AND PLATFORMS

Proposals to place platforms and structures at quality reef areas are common place in areas of high tourist potential. Within the waters of the Marmion Marine Park, however, small platforms are moored off popular swimming beaches as rest sites for swimmers. Large scale proposals are unlikely during the term of this plan.

Actions

1. **Any proposals involving the placement of structures on or near reefs shall include an engineering and operational outline of the facility and be subject to detailed environmental assessment in accordance with the Environmental Protection Act.**

2. **Proposals for structures and platforms requires CALM's approval in addition to any assessment for licences under the Jetties Act.**

3. **Structures and platforms will not be permitted in Sanctuary Zones.**

24.6 OVERSEAS TELECOMMUNICATIONS COMMISSION (OTC) CABLE

In June 1985, an armoured submarine OTC cable was laid in a series of curves around the high reefs to make landfall at Whitford Beach.

Action

No anchoring will be permitted within 500m of the OTC cable path, as notified by the Department of Marine and Harbours.

24.7 MARINAS

Marina facilities exist adjacent to, but outside, the Park at Hillarys Boat Harbour and the Ocean Reef launching facility. The Hillarys Boat Harbour provides facilities for concession operations and services to Park visitors. Developments planned for the Ocean Reef facility would change its existing status. Marinas require consideration of equity to all Park users, the environmental impact on natural resources and the effect of increasing subsidiary management costs of the Park.

All proposed marina developments are subject to environmental impact assessment in accordance with the Environmental Protection Act. The Environmental Protection Authority liaises with CALM.

Action

Discourage construction of marinas in the Park.

24.8 BOAT RAMPS

Boat launching facilities at Hillarys Boat Harbour and Ocean Reef cater for up to 700 trailer craft per day. Small craft also launch from the beach at Mullaloo Point, a small shallow water ramp at Trigg Island and a private ramp at the Marmion Angling and Aquatic Club. The projected increase in population in the North West Corridor is likely to increase boat ownership by up to 200% during the term of this plan.

Action

Proposed sites, development and construction methods for boat ramps, other than those identified, must have prior approval from CALM.

24.9 DRAINAGE AND DISCHARGE

Stormwater drains enter Park waters at only a few locations bordering the City of Stirling and the City of Wanneroo. Secondary treated effluent from the Beenyup Waste Water Treatment Plant is pumped 1.6km offshore. This is to be duplicated. The EPA gave qualified approval, subject to conditions ensuring that the combined nutrient loading from both pipelines does not exceed the maximum load set for the original single outfall (EPA, 1990). The EPA also required the Water Authority of W.A. to conduct studies of water circulation, nutrient levels, and other matters relating to the potential impacts of the Beenyup outfalls. Drainage and discharge into the Hillarys Boat Harbour is regularly monitored and must meet standards established by the EPA.

Actions

1. **Maintain liaison with the Water Authority, EPA, and the City of Wanneroo to ensure adequate conditions are set to minimise the detrimental environmental effects of outfalls.**

2. **Ensure the EPA recommendations that limit nutrient levels and require appropriate research and monitoring programs are implemented.**

24.10 LITTER

Litter is common and obvious at most times on beaches in the Marine Park. Both recreational users and commercial fishers contribute to the litter problem, which detracts from the Park environment, aesthetically and biologically. Some types of litter, for example plastic binders of 'six-packs', can kill wildlife, particularly sea birds.

Actions

1. **Develop education programs to encourage the proper disposal of litter. Liaise with local authorities and other relevant agencies regarding the provision of disposal facilities onshore.**

2. Develop education programs to encourage commercial fishers to bring all disposable items ashore, including items which biodegrade slowly, for appropriate disposal.

INFORMATION, INTERPRETATION AND EDUCATION

25. Information, Interpretation and Education

25.0 INFORMATION, INTERPRETATION AND EDUCATION

INFORMATION, INTERPRETATION AND EDUCATION GOAL

Create an awareness, understanding and appreciation of the marine and coastal environments and the limitations on their use.

Meeting the public's expectations of the Park, and increasing public awareness and appreciation of natural values of the marine environment will be a major challenge. The proximity of the Park to Perth ensures regular and high numbers of users. In addition, its well-established volunteer support group and the range of interpretive opportunities available, make the Park suitable as the Marine Interpretive Focal Unit for both the metropolitan area and the State. Education and interpretation programs will be important. Educational material and guided interpretation of the reef are in demand. Different aspects of the Park will be addressed via:

- on-site interpretation, including underwater trails, on-site signs and displays, printed material, guided activities, talks and tours;
- off-site interpretation, including a variety of general marine booklets, interactive displays outside the Park (for example, shopping centres), and the promotion of the Park in local and metropolitan media; and
- support programs in which volunteers will be recruited and trained to develop Park projects.

The 'Friends of Marmion Marine Park' and the Park Guides are acknowledged as having a significant and positive contribution to the provision and dissemination of information about the Park and its values (see 3 1.0 Community Liaison).

Actions

1. **Develop an interpretation and communication program for the Park.**

2. **Establish a formal volunteer program and involve local community members in day-to-day management of the Park.**

3. **Recognise the role of the 'Friends of the Marmion Marine Park' with appropriate liaison and support.**

4. **Ensure commercial operators maintain appropriate standards with respect to information and quality of service provided. Target concessionaires as a high priority for information and education.**

5. **Develop underwater trails that complement the Boyinaboat Trail and cater for a range of skills.**

6. **Provide information on the marine environment and, where possible, conduct guided nature swims and walks, and other tours by appropriately trained staff and volunteers.**

7. **Continue to provide the public with printed and electronic interpretative material that deals with aspects of the marine and coastal natural history of the Park.**

8. **Regularly review and update interpretive signs and displays, including panel and interactive material. Consider their location onshore in liaison with the appropriate land manager.**

9. **Promote educational tours by school and other groups. Organise special 'Holiday Activities Programs' at least annually to coincide with school holidays or special functions.**

10. **Ensure that adequate information is provided for boat users on safety requirements, conditions at sea and boating ethics.**

11. **Provide signs in accordance with CALM's sign manual. Consider the need to distinguish Park signs for the proliferation of other signs, particularly along the coastal strip. Liaise with nearby land managers regarding CALM signs onshore.**

12. **Develop interactive displays to be used at special functions outside the Park.**

13. **Continue to be proactive in the provision of news items to local and metropolitan media (refer also to Section 23.0, Marketing and Promotion).**

RESEARCH AND MONITORING

26. Research and Monitoring

26.0 RESEARCH AND MONITORING

RESEARCH AND MONITORING GOAL

Seek a better understanding of the natural and cultural environment and the impacts of visitor use and management activities.

The implementation of research and monitoring programs is pivotal to improving our understanding of the interactions between oceanographic and biological processes occurring in the Park. The impacts that recreational and commercial uses have on natural resources and on each other, and their potential for expansion without conflict, are fundamental issues in management of the Park and economic development of the region. Research will be programmed and ongoing, and designed to fill gaps in knowledge.

Priority will be given to management-orientated research and monitoring programs. Research which involves unwarranted manipulation or destruction of natural resources will not be permitted.

Actions

1. **Continue research into the interactions between ecological and oceanographic processes of the Park. Sanction all research programs by permit.**

2. **Ensure fish populations are monitored to ensure a sustainable fishery. Liaise with the Fisheries Department.**

3. **Monitor and periodically conduct special surveys of recreational and commercial use, and the impacts of this use, in and adjacent to the Marine Park.**

4. **Implement monitoring programs to determine the maintenance or replenishment of habitat and species diversity in Sanctuary Zones as compared to Recreation and General Use Zones.**

5. **Support research projects carried out within the Park by other agencies to the level of available resources.**

IMPLEMENTATION

27. Safety, Search and Rescue
28. Staffing, Surveillance and Enforcement
29. Marine Pollution
30. Funding
31. Community Liaison
32. Review

27.0 SAFETY, SEARCH AND RESCUE

A number of boating accidents have occurred in the Park, some resulting in fatalities. Drownings have also occurred on coastal reefs. Most accidents appear to have been due to a combination of factors including inadequate knowledge of local conditions, inappropriate boats and safety equipment for the prevailing seas and overloading. Inexperience or incompetence are often significant contributing factors in accidents.

Actions

1. **Assist with the provision of information and guidance to Park users on all aspects of safety at sea.**

2. **Through involvement with rescue authorities, train management staff in skills to assist Park users and promote safety.**

28.0 STAFFING, SURVEILLANCE AND ENFORCEMENT

The Park is managed by Rangers from CALM's Swan Region based at Hillarys Boat Harbour. Other CALM staff from the Regional Office and Departmental branches (for example, Wildlife, Protection and Research) provide support and assistance with works programs. Future staffing levels will be continually assessed and will be subject to available resources. CALM officers work in close liaison with officers from the Fisheries Department, Department of Marine and Harbours and local government to ensure an integrated approach to day-to-day management of the Marine Park.

Surveillance is important because it provides information on patterns of use (which affect allocation of resources), detects breaches of regulations, and aids in detection and prevention of accidents. Surveillance and enforcement are particularly important in the initial years of management as they provide an opportunity to familiarise users with the rules and in some cases, to convince people that their previous activities are no longer appropriate. Surveillance and enforcement also supports the behaviour of those Park users who abide by rules by protecting their right to equitable use of resources.

Users of the Park will generally both respect and support the management effort towards enforcement thereby enabling a code of ethics to evolve in which the community of users will be the

effective managers of the Park. This will enable staff to concentrate more fully on their primary role of assisting and guiding users and will lessen overall costs of Park management.

Actions

1. **Subject to Departmental priorities and funding, provide adequate numbers of staff to enable implementation of the Marmion Marine Park management plan and to ensure ongoing protection and maintenance of the Park.**

2. **Develop working guidelines to establish the framework for regular interagency liaison by field officers.**

3. **Ensure field staff provide information, record use, detect infringements and monitor ecosystems as their priority role.**

4. **Continue to train CALM officers to conduct their duties professionally and develop a good working relationship with the public.**

29.0 MARINE POLLUTION

Appropriate guidelines need to be provided and regulations implemented in order to minimise pollution of marine waters by fuel or chemicals. The discharge of wastes, including plastics, into the Park from adjacent land or waters also requires appropriate regulation. Marine pollution events and their clean-up are co-ordinated through a State Combat Committee, chaired by the Department of Marine and Harbours. CALM is a technical advisory representative to this committee. In the Marmion Marine Park, CALM will advise the combat committee of conservation and recreation values and procedures for the prevention and clean-up of spills within the Park.

Actions

1. **Ensure charter and other boat users in the Park and adjacent harbours adopt appropriate procedures for re-fuelling and cleaning of boats.**

2. **Formulate guidelines to minimise the threat, and a contingency plan to clean up, spills of polluting substances. Ensure, through co-ordination by CALM, that this is undertaken with careful regard for conservation and other Marine Park values.**

30.0 FUNDING

This management plan will be implemented by CALM within the framework of available resources. Many of the strategies in the plan are ongoing. To be proactive in management, more funding is required.

Actions

1. **Actively seek an adequate budget allocation to implement strategies.**

2. **Actively seek funding both within and outside Government to implement the management plan.**

31.0 COMMUNITY LIAISON

Ongoing liaison with local community groups and associations is essential, as is liaison with interests further afield. This is mostly achieved by day-to-day contact between CALM staff and members of the public, including direct contact when on patrol or giving talks, and indirect contact through brochures, signs and other media.

CALM has established a program for the involvement of volunteers on CALM estate. A 'Friends of Marmion Marine Park' group has been formed and plays a vital role in community liaison. It promotes an awareness, understanding and appreciation of the Marine Park. The public may also become involved in the implementation of this plan.

Actions

1. **Hold regular meetings to discuss aspects of management of the Marine Park with the local community and other interest groups.**

2. **Encourage community involvement in the implementation of this management plan.**

3. **Continue to nurture and support the 'Friends of Marmion Marine Park' volunteer group.**

32.0 REVIEW

The term of this plan will be 10 years.

Actions

1. **Review the implementation of the plan annually, before preparing works programs for the following year. The review should identify which prescriptions have been achieved and to what degree, and any new information which may affect management.**

2. **Review the zoning scheme early in the life of the plan.**

3. **Review the plan within 10 years from the date of Ministerial approval of the plan. This review should identify the extent to which the objectives have been achieved and strategies implemented, the reasons for lack of achievement or implementation, and a summary of information which may affect future management, in addition to proposing changes and new strategies where appropriate.**

There is provision under Section 61 of the CALM Act 1984 for the plan to be amended, as required. If there are major changes to the plan, the revised plan will be released for public comment. The review of the zoning scheme early in the life of the plan will be subject to this amendment process.

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APPENDIX 1.

Fish permitted to be taken in the General Use Zone of the Marmion Marine Park by methods promulgated from time to time under the Fisheries Act.

a) Any species of fish of the classes Osteichthyes (bony fishes) and Chondrichthyes (cartilaginous fishes).

b) Any species of fish of the class Cephalopoda commonly known as cuttlefish, squid and octopus.

c) The species of the class Crustacea known as *Panulirus cygnus* (western rock lobster) and *Portunus pelagicus* (blue swimmer crab).

d) The species of the class Mollusca known as *Haliolis roei* (Roes abalone).

All other marine life is gazetted as protected flora and fauna under the Wildlife Conservation Act.

APPENDIX 2

Western Australian
FISHERIES ACT 1905
MARMION MARINE PARK OCEAN REEF AND HILLARYS BOAT HARBOURS
FISHING RESTRICTIONS
Notice No. 376

516/85

MADE by the Minister pursuant to sections 9, 10 and I I of the Act.

Citations

1. This Notice may be cited as the *Marmion Marine Park Ocean Reef and Hillarys Boat Harbour Fishing Restrictions Notice 1989.*

Prohibition on taking fish

2. All persons are prohibited from taking any fish whatsoever in the waters described in the Schedule except as hereinafter provided.

Licensed professional fishermen

3. The holder of a professional fisherman's licence shall not take any species of fish for sale in the water described in the Schedule except that -
   (i) rock lobster may be taken by means of rock lobster pots used from a boat authorised to operate in the West Coast Rock Lobster Limited Entry Fishery.
   (ii) Roe's abalone may be taken by a person authorised to take abalone within Zone 3 of the Abalone Limited Entry Fishery; and
   (iii) other fish may be taken with the use of a hauling net by a person authorised in writing by the Director in the waters of the Marmion Marine Park provided such net is not used within the Ocean Reef and Hillarys Boat Harbours and within 200 metres seaward of the groynes and entrances of those harbours.

Use of nets to take crabs

4. Any person may use a hand held scoop net or drop net to take crabs.

Use of spearguns etc

5. Any person may use a speargun, harpoon, hawaiian sling and all other similar pointed instruments to take -
   (i) any species of fish of the classes Osteichthyes (boney fishes) and Chondrichthyes (cartilaginous fishes); and
   (ii) any species of fish of the class Cephalopoda commonly known as cuttlefish, squid and octopus; provided that a speargun, harpoon, hawaiian sling and all other similar pointed instruments are not used to take any fish whatsoever in any waters within 1800 metres of the high water mark of the west coast of Australia.

Use of other means of capture

6. Any person -
   (1) being the holder of a recreational fishing licence authorising the taking of rock lobster, may take the species of fish of the class Crustacea known as *Panulirus cygnus* (western rock lobster)
      (a) by hand; or
      (b) by means of rock lobster pots;
   (2) may take the species of fish of the class Crustacea. known as *Haliotis roei* (Roe's abalone), provided that the taking is permitted in accordance with Fisheries Notice No. 375 (Metropolitan Recreational Abalone Fishery);

(3) may take the species of fish of the class Cephalopoda commonly known as octopus by means of octopus traps;

For the purpose of this Notice an octopus trap is a device constructed of one or more pieces of tubing, having a diameter not exceeding 200 millimetres, is not baited and is used only for the purpose of taking or attempting to take octopus.

(4) may take -

(a) any species of fish of the classes Osteichthyes (boney fish) and Chondrichthyes (cartilaginous fishes); and

(b) any species of fish of the class Cephalopoda commonly known as cuttlefish, squid and octopus, by means of -

(i) a hand line; or

(ii) a rod, reel and line, with no more than three hooks attached.

Exceptions

7. Where an exception to the prohibition contained in clause 2 is granted, any such exception does not extend to or in any way amend the requirements or restrictions imposed pursuant to the Fisheries Act 1905 on the taking of any fish referred to in this Notice.

Cancellations

8. Notices Nos. 280, 281, and 283 published in the *Government Gazette* of 11 December 1987, are cancelled.

Schedule (Clause 2)

(a) All that portion of the Indian Ocean lying within the boundaries of the Marmion Marine Park Reserve No I bordered in red on Department of Land Administration Miscellaneous Plan numbered 1597, but not including those waters within the Marmion Marine Park described in Fisheries Notice No. 329; and

(b) All waters within the Ocean Reef Boat Harbour and the Hillarys Boat Harbour.

Dated this 3 1 st day of January 1989

JULIAN GRILL
Minister for Fisheries

[Extract from Government Gazette No 394, 10 February 19891

APPENDIX 3(a)

WILDLIFE CONSERVATION ACT 1950

(Section 14)

Notice

Fauna of the Marmion Marine Park

CALM 007143F2013.

PURSUANT to the powers conferred by section 14 of the Wildlife Conservation Act 1950, 1 hereby declare as follows -

1. That there. shall be an open season in respect of those species of fauna described in the First Schedule hereunder in the whole of that part of the State which lies within the boundaries of Marmion Marine Park as described in the Second Schedule hereunder.
2. A person may take fauna of the species described in the First Schedule hereunder without a licence issued under the Wildlife Conservation Act 1950 provided that any fauna so taken is taken in accordance with the Fisheries Act 1905.
3. For the purposes of paragraph 2 of this Notice, fauna of the species described in the First Schedule hereunder shall be fauna that are fish within the meaning of the term fish as it is defined in the Fisheries Act 1905.
4. A person shall not take any fauna within the area defined in the Second Schedule hereunder, other than fauna of the species described in the First Schedule hereunder, unless that fauna is taken in accordance with the Wildlife Conservation Act 1950.

BARRY HODGE
Minister for Conservation and Land Management

2

First Schedule

1. Any species of the class Osteichthyes (boney fish).
2. Any species of the class Chondrichthyes (cartilaginous fish).
3. Any species of the class Cephalopoda (cuttle fish, squid and octopus).
4. The species of the class Crustacea known as Panulirus cygnus (western rock lobster), Ovalipes australiensis (white-spotted sand crab) and Portunus pelagicus (blue swimmer crab).
5. The species of the class Mollusca known as Haliotis roei (Roe's abalone).

Second Schedule

All that land and waters comprising Marmion Marine Park -

1. Marine Park Reserve No 1. (All that area delineated and shown bordered red on Land Administration Miscellaneous Plan 1597. Public Plans Swan 1:2 000 05.01 to 05.05 inclusive and Perth 1:2 000 06.37 and 07.33 to 07.37 inclusive).
2. Reserve No. 39782 (Marine Park) Swan Location No. 10854. (Reserve/Diagram 605, Little Island. Public Plan Swan 1: 10 000 1.2)
3. Reserve No. 39783 (Marine Park) Swan Location No. 10855. (Reserve/Diagram 606, Bums Rocks. Public Plan Swan 1: 10 000 1.2).

[Extract from Government Gazette No 116, 11 December 1989]

APPENDIX 3(b)

WILDLIFE CONSERVATION ACT 1950

(Section 14)

Notice

Invertebrate Fauna

CALM 019316F3805 and 007143F2013.

PURSUANT to the powers conferred by section 14 of the Wildlife Conservation Act 1950, 1 hereby declare as follows -

1. That the provisions and operations of the notice published in Government Gazette (No. 56) of 11 August 1978 are hereby cancelled.
2. That all invertebrate fauna, other than invertebrate fauna of the species described in the First Schedule hereunder and in the Second Schedule hereunder, shall not be protected fauna throughout the whole of the State.
3. A person shall not take any invertebrate fauna of the species described in the First Schedule hereunder unless that fauna is taken in accordance with the Wildlife Conservation Act 1950. 1
4. A person shall not take any invertebrate fauna of the species described in the Second Schedule hereunder unless that fauna if taken in accordance with -
   (a) the Wildlife Conservation Act 1950;
   (b) the Fisheries Act 1905; and
   (c) any classification of the whole or any part of any marine nature reserve, marine Park or other marine reserve, where such a classification has been made pursuant to Section 62 of the Conservation and Land Management Act 1984 to provide for the objects and purposes of Section 13 of that Act.

BARRY HODGE
Minister for Conservation and Land Management

First Schedule

Jewel beetles of the family *Buprestidde.*

Ants of the genus known as *Nothomyrmecia.*

Second Schedule

Invertebrate fauna within any marine nature reserve, marine park or their marine reserve where the terms marine nature reserve, marine Park and marine reserve have the description and meaning ascribed to those terms in and for the purposes of the Conservation and Land Management Act 1984.

[Extract from Government Gazette No 116, 11 December 1987