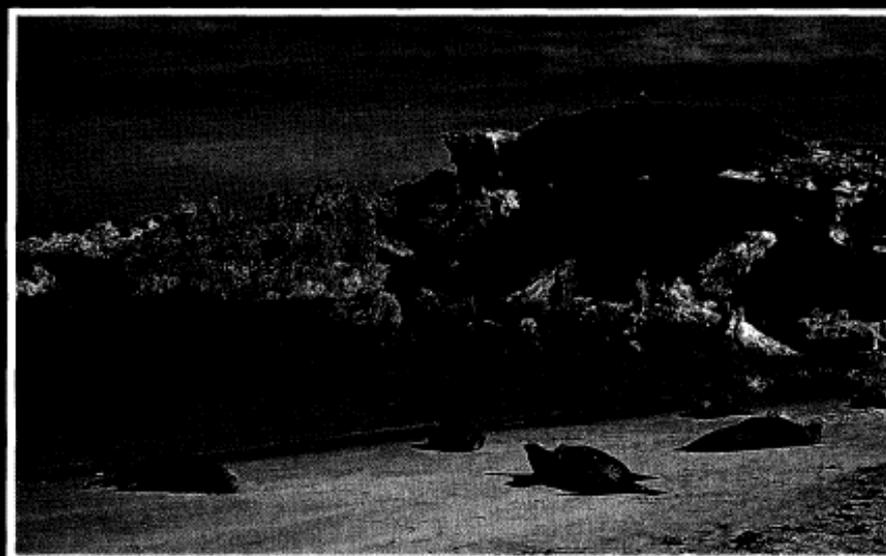


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Shoalwater Islands

Management Plan

1992-2002



MANAGEMENT PLAN No 21



Department of Conservation
and Land Management



National Parks and Nature
Conservation Authority

Shoalwater Islands

Management Plan

1992-2002

Planning Team

Kate Orr (Co-ordinator)

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Department of Conservation and Land Management
for the
National Parks and Nature Conservation Authority

PREFACE

Conservation reserves in Western Australia, such as national parks, nature reserves and other reserves, are vested in the National Parks and Nature Conservation Authority (NPNCA), and managed by the Department of Conservation and Land Management (CALM).

The NPNCA is responsible for the preparation of management plans for all land and water which is vested in it, and these plans are prepared by CALM on their behalf. A draft management plan for the Shoalwater Islands was released for public comment. After consideration of public comment, the NPNCA submitted the revised plan to the Minister for the Environment for approval.

A change of purpose for Penguin Island to "Conservation Park" will have to be approved by Parliament before actions regarding zoning are able to proceed. The plan also proposes the reserving of other Islands which are currently vacant Crown land, and this must occur before actions relating to these Islands are able to proceed.

At a later date the Shoalwater Islands Management Plan will be complemented by a management plan for the Shoalwater Islands Marine Park. As the land and water environments are closely interrelated, references have been made to the marine component within this plan.

The Minister for the Environment approved this document as the management plan for the Shoalwater Islands on July 13 1992.

On May 11 1992, the Bush Fires Board endorsed this plan under Section 34(1) of the Bush Fires Act (1954).

ACKNOWLEDGEMENTS

The planning team was assisted by Rae Burrows (Section 22 Information/Interpretation and Education), Jim Stoddart, Greg Keighery and Luisa de Braganca (Section 24 Research and Monitoring), Stuart Scobie and Richard Hammond (Section 19 Penguin Island), Richard Grant (editing), Anthony Sutton, Alan Clarke, Allana Stingernore, Lyndon Mutter, Gordon Graham, Jim Maher, Richard May, members of Planning Branch and the Swan Region and other CALM staff.

Nick Dunlop (consultant) made a major contribution to sections concerning conservation management and his efforts are acknowledged. The work of researchers from Murdoch University and other institutions is also acknowledged.

The advice provided by the Shoalwater Islands Advisory Committee is acknowledged. The members - Dr Nick Dunlop (past member), John Ham, Drew Haswell (past member), Captain Frank Hughes, Judy Jenkins, Dr Roger Lethbridge, Amy Paul, Greg Pobar (Chairman), Commander W G (Bill) Ritchie, Richard Smith (past member), and Ross Smith (past member) - have willingly given their time, enthusiasm and knowledge. Many other interested people and groups have also contributed.

The efforts of CALM's Land Information Branch in preparing the maps and Debbie Bowra for the typing are appreciated.

Photographs for the cover were provided by Allan Padgett (Planning Branch, CALM) on the front and Terry Goodlich (Ranger, CALM) on the back.

SUMMARY

VALUES OF THE SHOALWATER ISLANDS

The Shoalwater Islands are a chain of islands between Cape Peron and Becher Point that run parallel to the coast near Rockingham, about 50 km from Perth. The chain comprises Penguin Island, Shag Rock, Seal Island, Gull Island, Bird Island, White Rock, The Sisters, Passage Rock, Third Rocks, First Rock and Second Rock. It covers an area of about 16ha.

The Islands have significant conservation value. About 50 species of birds use the Islands, some for nesting, feeding and roosting. They include migratory species that are covered by international treaties. Penguin Island supports the largest breeding population of Little Penguins on the west coast of Australia.

The Australian Sea-lion, a species gazetted as in need of special protection, uses Seal Island and occasionally other Islands as resting sites.

Penguin Island, the largest Island in the chain, covers 12.5ha and is a popular visitor destination, providing a range of recreation and interpretation/education activities. It attracts many tourists, including people from interstate and overseas. Researchers study the Island's wildlife.

The diverse natural resources on the Shoalwater Islands have conservation, recreation and education values that are enhanced given their proximity to the metropolitan area. Along with the Shoalwater Islands Marine Park, the islands and their surrounding waters, which are important feeding areas for birds and Sea-lions, have long been recognised as having high environmental significance and recreational potential.

MANAGEMENT GOALS

Conservation

Conserve the biological, physical, cultural and landscape values.

Recreation

Facilitate recreation in a manner compatible with conservation and other values.

Information- Education

Promote informed appreciation of natural and cultural values.

Research-Monitoring

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

KEY ISSUES

- Protection of the wildlife, especially the Australian Sea-lion and Little Penguin and other sea birds.
- Promotion of visitor awareness, appreciation and understanding of the Islands' natural resources and recreation opportunities.
- Control of pests, weeds and fire. Rehabilitation of degraded areas.
- Encouragement and facilitation of the safe access of visitors to Penguin Island, and promotion of an awareness of the potential dangers of crossing the sandbar to the Island.
- Development of the Islands' tourist potential ensuring that the conservation values that attract the tourists are protected.
- Change of the gazetted purpose of Penguin Island to Conservation Park, subject to Parliamentary approval.
- Protection of the reefs, intertidal platforms and other marine communities that surround the Islands and which are an integral part of their attraction.

MANAGEMENT DIRECTIONS

Currently the Shoalwater Islands consist of four reserves and vacant Crown land. The status of the Islands will be changed to reflect their use and to protect their values. Management zones will be provided to protect nesting bird habitats and beaches for Australian Sea-lions, meet the needs of visitors, and minimise the impact of visitor activities.

The zones are:

Special Conservation Zones

Rare, restricted and sensitive species and features that require careful management and protection are found in this zone. Access will be restricted to guided tours or by permit for research.

Recreation Zones

This zone caters for the day use of Penguin Island by visitors. Although set aside for recreation, the zone has conservation values that need protecting - for example, Penguin nests and Little Shearwater burrows. Basic facilities will be provided. Penguin Island will be the focal point for public information, interpretation and education.

CONSERVATION STRATEGIES

Fauna

Shoalwater Islands support a significant number of sea birds. Fourteen of the 48 species recorded in the area nest on the Islands, including the Little Penguin, Little Shearwater, five species of Tern, White-faced Storm Petrel and Pied and Little Cormorants. Some species, including the Caspian Tern, Bridled Tern, Ruddy Turnstone, Whimbrel and Bar-tailed Godwit, are covered by migratory bird agreements with Japan and China. The plan encourages appropriate research on these species and their nesting, feeding and breeding habitats, and prohibits public access to specific areas.

Up to 500 pairs of Little Penguins have been known to breed on Penguin Island. This isolated and distinct population may represent a sub-species. Whereas the past management of Penguin Island was more concerned with catering for visitors than conservation, this management plan minimises the number of buildings on the Island to enhance the availability of nesting sites, and closes the Island to the public during the peak Penguin breeding season.

Seal Island is closed to the public to protect the Australian Sea-lions, a species gazetted as in need of special protection. The beach area on Seal Island cannot support both the Sealions and the large number of people who visit the Island. People can observe the Sea-lions from boats and guided tours to Seal Island will be considered.

Flora

The vegetation communities identified on the Shoalwater Islands are subject to disturbance, from natural sources and from humans, which can lead to erosion and the loss of nesting habitats.

Degraded areas will be rehabilitated, especially the tombolo area of Penguin Island, and visitor access will be provided by walktrails, boardwalks and beaches.

Weeds and Planted Species

Weeds that have been introduced will continue to infiltrate the Shoalwater Islands, and may grow to the detriment of native species. Exotic species, including fig trees, also have been planted on Penguin Island. Weeds will be controlled and the planted species that are detrimental to the conservation values will be removed with priority given to those most detrimental to indigenous species. These sites will be rehabilitated.

Pests

Current estimates show that up to 4 000 pairs of Silver Gulls nest on Shoalwater Islands, including 3 000 pairs on Penguin Island. Before 1940 the figure was 200 pairs. The availability of food from landfill sites on the mainland is believed to be responsible for the population increase.

The number of pigeons on the Islands is also increasing. Pigeons are not a native species and compete with sea birds, including the migratory Bridled Tern, for breeding habitat. The increase in their numbers is related to the availability of grain from Kwinana.

Methods will be instigated to control both the Silver Gull and pigeon populations. To this end CALM will continue to liaise with the City of Rockingham, CBH and other relevant agencies to limit the availability of food.

RECREATION STRATEGIES

The Shoalwater Islands provide a range of water and land-based activities. Visitors are attracted by natural features such as the Islands' wildlife, landscape, and protected beaches and waters, and the diversity of plants and animals on the intertidal platforms, reefs and in the seagrass beds.

Up to 70 000 people visit Penguin Island annually, with about 3 500 people on the Island on the busiest days. Overcrowding does occur. This may affect the quality of the visitors' experience and have a detrimental effect on the ecosystem.

This management plan promotes recreational experiences on Penguin Island that are based on an appreciation of the natural resources, that enhance the visitors' enjoyment, that are of a passive nature, and that differ from activities available elsewhere in the region. Other Islands in the chain will be closed to the public.

INFORMATION / INTERPRETATION AND EDUCATION STRATEGIES

The major use of Penguin Island in the past has been for active recreation. The proposed change in emphasis for the Island is towards passive activities.

With the close proximity of the islands to the metropolitan area, the recreational use will be supported by information, interpretation and education programs that promote an awareness and appreciation of the Shoalwater Islands' values and an understanding of the natural environment.

RESEARCH AND MONITORING STRATEGIES

The Shoalwater Islands have been of interest to researchers who have studied the 'area's flora and fauna for many years. However, the impact of recreational use of the Islands is not known.

Further research will be required in order to develop an understanding of the ecology of the Islands' flora and fauna that will enable the effects of visitor activities and management actions to be assessed. The monitoring of changes to the Islands' biota and physical environments may enable managers to counter any adverse effects.

General Note

This plan has been prepared for the Shoalwater Islands (not the surrounding waters). At a later date it will be complemented by a management plan for the recently gazetted Shoalwater Islands Marine Park. The Islands and Marine Park will be managed as an integrated unit.

Throughout this plan, the tombolo area on Penguin Island refers to the low lying, vegetated area east of the dunes (refer to Figure 1). Its true geomorphological definition is a bar of sand linking an Island to the mainland.

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INDEX TO ABBREVIATIONS

AGC	Australian Groundwater Consultants
CALM	The Department of Conservation and Land Management
CBH	Co-Operative Bulk Handling
EPA	The Environmental Protection Authority
NPNCA	National Parks and Nature Conservation Authority
SPC	State Planning Commission
VISTAT	Visitor Information Statistics
WATC	The Western Australian Tourism Commission

INTRODUCTION

1. Overview
2. Index to actions

1. OVERVIEW

The Shoalwater Islands occur near Rockingham about 50 km from Perth. They are a chain of Islands between Cape Peron and Becher Point that run parallel to the coast and comprise Penguin Island, Shag Rock, Seal Island, Gull Rock, Bird Island, White Rock, The Sisters, Passage Rock, Third Rock, First Rock and Second Rock (figure 1). The Department of Conservation and Land Management (CALM) manages most of these the Islands/rocks on behalf of the National Parks and Nature Conservation Authority (NPNCA). The others are vacant Crown land.

The Islands are important for a diversity of wildlife, particularly the Little Penguin, other sea birds and the Australian Sea-lion. Penguin Island, the largest in the chain and accessible by sandbar, is the most popular visitor destination. The natural environment of the Islands is fragile and has a limited capacity to sustain use without unacceptable environmental change. Increasing pressures as a result of present levels of use and management have affected the Islands' environmental values and decreased the quality of the recreational experience for some visitors.

With the expected increase in the population of Perth and Rockingham¹ and the promotion of Rockingham for marine recreation, the use of the Shoalwater area will increase accordingly. Interstate and overseas visitors are also attracted to this area.

The Islands' make a significant contribution to the conservation value of Western Australia's Islands estate. Their values include:

- A long-term resting site on Seal Island for the Australian Sea-lion. This is one of the two most important Islands in the metropolitan area used by this species. The other is Carnac Island.
- Important sea bird breeding and roosting areas.
- The largest breeding population of Little Penguins on the west coast and probably in Western Australia. This colony and the smaller colony on Carnac Island (to the north) are at the northern limit of the species' range.
- Panoramic coastal views.
- Recreational opportunities on the Islands (and in the surrounding waters).
- Natural resources that are a major tourist attraction.
- A diversity of natural resources that have interpretive and educational potential, particularly given their proximity to the metropolitan area.
- Caves utilised by an early lessee, Seaforth McKenzie, have historical value.
- Opportunities for scientific study, especially of the wildlife.

1. The population of Rockingham as at June 1989 (Australian Bureau of Statistics) is 40,732. This is expected to increase to 150,000 in about 50 years (SPC, 1987).

Management concerns include:

- Disturbance of the Australian Sea-lion.
- Disturbance of Penguin and other bird colonies. Birds occupy all habitat types. The most suitable habitat for some species may also be the most heavily visited.
- Erosion of Island vegetation by strong winds, tides and other environmental conditions and by human activities.
- Increasing numbers of Silver Gulls and pigeons. Their increase is related to the availability of food from mainland rubbish tips (Silver Gulls) and grain bins (pigeons).
- Traditional uses that are inappropriate or need to be restricted due to their impact on the environment. Often they are catered for on the mainland.
- Conflict between visitors because of the limited space for recreational activities.
- The possible dangers when crossing to Penguin Island across the sandbar. Lives have been lost in the past.
- Ensuring that the development of the Islands' tourist potential is consistent and compatible with the protection of conservation values.
- Maintaining the conservation values of the reefs, intertidal platforms and seagrass beds that surround the Islands and which are integral to their attraction.

This management plan has been prepared by CALM to resolve present conflicts, to plan for future needs, and to ensure the values of the Shoalwater Islands are protected and maintained. The plan supersedes a draft management plan prepared in 1984 for the National Parks Authority (now CALM) and the Department of Conservation and Environment (now Environmental Protection Authority). The major principles of that plan have been incorporated in this document. Many of its recommendations have been implemented, such as purchasing the lease on Penguin Island.

2. INDEX TO ACTIONS

References are shown as the page number followed (in brackets) by the number of the action from the top of the page. Bold type denotes a principal reference.

SUBJECT REFERENCE(S)

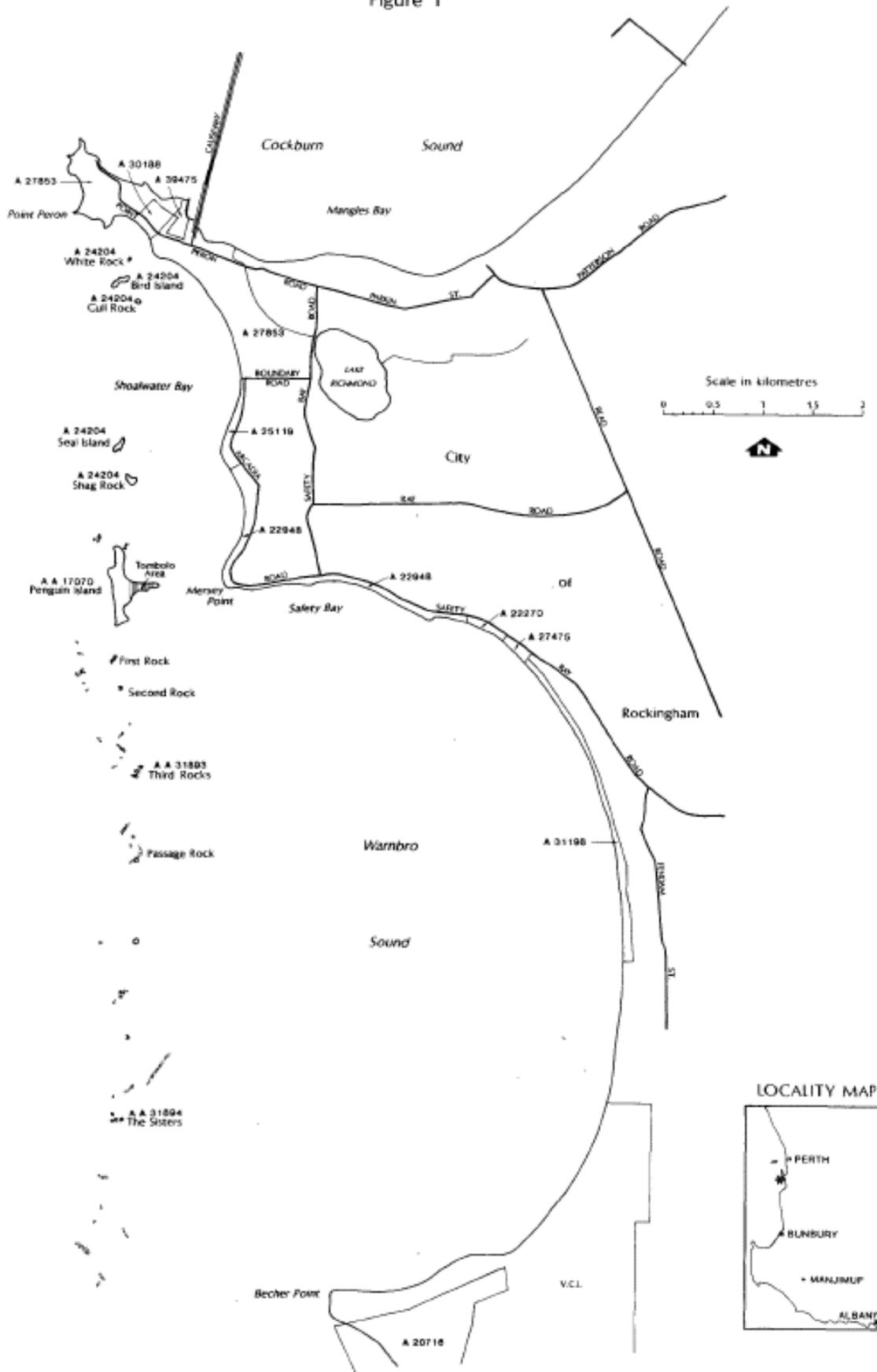
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LOCALITY AND TENURE

Figure 1



PRINCIPAL MANAGEMENT DIRECTIONS

3. Purpose and Tenure
4. Policies and Goals
5. Interaction with Surrounding Waters and Adjacent Land
6. Zoning

3. PURPOSE AND TENURE

The objective is to ensure that the gazetted purposes for the Shoalwater Islands adequately protects their values.

The Shoalwater Islands consist of four reserves and vacant Crown land. The reserves are vested in the NPNCA, and are managed by CALM.

- Penguin Island, the largest of the Islands, is an A Class reserve (17070) covering 12.5ha. It is reserved for the purpose of 'Recreation, Camping, Enjoyment by Public for Holiday Thereon and for Purposes Ancillary Thereto'. The reserve extends to high-water mark. It excludes Reserve 11954, which covers 0.45ha and is reserved for the purpose of 'Trig Station'.
- Shoalwater Bay Islands Nature Reserve, comprising Bird Island, White Rock, Gull Rock, Shag Rock, and Seal Island, is an A Class reserve (24204) for 'Conservation of Flora and Fauna'. It is 3.2ha in area. The reserve extends to low water mark.
- Third Rocks Nature Reserve is an A Class reserve (31893) for 'Conservation of Flora and Fauna' and is 0.29ha in area. The reserve extends to low water mark.
- The Sisters Nature Reserve is an A Class reserve (31894) for 'Conservation of Flora and Fauna' and is 0.2ha in area. The reserve extends to low water mark.
- First Rock, Second Rock and Passage Rock are vacant Crown land.

The existing purpose of Penguin Island reflects its past use. This is now inappropriate given the better appreciation of its conservation value and changes in public attitude. Penguin Island is the central focus of all the Islands and requires a purpose consistent with -its high conservation value, and current and future visitor use. The most appropriate purpose for Penguin Island is 'Conservation Park'. This will incorporate 'wildlife and landscape conservation, scientific study, preservation of features of archaeological, historic or scientific interest, together with recreational enjoyment by the public'.

Penguin Island should retain its A Class security of tenure and be known as Penguin Island Conservation Park. Approval of this change is the prerogative of Parliament. Actions in this plan which require the status of conservation park are dependent on approval by Parliament.

First Rock, Second Rock and Passage Rock should be added to Shoalwater Bay Islands Nature Reserve. It would also be appropriate to amalgamate Third Rocks Nature Reserve and the Sisters

Nature Reserve into the reserve, so that with the exception of Penguin Island, all of the Islands are included in the one reserve. 'Bay' should be deleted from the name of the reserve as the Islands proposed for inclusion are not located in Shoalwater Bay.

The Marine Park extends to low water mark of the reserved Islands/Rocks. The Penguin Island reserve boundary needs to be changed from high water mark to low water mark. The other reserves already extend to low water mark. When the vacant Crown land is reserved the boundary should be low water mark.

The reserved Islands/Rocks are listed on the register of the National Estate.

ACTIONS

- 1. Seek to change the purpose of Penguin Island A Class Reserve to 'Conservation Park'. Change the boundary from high water mark to low water mark.**
- 2. Delete 'Bay' from the name of the Shoalwater Bay Islands Nature Reserve.**
- 3. Add First Rock, Second Rock and Passage Rock to Shoalwater Islands Nature Reserve. Ensure their boundaries extend to low water mark.**
- 4. Amalgamate Third Rocks Nature Reserve and The Sisters Nature Reserve with Shoalwater Islands Nature Reserve.**

4. POLICIES AND GOALS

NPNCA AND CALM POLICIES

This plan is based on current NPNCA and CALM policies (1992). These policies derive from legislation, principally the Conservation and Land Management Act 1984 (hereinafter referred to as the CALM Act), the 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 FOR THE SHOALWATER ISLANDS

The following management goals for the Shoalwater Islands are based on those applicable to lands managed by CALM and cover specific concerns relating to the Islands.

Conservation Goal

- Conserve biological, physical, cultural and landscape values.

Recreation Goal

- Facilitate recreation in a manner compatible with conservation and other values.

Information, Interpretation and Education Goal

- Promote informed appreciation of natural and cultural values.

Research and Monitoring Goal

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

Management objectives for specific issues are provided throughout the plan.

5. INTERACTION WITH SURROUNDING WATERS AND ADJACENT LAND

The objective is to ensure that management of the Shoalwater Islands Marine Park and adjacent foreshore is coordinated with management of the Islands.

Management of the Shoalwater Islands is an integral component of the larger scale management of the marine environment. It must, therefore, be recognised that:

- The successful management of Island wildlife relies not only on the protection of habitat and important breeding areas, but also on the protection of foraging grounds and the movement of wildlife to and from these areas.
- Recreational and commercial activities in the waters of Shoalwater Bay and Warnbro Sound may adversely affect the marine environment and Islands unless carefully managed.

A marine park extending from Cape Peron to Becher Point, including Shoalwater Bay and Wambro Sound, was established on the 25 May, 1992. The marine park is vested in the NPNCA and will be managed by CALM in accordance with a management plan to be prepared for the area.

Marine parks are established to protect waters and land of special conservation value and habitats for marine and terrestrial flora and fauna. They provide for recreational and commercial fishing and a variety of other uses consistent with conservation of the environment.

The Fisheries Department is responsible for managing commercial and recreational fishing in marine parks and nature reserves in liaison with CALM. The Department of Marine and Harbours is responsible for all boating, navigation and associated licensing. Community associations, clubs and volunteer groups also have an important input to management. Further information on the Marine Park is included in Appendix 1.

A treated wastewater outlet is located in the northern part of the marine park which discharges effluent beyond its boundaries. This is managed and monitored by the Water Authority of Western Australia (WAWA). Monitoring should involve both the effluent and its impact on the marine biota. Other outlets/pipelines are proposed; their environmental impact will be assessed in accordance with the Environmental Protection Act.

At present, the foreshore is partially developed, especially in the northern area of Warnbro Sound and southern area of Shoalwater Bay. The rapid urbanisation of this part of the coast is likely to result in increased human impact on the natural environment.

Shoalwater Bay consists of a number of reserves. The Cape Peron Recreation Area (Reserve 27853) is adjacent to the northern half of Shoalwater Bay. It is used extensively for recreation and education. Conservation values in this area complement and enhance those of the Islands. Future use of Cape Peron is presently under review.

The foreshore strip adjacent to the southern half of Shoalwater Bay is reserved for 'Recreation' (Reserves 22948 and 25119) and managed by the City of Rockingham. Land use inland from these reserves is residential. The foreshore is a popular recreation area and used as a base for water activities. Carparks, toilets and other facilities are provided.

Access to the Islands and surrounding waters is generally from Mersey Point (part of Reserve 22948, opposite Penguin Island). It has the potential to become the central facilities area (with information and interpretation) for the Shoalwater Islands and Marine Park, and possibly for the City of Rockingham. This is being investigated by the City in liaison with CALM and the Western Australian

Tourism Commission (WATC) and plans are well advanced. Development of Mersey Point will complement the facilities on Penguin Island.

The foreshore of Warnbro Sound consists of a number of reserves as well as vacant Crown land and private land. Land use inland from these areas is residential in the north (Waikiki, Safety Bay and Warnbro) with undeveloped land in the south.

A number of large projects are proposed within the City of Rockingham, many of which are foreshore developments associated with the marine environment. The environmental impact of proposed projects may be assessed by the EPA in accordance with the Environmental Protection Act. CALM and the NPNCA provide advice on specific projects.

Proposals for this coastline include the Port Kennedy Marina at Becher Point, as well as residential subdivisions. Stage I of the Port Kennedy development has received approval from the Minister for the Environment subject to certain conditions. However, on-site work has not yet commenced. To the south of Becher Point is the proposed Secret Harbour Development. This is a residential and golf course development. No work has commenced on the first stage of this project.

The Warnbro and Port Kennedy Land Conservation Districts were formed because of concerns about damage to the environment in the Warnbro area.

The shoreline of Shoalwater Bay and Warnbro Sound extends for 17 km. Most has been identified as suitable for recreational use (Fielman Planning Consultants, 1978). All future development will have potential impact on the Island and marine environments.

TABLE 1: ADJACENT LAND TENURE

Reserve No.	Purpose	Vesting	Management Agency
The Cape Peron Recreation Area (27853)	Recreation	Recreation, Camps and Reserves Board	Executive Director of Department of Sport and Recreation
Recreation Reserve (22948)	Recreation	City of Rockingham (Power to Lease for 21yrs)	City of Rockingham
Recreation Reserve (25119)	Recreation	No Vesting	City of Rockingham
Recreation Reserve (22270)	Recreation	No Vesting	----
Recreation Reserve (27475)	Recreation	City of Rockingham	City of Rockingham
Recreation Reserve (31198)	Recreation	City of Rockingham	City of Rockingham
Vacant Crown land	-----	-----	-----
Private land	-----	-----	-----
Reserve 20716	Excepted from Sale	No Vesting	-----

ACTIONS

- 1. Integrate management of the Shoalwater Islands with that of the surrounding Marine Park.**
- 2. Establish agreed working arrangements between CALM and other authorities with management responsibility to ensure values of the marine environment are maintained until a management plan is prepared for the Marine Park. Other authorities include the Fisheries Department (fish and the taking of fish), the**

Department of Marine and Harbours (boating activity and safety in navigable waters), the Water Authority of WA (effluent outlets, particularly the monitoring of discharge from outlets and the construction of new outlets), the City of Rockingham (the adjacent foreshore) and the WA Museum (historic shipwrecks).

3. Continue to liaise with the City of Rockingham, WA Tourism Commission and other relevant authorities in respect to the development of Mersey Point as the central facilities and interpretation/information site for the Shoalwater Islands (and the Marine Park).
4. Continue to liaise with the Environmental Protection Authority, Department of Marine and Harbours, Fisheries Department, Water Authority of WA, City of Rockingham, Department of Sport and Recreation, Fremantle Port Authority and the Department of Planning and Urban Development with regard to future developments that may have impacts on the Islands (and the Marine Park).
5. Minimise any negative environmental impacts of developments through formal procedures in accordance with the Environmental Protection Act (1986).
6. Establish communication links with developers, such as the proponents responsible for the Port Kennedy project and Secret Harbour development.
7. Inform the community of the presence and values of the Marine Park, and uses allowed in it.

6. ZONING

The objective is to develop a zoning system to:

- minimise the impact of recreation upon conservation values;
- minimise conflict between users, giving priority to uses depending on an appreciation of the natural environment; and
- regulate access to and on the Islands and the development of facilities.

The Shoalwater Islands have been zoned into:

- Special Conservation zones within which no public access is allowed
- Recreation zones within which access is allowed during the day.

This zoning scheme (Figure 2) was delineated by examining the distribution of flora and fauna and their vulnerability to disturbance, recreational uses and their impact on conservation values, and existing and proposed access and facilities. (Refer to Section 8 Fauna, 9 Vegetation and Flora, 19 Access and Facilities on Penguin Island, and 20 Access to Islands other than Penguin Island).

The Special Conservation Zones include areas which have threatened, restricted or sensitive species and features which require careful management and protection.

These zones have been designated primarily to protect Sea-lions and nesting sea birds. Access will be allowed through interpretive tours with CALM approved guides and by permit for purposes such as research.

Penguin Island has nesting sea birds in a variety of habitats including the sandy tombolo area, rock faces and limestone plateaux. The Little Penguins and Little Shearwaters nesting on the tombolo are vulnerable to visitor pressure, as are the Bridled Terns nesting on shoreline talus slopes. Seal Island has Sea-lions and nesting sea birds. Sea-lions compete for limited beach space with visitors. The smaller, less accessible Islands are home to roosting and nesting sea birds. Owing to the Islands' size, sea birds are easily disturbed by visitors. The conservation values of the Shoalwater Islands are discussed in more detail in sections 7 to 12.

Although the tombolo area is highly modified in parts, a long-term aim of this plan is to rehabilitate most of these sites for fauna habitat; thus Special Conservation zoning has been applied to some areas of it.

The Recreation Zones cater for day-time recreational use while maintaining a minimal impact on the overall area. They are only applicable to Penguin Island. These zones include beach areas which are variable in size.

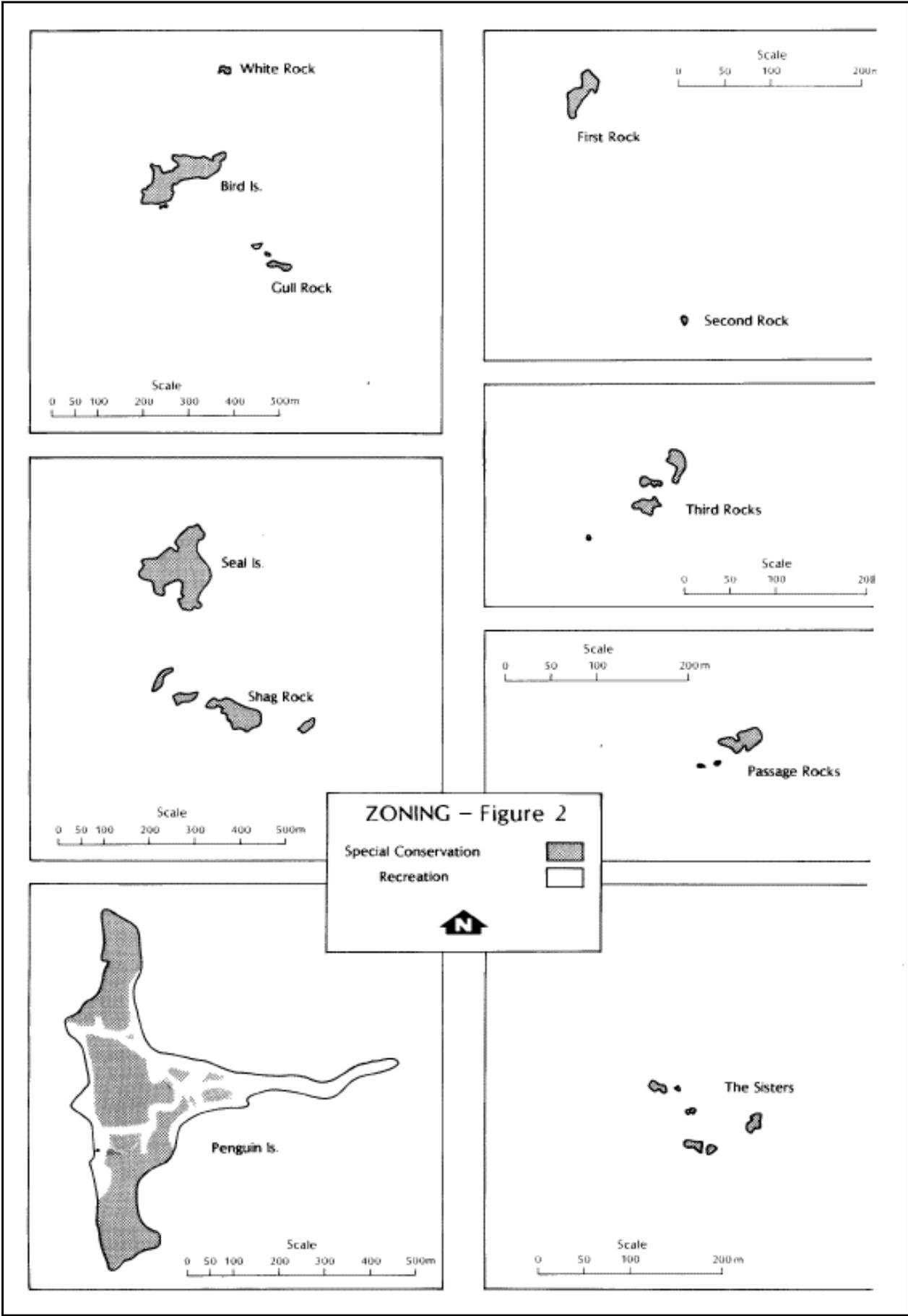
The focal point is a facility for interpretation and education. Recreation zones also include facilities used for management purposes.

Although these zones are termed recreation zones, they have conservation values. That is, the zones are conservation areas within which recreation is allowed. The larger recreation zones on the tombolo of Penguin Island include natural and rehabilitated vegetation as well as facilities.

The specific location and size of recreation zones, which include the boardwalks, walk trails, and interpretation/management and penguin viewing facilities, are subject to a site development plan. This will include liaison with relevant individuals/groups. This flexibility is necessary to ensure that disturbance to fauna and their habitat is minimised (Figure 2, provides a guide).

ACTIONS

- 1. Use the Special Conservation and Recreation zoning shown in Figure 2 as the basis for integrated management of the Shoalwater Islands.**
- 2. Advise the public of the zoning system, including, where access is and is not allowed, and the reasons for the zones.**



CONSERVATION

7. Principal Conservation Directions
8. Fauna
9. Vegetation and Flora
10. Geology, Geomorphology, Soils and Erosion
11. Aboriginal History
12. European History
13. Weeds and Planted Species
14. Pest species / Pets (Domestic Animals)
15. Fire
16. Mining

7. PRINCIPAL CONSERVATION DIRECTIONS

CONSERVATION GOAL

Conserve the biological, physical, cultural and landscape values.

OVERALL CONSERVATION OBJECTIVES

1. Conserve biological, physical, landscape and cultural values.
2. Restore areas that have been degraded.
3. Protect the natural environment from pests, weeds, fire and mining.
4. Protect the natural environment from adverse impacts resulting from visitor activities.
5. Promote conservation values in interpretation and education programs.
6. Prepare a research and monitoring program.

CONSERVATION STRATEGY

The strategy for conservation management is to reduce negative external influences as much as possible. This includes minimising conflict resulting from visitor use (Sections 17 to 21), control of weeds, pests and fire (Section 13 to 15), and rehabilitation of vegetation (Section 9). Research and monitoring (section 24) is an integral management component.

8. FAUNA

The objective is to protect and maintain viable populations of indigenous species.

The high conservation value of the Shoalwater Islands can be mainly attributed to the fauna. Although the total area of the Islands is small the fauna includes approximately 50 bird species (one introduced), six reptile species, and three mammal species (one introduced).

Most of the fauna rely on the marine environment for food; thus management of the Marine Park is an essential component in their management (see section 5). Some feed well beyond the boundaries of the Marine Park, for example, the White-faced Storm Petrel, Little Shearwater and Bridled Tern.

Birds use the Islands and their surrounds for courtship, nesting, feeding and/or roosting. Fourteen species nest on the Islands, including 12 sea birds: Little Penguin (*Eudyptula minor*), Little Shearwater (*Puffinis assimilis*), White-faced Storm-petrel (*Pelagodroma marina*), Pied Cormorant (*Phalacrocorax varius*), Pied Oystercatcher (*Haematopus ostralegus*), Silver Gull (*Larus novaehollandiae*), Roseate Tern (*Sterna dougallii*), Caspian Tern (*Hydroprogne caspia*), Bridled Tern (*Sterna anaethetus*), Crested Tern (*Sterna bergii*), Fairy Tern (*Sterna nereis*), Little Pied Cormorant (*Phalacrocorax melanoleucos*); a water bird, the Buff-banded Rail (*Rallus philippensis*); and a land bird, the Singing Honeyeater (*Lichenostomus virescens*). The Sooty Oystercatcher (*Haematopus fuliginosus*) may also nest on the Islands. In addition the feral pigeon (**Columba livia*) nests here. Their combined nesting habitat covers most of the Islands' area, from crevices in rock faces, and burrows in the sand, to hollows in the vegetation.

Some species have special status as they are listed under the Migratory Bird Agreements between Australia and Japan and/or China. These include the Caspian Tern and Bridled Tern (listed as 'breeding species'), and visiting waders such as the Ruddy Turnstone (*Arenaria interpres*), Whimbrel (*Numenius phaeopus*) and Bar-tailed Godwit (*Limosa lapponica*). Australia has a responsibility under the Agreements to protect these species.

The Islands off the metropolitan coast are the northernmost limit of the Little Penguins' range. This population is isolated and distinct in size, and has larger individuals than found elsewhere. It may represent a sub-species (Klomp and Wooller, 1988). The numbers of Penguins breeding on Penguin Island vary widely and up to 500 breeding pairs have been documented; however, their participation rate varies (Dunlop *et al.*, 1988) (Figure 3 page 23). It appears that only about 20% of Penguins which can reproduce do so in any one year and that these Penguins nest in the least disturbed locations (B Wienecke pers. comm. 1990). A few pairs nest on Seal Island and some have been observed and may nest on Bird Island and Shag Rock.

The Penguins nest under low, dense vegetation. They will also nest under buildings and other structures and adopt artificial nest boxes quite readily. Penguins are nocturnal on land, with most making their landfall within two hours of sunset, generally landing in small flocks. The size of the flock varies seasonally and can range up to 15 birds prior to laying. They are most sensitive to disturbance when landing. Seasonally they are most vulnerable to disturbance when moulting (around January) and during the peak laying period (around July, August and September). Penguin Island is closed to the public annually during the peak laying season to ensure the birds are not disturbed (refer to Section 19. 1). However, Penguins breed most of the year.

The nucleus of the colony inhabits the tombolo area of Penguin Island. This area was partially covered by buildings and walkways and planted with grass and trees. However, removal of buildings

and rehabilitation of these sites is well advanced. A facility plan has been prepared for this area and is discussed in Section 19. Rehabilitation is discussed in Section 9 and Appendix 2.

A means for visitors to view Penguins will be provided (see section 22, Information/Interpretation and Education). When locating and designing this facility the biology of the Little Penguin will be carefully considered.

Little Shearwaters occupy at least 12 burrows within the tombolo area of Penguin Island (Figure 3 page 23). An additional small sub-colony of about four nests occurs outside the tombolo area. Prior to their discovery in 1982, the only known breeding site for this species in the metropolitan area was at Parakeet Island off Rottneest Island, and this colony is thought

to have disappeared. As with the Little Penguin, many of the Little Shearwater nest sites are closely associated with built structures in the tombolo area. Evidence shows that small populations of Little Shearwaters are vulnerable to disturbance. Little Shearwaters in the tombolo area excavate small, shallow burrows under the low, dense vegetation and these may cave in if walked on (Dunlop, 1988).

Approximately 400-500 pairs of Pied Cormorants nest on either Shag Rock, Seal Island or Bird Island between late February and early July. Visits by people to Shag Rock and Bird Island are infrequent due to their rocky nature and lack of landing sites; however, populations are disturbed by boats approaching the Islands too closely, particularly during the breeding season.

Caspian Terns and Crested Terns often nest on the Islands, and in the 1989 breeding season, both species nested on the Islands. The success of these nesting events is often hampered by disturbance. This is true of all sea birds nesting on the Shoalwater Islands.

The Roseate Tern intermittently nests on Second Rock and a small unnamed rock off Point Peron. It could nest on the other rocks which provide a similar habitat. The Islands south of Penguin Island have not been subject to as much research as those to the north.

The Bridled Tern, which migrates to the Shoalwater Islands to breed during the summer months, numbers up to 1000 pairs on Penguin Island. It can be easily seen on its nests on rock ledges and talus slopes (Figure 3). This leads to human interference with eggs and chicks. Furthermore, feral pigeons appear to be competing for nesting space, presumably to the detriment of the Bridled Tern (refer to Figures 3, 5). The Bridled Tern is suffering abnormally high adult mortality which is making the population vulnerable to decline (Dunlop and Jenkins, pers. comm. 1991).

The Silver Gull, an indigenous species, occurs in high numbers in the metropolitan area due to the availability of food from unnatural sources. Its numbers may have a detrimental effect on other species on the Islands and thus it can be considered a pest (see Section 14).

Three species of mammal occur on the Islands. Australian Sea-lions (*Neophoca cinerea*) traditionally land and rest on Seal Island and occasionally on Penguin Island and Bird Island. The other Islands in Shoalwater Bay and Wambro Sound have no suitable area on which Sea-lions can beach. The New Zealand Fur Seal (*Arctocephalus forsteri*) is an infrequent visitor to Seal Island. The house mouse (*Mus musculus*), an introduced species, is common on Penguin Island.

The Australian Sea-lion is a species gazetted as in need of special protection because past commercial exploitation reduced its numbers to low levels from which it has recovered only partially to date, and because it requires special protection against illegal destruction and disturbance to its habitat. These animals move mainly between six Islands in the metropolitan area, five of which are subject to high levels of visitor use. The Seal Island group may range in number from two to 35 and is composed of adult and sub-adult males. These animals rest in this area and migrate about every 18 months to Islands in the Jurien Bay area to breed.

Conflict occurs on Seal Island between people and Sea-lions for limited space. Sea-lions may occupy most of the foreshore. CALM staff have observed up to 60 people and 16 boats on the beach area with 22 Sea-lions. People frequently disturb the Sea-lions, some accidentally (for example, noise from boat engines) and others purposely to make them move. SCUBA divers are known to entice Sea-lions into the water so they can dive around them. Hand feeding animals is a novelty and Sea-lions now approach boats seeking fish.

The beach is used for games, such as cricket, and as a base for water activities. These activities are adequately catered for on the mainland and are not appropriate on Seal Island.

There have been incidences of animals being speared and shot as well as injured by boat propellers and 'skegs'. CALM statistics show that over 33 percent of recorded injuries/deaths in the metropolitan region are due to unnatural causes.

Protection of Sea-lions in the water (and their food source) is of equal importance and will be given consideration in management of the Marine Park.

Six species of reptile are found on the Islands. All six species occur on Penguin Island. Three species, including the King Skink (*Egernia kingii*) are common, two species less common, and one species is scarce. The Fence skink (*Cryptoblepharus plagiocephalus*) is probably recently introduced. Only

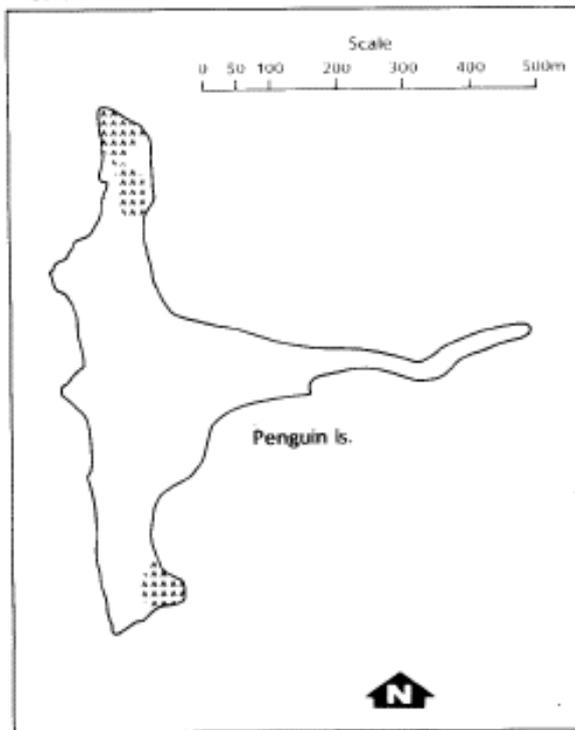
one, the Marbled Gecko (*Phyllodactylus marmoratus*), is known to occur on some of the smaller Islands.

ACTIONS

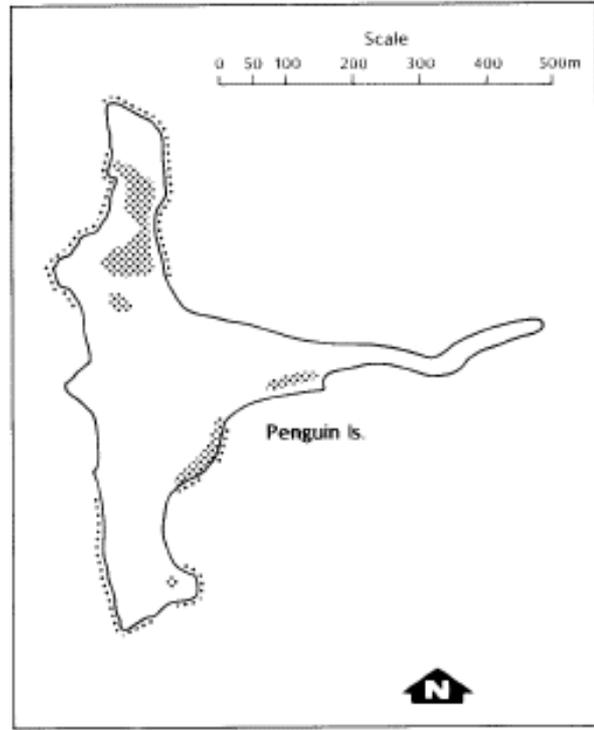
- 1. Encourage research and monitoring to aid future management (see Section 24).**
- 2. Guide or prohibit public access where necessary so that conservation values are protected (see Sections 19 and 20). Continue patrols of the Islands by CALM staff, particularly when fauna needs protecting most and/or during peak visitor use. Continue to enforce the CALM Act and the Wildlife Conservation Act as necessary.**
- 3. Control weeds and pest species (see Sections 13 and 14).**
- 4. Through the use of a public education program ensure visitors are aware of the fragility of the Islands' ecosystem, location of conservation areas and reasons for access restrictions. Develop interpretive potential with emphasis on the importance of wildlife, appropriate behaviour towards wildlife, and the need for protective measures to ensure their conservation (see Section 22).**
- 5. Maintain and/or rehabilitate fauna habitat (see Section 9).**
- 6. Minimise disturbance of Little Penguin, Little Shearwater and other species when implementing management actions.**
- 7. If needed and possible, divert surface nesting species to most protected areas in suitable habitat via habitat modification, decoys and vocal luring. Continue to encourage research.**
- 8. Integrate management of the Islands and Marine Park.**

WILDLIFE MANAGEMENT – Figure 3

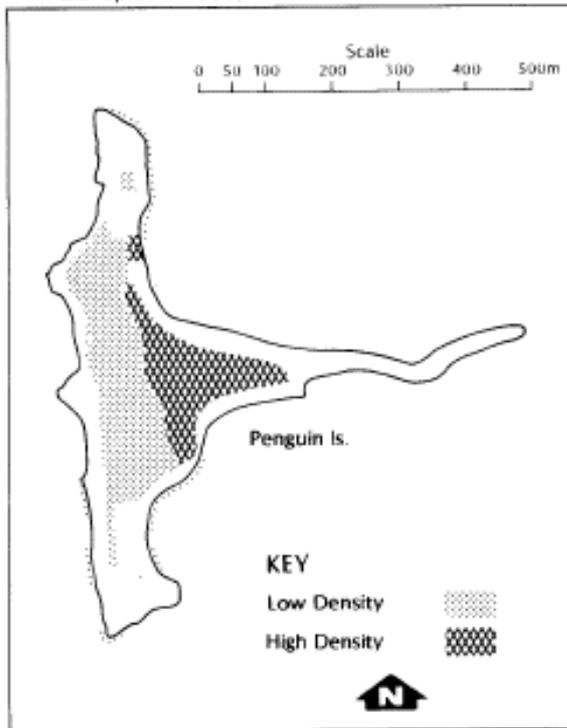
Conservation



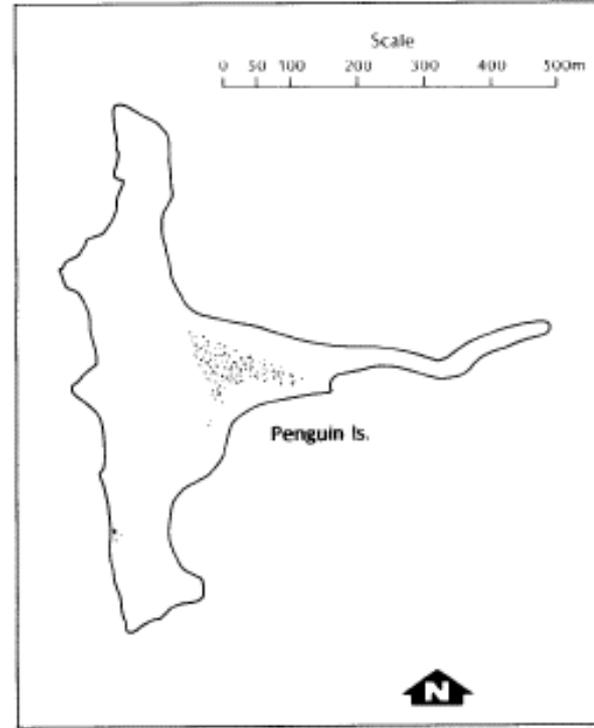
(a) Potential Crested Tern (*Sterna bergii*) Breeding Areas
 (Source: Pobar, CALM pers. comm., 1990; Dunlop et al. 1988)



(b) Bridled Tern (*Sterna anaethetus*) Distribution
 (Source: Dunlop et al. 1988)



(c) Little Penguin (*Eudyptula minor*) Distribution
 (Source: Dunlop et al. 1988)



(d) Little Shearwater (*Puffins assimilis*) Distribution
 (Source: Dunlop et al. 1988)

9. VEGETATION AND FLORA

The objective is to protect and maintain vegetation communities, including their structure, diversity and distribution.

The vegetation on the Shoalwater Islands continuously changes through natural influences. The most important factor inducing change is the fauna, specifically the roosting/nesting sea birds. The type of vegetation communities that occur on the Islands is associated with the physical factors of soil depth, sand mobility and exposure to salt spray. With disturbance of the vegetation the erosion potential of exposed soils is high. However, species living in this environment are hardy and regenerate if given the opportunity.

Eight vegetation communities were described for the Shoalwater Islands by Chape (1984). All occur on Penguin Island (Figure 4). The other Islands within the group have a less diverse range of habitat and consequently fewer plant communities. Some have no vegetation. On Gull Rock the vegetation is restricted to the *Nitraria billardieri* community. This community also occurs on Bird Island and Shag Rock along with stands of *Lavatera pleibea* var. *tomentosa*. Seal Island, which is slightly larger with some sand dune habitat, also has the *Carpobrotus - Frankenia*, *Spinifex - Tetragonia decumbens* and *Rhagodia baccata* communities (Chape. 1984). White Rock, First Rock, Second Rock, Third Rocks, Passage Rock and The Sisters have no vegetation.

***Spinifex - Tetragonia decumbens* community:**

Plants in the community are the primary colonisers of the eroded coastal dune areas. *Spinifex longifolius*, *S. hirsutus* and *Tetragonia decumbens* completely dominate the foredunes and mobile dunes on both sides of the Island. With the increased stabilization associated with the swale behind the foredunes, species such as *Lepidospermum gladiatum* become more important plants in this community.

***Tetragonia decumbens* community:**

Sea Spinach (*Tetragonia decumbens*) is an opportunistic species colonising disturbed areas, particularly those subject to wind erosion. It is native to South Africa, but has an important role in stabilizing exposed areas.

***Olearia axillaris - Scaevola crassifolia* community:**

This community is generally located back from the foredunes on the next line of dunes. The dominant species, *Olearia axillaris*, occupies a variety of habitats ranging from the exposed walls of blow-outs to the sheltered heaths behind the dunes.

***Alyxia buxiflora - Scaevola crassifolia* community:**

This community is located in the central dune area, more specifically on the crest and windward (western) side of the slopes. *Alyxia buxifolia* occupies the more stable sites within this area, while *Scaevola crassifolia* is associated with the more exposed, disturbed locations. Other less dominant species include; *Spyridium globulosum*, *Angianthus cunninghamii*, *Conostylis candicans* and *Acanthocarpus preissii*.

***Acacia rostellifera* community:**

Species in this community cover the eastern (leeward) slopes of the central dunes and the swale seaward of the main dune crest. Large thickets of the medium-sized shrub *Acacia rostellifera* dominate these sheltered, stable areas. Other plants associated with the *Acacia* thickets include *Myoporum adscendens*, *Alyxia buxifolia* and various climbers. This community represents one of the final stages in the succession of coastal dune vegetation on Penguin Island.

***Nitraria billardieri* community:**

Plants in this community are the primary colonisers of the coastal limestone areas. *Nitraria billardieri*, the dominant species, occurs on the edges and crumbling slopes of the limestone cliffs. Other common plants in this harsh habitat include: *Tetragonia implexicoma*, *Threlkeldia diffusa*, *Enchylaena tomentosa* and *Carpobrotus virescens*.

***Carpobrotus virescens* - *Frankenia pauciflora* community:**

This community is found on the shallow soils of the limestone plateau and along the edges of the plateau. *Carpobrotus virescens* dominates on the plateau, while *Frankenia pauciflora* emerges as an important species in areas subject to salt spray, such as along the northern and western edges of the northern plateau. Where pools of seawater form on the foreshore limestone there are populations of halophytes. These include *Sarcocornia australis*, *Enchylaena tomentosa*, *Sporobolus virginicus* and *Wilsonia backhousei*.

***Rhagodia baccata* community:**

The Berry Saltbush (*Rhagodia baccata*) dominates the sandier parts of the limestone plateau. Towards the limestone cliff edge the trailing herbs *Carpobrotus virescens* and *Threlkedia diffusa* becomes more conspicuous. This community is favoured by the Silver Gulls for nesting.

Where the vegetation is disturbed, stands of *Lavatera plebeia* var. *tomentosa* and *Lavatera arborea* (an introduced species) appear. Many exotic herbs and grasses, favoured by high soil nitrogen levels and constant disturbance, have also invaded the seabird rookery areas.

Penguin Island

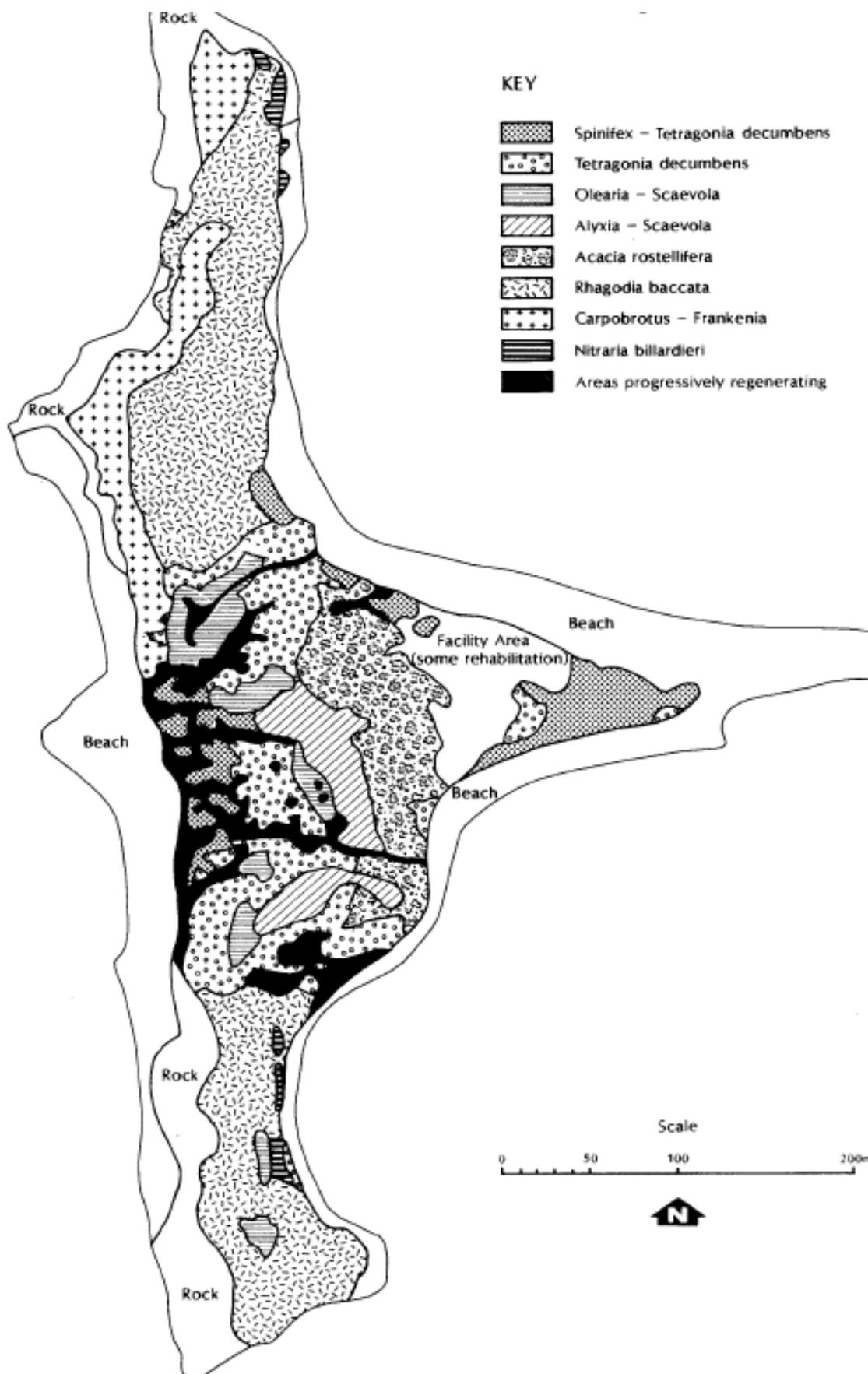
The central dune area of Penguin Island was badly eroded. However, as a result of guiding access and rehabilitating exposed areas, there has been extensive regeneration of the vegetation. Marram Grass (*Ammophila arenaria*) was planted in small areas to stabilise dunes, but has since almost died out.

Rehabilitation of the tombolo area will be required after building removal to provide nesting habitat for species such as the Little Penguin and the Little Shearwater. Methods of rehabilitation are outlined in Appendix 2.

Since 1983 there has been noticeable degeneration in the *Acacia rostellifera* stands in the north part of the tombolo. In dune areas wattle is short lived (7-14 years) and typically regenerates by suckering outwards into open ground. The pattern of the senescent plants in the centre, with vigorous new growth on the edges indicates that the degeneration is probably natural.

Figure 4 VEGETATION COMMUNITIES OF PENGUIN ISLAND

(Sources: Chape, 1984 updated, 1990)



On the mainland, fire plays a part in regenerating the dead areas of *Acacia rostellifera*, clearing away the deadwood and stimulating seed germination and suckering from rootstock. However, there will be no prescribed burning on the Islands for the period of this plan (see Section 15 for justification).

The Cheesewood (*Pittosporum phylliraeoides*) is an attractive small tree which grows on the sheltered eastern coast of Penguin Island. Two subspecies of Cheesewood occur - the coastal form and the inland weeping form. This species is an ecological relic of a drier period in history. It is the plant most in danger of extinction on Penguin Island although it does occur on the mainland and on Garden and Rottneest Islands.

Two stands of Cheesewood survive on Penguin Island, one close to the northern walktrail and one on the north-eastern talus slopes. The stand near the walktrail is heavily overgrown with *Tetragonia* while the one on the talus slopes was nearly eliminated by a rockfall. All plants are mature and produced fruit during March and April, 1988 (N Dunlop, pers. comm.). Management intervention is required to assist their preservation.

Seal Island, Shag Island, Bird Island and Gull Rock

The sea birds on these Islands and the Australian Sea-lion on Seal Island, cause frequent changes to the vegetation. The vegetation on both Bird and Seal Islands and Shag Rock is always at various stages of regeneration mainly due to the impact of trampling and manuring by nesting and/or roosting Pied Cormorants. The Cormorants effectively make their current colony areas uninhabitable by destroying the woody *Nitraria* bushes on which they nest, and thus must rotate their breeding areas every four to five years (Wooller and Dunlop, 1981). Sea-lions have created some bare areas on the eastern margin of the *Rhagodia* community on Seal Island.

Silver Gulls appear to have had a significant impact on the vegetation. Their activities result in vegetation loss through trampling and an increase in nitrogen to the soil. This provides an ideal environment for weeds. Terns also cause vegetation change. However, their impact is over small and naturally sparsely vegetated areas.

An unusual vegetation type, Australian Hollyhock (*Lavatera pleibea* var *tomentosa*) - a low open shrubland - occurs on the plateau of Shag Rock and Bird Island. The Australian Hollyhock is an Island endemic which has been largely replaced by the introduced Tree Mallow (*Lavatera arborea*) in the metropolitan region - for example, on Green Island off Rottneest, (G. Keighery, CALM, pers. comm.). This mostly occurs in areas with high levels of nitrogen due to nesting sea birds. Studies over the past three years have shown that this occurs in the Shag Rock and Bird Island Cormorant colonies and in the Penguin Island Silver Gull colonies.

All other communities are widespread on other Western Australian offshore Islands.

ACTIONS

- 1. Minimise disturbance to vegetation by guiding visitors along paths and beaches and prohibiting access in special conservation zones (see Sections 19.2 and 20).**
- 2. Continue to rehabilitate degraded areas, including the Penguin Island tombolo area after buildings have been removed. If possible, ensure seeds and cuttings propagated are taken from the Island on which they are to be planted. Use methods outlined in Appendix 2 where suitable.**
- 3. Monitor regeneration of *Acacia rostellifera* on the northern section of the tombolo and recognise degeneration as part of its natural cycle.**
- 4. Monitor the regeneration of the Cheesewood and, if needed, instigate measures to protect this species, such as trial cutting *Tetragonia*. If possible, take the seeds from the Island on which seedlings are to be planted (in order to maintain genetic integrity).**
- 5. Monitor vegetation changes on the Islands. Monitor rehabilitation and, using ongoing results, revise techniques as required. (Recognize that the vegetation changes over time and does not need management).**
- 6. Control weeds, especially *Lavatera arborea* which is causing the loss of the native *Lavatera* shrubland (see Section 13).**
- 7. Develop interpretive potential of the vegetation, including species, communities and their relationship with the physical environment and fauna.**

10. GEOLOGY, GEOMORPHOLOGY, SOILS, AND EROSION

The objectives are to:

Protect and maintain geological and geomorphological features and soils. Minimise erosion resulting from visitor use and management activities.

The Shoalwater Islands and reef system form part of a partially submerged ridge of limestone. The ridge lies parallel to the adjacent coast and extends northwards from the Murray Reefs which begin approximately 40 km south of Penguin Island.

The ridge is composed of aeolianite limestone which was formed from the leaching of calcium carbonate from the surface of Pleistocene coastal dunes, and its redeposition as limestone at lower levels. It has been greatly eroded by wind and water as the sea has risen and fallen a number of times over a long period. This is a continuing process of chemical and mechanical weathering.

The Islands themselves indicate the presence of the ridge above sea level. The Islands are elevated limestone plateaux, their geomorphic complexity increasing with the size of the Island.

The repeated dissolution and redeposition of limestone results in a variety of formations (termed karst) including a hard crust across the surface (travertine crust) or hollow, vertical channels (solution pipes). These features withstand erosion while the softer areas are weathered away, thus forming caves, natural archways and other formations. Occasionally they collapse resulting in rock slopes (talus). Many of these limestone features have taken years to form and can be easily damaged by visitors. Collapses may be exacerbated or caused by human activities and can be a safety hazard.

In comparison to other limestone caves in south-western Australia the caves on the Islands have no features of special interest such as stalactites and stalagmites.

Soils are derived from weathering of the bedrock (yellow-tinged colour), wind deposited sand of marine origin (white) and organic material (pinkish-brown colour). The organic content is generally low. However, in areas inhabited by seabirds the soil is enriched by nitrogenous excretory matter. The larger Islands have small to extensive dune systems. The most well developed system occurs on Penguin Island which has the greatest soil profile development and lithification. The organic content of dune sands is low to non-existent. When vegetation is disturbed the erosion potential of the soils is generally high.

Shoalwater Bay and Wambro Sound are subject to short-term sand buildup and scouring due to environmental factors such as winter storms, and also to long-term patterns of accretion and erosion. Because of this, tombolos², sandbanks and beaches are very mobile. When the area was originally surveyed in 1837, the Penguin Island tombolo was completely vegetated with foredune plants from Island to mainland. Partially submerged tombolos connect Penguin, Bird and Seal Islands to the mainland. The Penguin Island tombolo is the shallowest and as a result visitors can wade across the sandbar.

2 Tombolos are bars of sand that link an island to the mainland.

Reef platforms surround some of the smaller Islands. On Penguin Island they occur along or adjacent to the southern, western and northern sides (Section 5, Interaction with Surrounding Waters and Adjacent Land).

Erosion on the Islands is occurring naturally due to wildlife movements and to weathering processes. Vegetation constantly regenerates and undergoes succession. In the absence of human pressures the vegetation may naturally recover.

Storms erode the beaches on Penguin Island, damaging both habitats and facilities. Measures taken to prevent further loss of sand have only been partially successful. Storms with high winds and tides create concern about the stability of the tombolo. Sand deposition and erosion must be accounted for in management planning, for example, when planning facilities.

Measures have been taken since 1983 to halt severe erosion caused by high levels of use and uncontrolled access. This has resulted in the rehabilitation of much of the vegetation. This process is continuing. Rehabilitation is further discussed in Section 9 and Appendix 2.

In the longer term, unnatural changes to the environment may occur due to climatic change. However, their combined effects on the environment are difficult to predict. Some changes may counteract each other. Future sea level rises and an increase in the number and severity of storms have been suggested as a result of the Greenhouse Effect. If this is the case, the lower lying areas on the Islands will be most vulnerable.

ACTIONS

- 1. Monitor naturally caused erosion, particularly erosion of the beaches, sandbars and tombolo area, and that caused by nesting and roosting birds. Rehabilitate, if required (generally no action is needed).**
- 2. Inspect caves and other limestone formations on a regular basis and when necessary, close them to protect their values and the safety of visitors. Erect cave risk signs where needed.**
- 3. Direct visitors away from areas subject to erosion. Rehabilitate areas eroded as a result of visitor use.**
- 4. Consider erosion potential when assessing site developments.**

5. **Develop interpretive potential of the limestone formations, including information on geological processes, the fragility of the formations and the need to protect them.**
6. **Consider long-term natural and unnatural changes to Penguin Island, particularly to the tombolo area and Island's foreshore, when selecting and locating access and sites for facilities.**
7. **Monitor the rehabilitation of vegetation in eroded areas and instigate actions if needed.**

11. ABORIGINAL HISTORY

The objectives are to:

Identify and protect Aboriginal cultural features on the Shoalwater Islands.

Encourage greater understanding and appreciation of their cultural heritage.

Aboriginal sites and objects are protected in accordance with the Aboriginal Heritage Act 1972. No sites are registered on the Shoalwater Islands. However, no known archaeological and ethnographic surveys have been conducted.

It is likely that the Islands were utilised to some extent by Aboriginal people both before the rise in sea level when the Islands were a part of the Swan Coastal Plain and afterwards. Records show the Plain was rich in resources and consequently supported a fairly dense population of Aboriginal people.

Recently Aboriginal people have shown an interest in re-establishing cultural links with areas in the south-west that their ancestors previously inhabited (CALM, 1991). These south-west people are known collectively as Nyungar, although their Aboriginal heritage is derived from various tribes and language groups. CALM is currently liaising with some of these people with the aim of developing an interactive program.

ACTIONS

1. **Report Aboriginal artefacts or other findings to the Department of Aboriginal Sites, Western Australian Museum.**

2. **Ensure recorded Aboriginal sites are not disturbed.**
3. **Encourage archaeological and ethnographic surveys of the Islands.**
4. **In consultation with concerned Aboriginal people, develop interpretive potential of Aboriginal interaction within the area.**

12. EUROPEAN HISTORY

The objective is to protect European cultural features on the Shoalwater Islands.

Penguin Island was first gazetted in 1918 as a reserve for Public Utility. One of the earliest residents in the Safety Bay area was 'Seaforth' McKenzie, an eccentric mining engineer. He lived on Penguin Island from about 1918 to 1929 in caves he excavated from the limestone on the north and north-east foreshore, and in a dwelling constructed near the Island's centre.

During the 1920s Penguin Island became a favourite recreation destination. Some visitors camped on the Island in the caves where 'Seaforth' was regarded as 'King'. Towards the end of the decade the aging McKenzie moved to Mersey Point and the caves deteriorated and become uninhabitable. People, however, still continued to visit the Island by walking the sandbar or by boats.

In 1945, administration of Penguin Island was passed to the Rockingham Road Board and the gazetted purpose of the Island was changed to 'Recreation'. The State Gardens Board took control of the Island in 1949 and the purpose of the reserve was changed to 'Recreation and Camping'. The reserve was vested in the National Parks Board in 1957 and was gazetted an 'A Class' Reserve in September 1966.

In 1969, Penguin Island Pty Ltd purchased the leasehold portion of the Island. A water pipeline was laid from the mainland to the Island in 1970 and a telephone cable was laid in 1972. Accommodation facilities included a caretaker's residence, ablution blocks, a shop and overnight units. Pines, figs and other exotic and native species were planted (see Section 13, Weeds and Planted Species).

With proclamation of the Conservation and Land Management Act 1984, vesting of the Island passed to the National Parks and Nature Conservation Authority. The lease was terminated through purchase in August 1987, following negotiations between the lessee and CALM.

ACTION

- 1. Research past uses of the Islands, for example, during the colourful 'Seaforth' McKenzie era, and include this information in the interpretive programs.**

13. WEEDS AND PLANTED SPECIES

The objectives are to:

Minimise the detrimental impacts of weeds and weed control on the flora and fauna.

Minimise the detrimental impacts of species planted on Penguin Island on its ecological and natural landscape values.

Weeds generally grow to the detriment of indigenous plant species, but some may provide an important interim stabilising role. Weeds that have a detrimental impact on major conservation values require control.

Many weeds species occur on Penguin Island, including on the sheltered tombolo area and on the plateau where there is trampling and a high nitrogen in the soil from bird colonies (from faeces). Weeds are also a problem on Seal and Bird Islands and Shag Rock. *Lavatera arborea* is of particular concern on Shag Rock and Bird Island as it competes with the native *Lavatera plebeia* var. *tomentosa*, and replaces this vegetation community. A program to remove *L. arborea* should commence as soon as possible. Weeds occur to a lesser degree on the small, rocky Islands/rocks that are more exposed to salt and wind and where weeds may have greater difficulty in becoming established.

Weeds can be controlled by physical/mechanical, chemical or biological means. Many forms of control may not be appropriate because of their effect on fauna, fragile vegetation and readily erodible soils. Care must, therefore, be exercised when choosing methods of weed control and in implementing these measures. Most effective methods are often the most labour intensive.

A variety of introduced native and exotic trees have been planted in the tombolo area of Penguin Island. Introduced natives include *Agonis flexuosa*, *Eucalyptus gomphocephala*, *E. platypus* and other melaleucas and eucalypts. Exotics include Tamarisk trees, Norfolk Island Pines and figs. The species which are detrimental to the Islands conservation values should be removed. These areas

should be rehabilitated with indigenous species, if possible using seeds and cuttings taken from the Island on which they are to be planted.

Trees and/or shrubs will be required for shade in the informal picnic area (complemented by structures). Species that could be suitable for use are the Cheesewood, *Acacia cyclops* and *Melaleuca lanceolata*. Existing *M. lanceolata* will be retained if in suitable locations or will be removed last if other species are used for shade trees. Use of non-indigenous species for shade will be allowed if there are no suitable alternatives.

ACTIONS

- 1. Control detrimental weeds in accordance with CALM policy.**
- 2. Map the extent of weed infestations on each Island, and examine their impact on indigenous species. Update periodically.**
- 3. Investigate methods of weed control and consider the impact of control methods on the environment.**
- 4. Develop a weed control plan. Priority should be given to controlling weed species that have the greatest detrimental effect on indigenous flora and fauna. Seek volunteer assistance to control weeds.**
- 5. Progressively remove *Lavatera arborea* (Tree Mallow) over a five year period. Mark specimens of this species prior to their removal, to ensure that the indigenous *Lavatera* species are not removed.**
- 6. Progressively remove non-indigenous vegetation that is detrimental to the conservation values of Penguin Island. Through a communication program inform the community of the removal of these species and the reasons.**
- 7. Allow use of non-indigenous species for shade if necessary, subject to strict assessment with advice from relevant persons within CALM.**

14. PEST SPECIES/PETS (DOMESTIC ANIMALS)

The objectives are to:

Control pest species (that is, those species having an adverse effect on major conservation values).

Ensure that the effects of control measures on the environment are minimised.

Prohibit feral animals and pets (domestic animals).

Silver Gulls are an indigenous species (native to the locality) which have increased dramatically in numbers since the 1940s when about 200 pairs were recorded on the Shoalwater Islands. Recent estimates indicate over 4 000 pairs, of which up to 3 000 pairs inhabit Penguin Island (Figure 5a). The characteristics of this colony are typical of sea birds and provides interpretive opportunities.

The Gull population growth is unnatural and is related to urban development and the increased availability of food, often from rubbish tips. Control of the Silver Gulls unnatural proliferation is necessary to minimise adverse impacts on other indigenous species.

Limiting available foods is considered the best method of control. The Rockingham rubbish tip is a major source of food for the Shoalwater Islands' colonies (pers. comm A.A. Burbidge). A new tip is planned for 1992. The City of Rockingham is investigating methods of control that can be incorporated in the tip's design and ongoing management (pers. comm. ,City of Rockingham). Liaison with managers of other landfill sites and potential food sources is required.

Control of Silver Gull populations by local reduction of breeding success at colonies is difficult. Methods of control at colonies include culling the breeding adults, destroying their eggs or preventing their eggs from hatching. Control at breeding colonies would need to be an annual operation if nothing was done to control food availability.

The control of Silver Gulls, other than by indirect methods such as limiting the unnatural food supply, on a conservation reserve and elsewhere is a sensitive issue as they are an indigenous species. Thus CALM and other bodies are required to follow stringent procedures, including obtaining the appropriate licence, in accordance with wildlife regulations. Control measures will be primarily aimed at reducing their 'unnatural' food source. Control on the Islands will be instigated at specific sites if considered necessary for conservation purposes. Some visitors consider the gulls a nuisance due to their noise, swooping behaviour and defaecation but these are not valid reasons for control.

Pigeons, which are not a native species, are relatively new inhabitants of the Islands. CALM staff have observed the population of a few hundred birds on the Islands in 1986 grow to approximately 2 000 birds at January, 1992. They appear to compete directly with the migratory Bridled Tern, inhabiting the small crevices on vertical faces of rocky outcrops and on talus slopes. Pigeon control on the

Islands is difficult because of the inaccessibility of roosting sites as well as potential dangers to indigenous species.

The distribution of pigeons shows that Bird Island and White and Gull Rocks have the highest densities (figure 5b). Priority areas for control are those where conservation values are being most detrimentally affected and where highest densities occur. The Co-operative Bulk Handling (CBH) grain terminal in Kwinana has been identified as a major food source for the island pigeons. The birds feed on spilled grain. CALM and CBH have combined efforts to reduce the pigeon population at the grain terminal, and pigeons on the Islands.

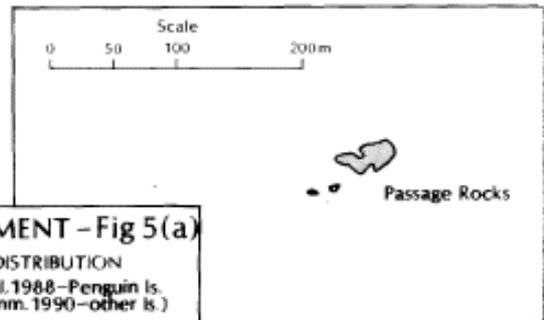
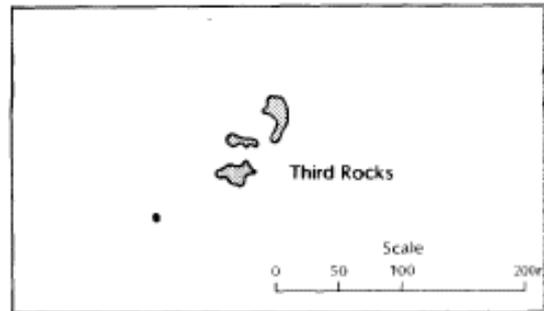
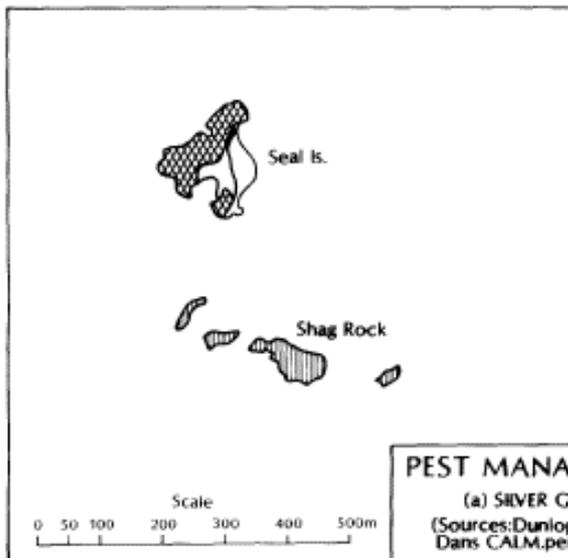
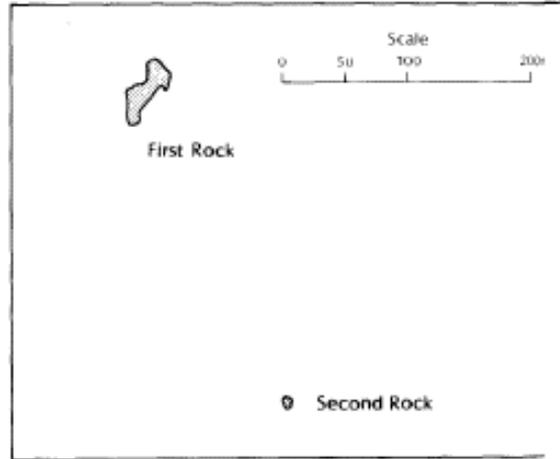
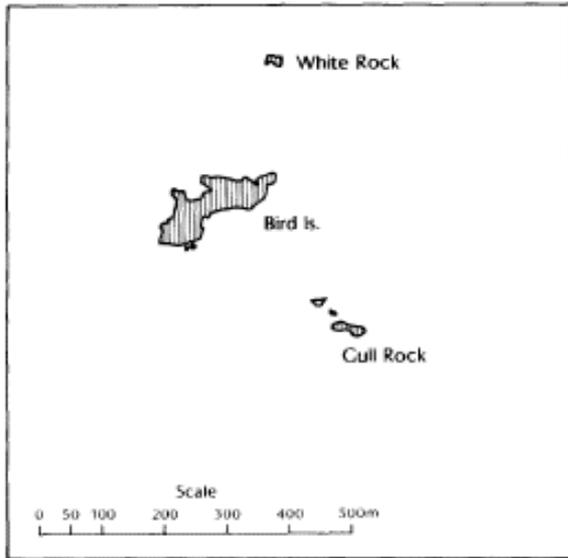
The introduced house mouse is common on Penguin Island. The need for control of this species requires investigation.

CALM staff have occasionally observed domestic pets on the Islands. Pets and feral animal may disturb, maim and possibly kill native fauna.

ACTIONS

- 1. Determine the most appropriate methods of controlling Silver Gulls with due consideration to the effects on other species.**
 - Continue to liaise with the City of Rockingham and other relevant authorities concerning availability of food for Silver Gulls at local landfill sites and other food sources. Investigate the options to limit the food source and other methods of controlling Silver Gulls at the food source.**
 - Continue to liaise with researchers, the City of Rockingham and others studying Silver Gull activities. Promote the study of their impact on other indigenous species and methods of control, particularly in specific areas on the Islands such as where Terns nest or rehabilitation sites. Instigate additional methods of Gull control (together with limiting their food source) as required.**
 - Ensure the appropriate procedures are carefully followed.**
- 2. Initiate a pigeon control program on the Islands. Consider the use of various control methods including shooting. Monitor the results of the program.**

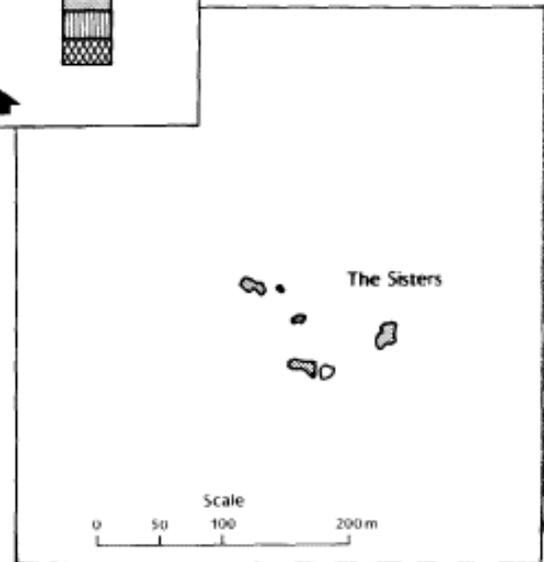
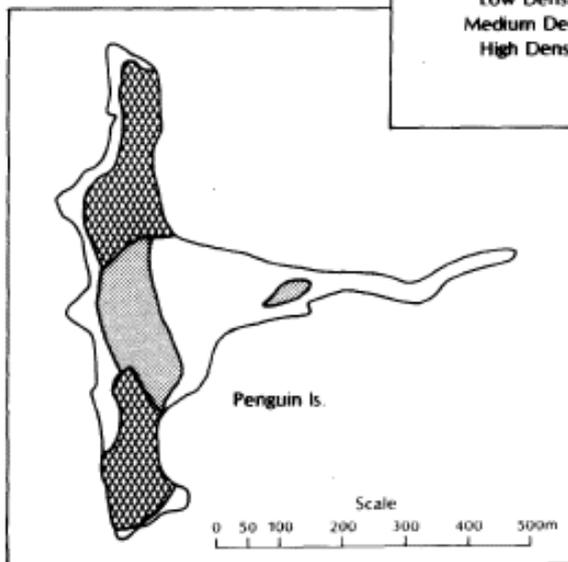
- 3. Continue liaison with CBH and other relevant managing agencies regarding the control of pigeons. Encourage CBH to initiate hygiene measures to reduce spillage of grain.**
- 4. Initiate a public education program to inform the local community and visitors of the Silver Gull and pigeon problem.**
- 5. Develop the interpretive potential of the Silver Gull colony (for example, breeding cycle and behaviour).**
- 6. Investigate the impact of the house mouse and methods of control and initiate a control program if possible.**
- 7. Continue to prohibit pets (domestic animals) and feral animals on the Islands, strictly enforcing these regulations. Inform the public.**

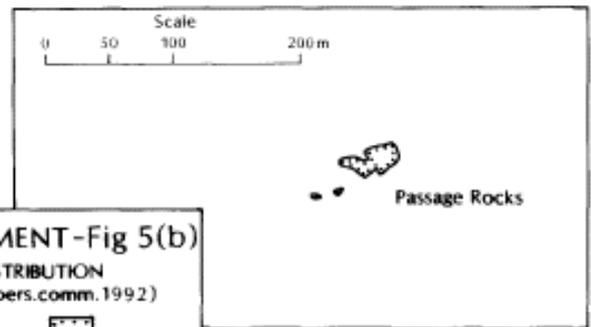
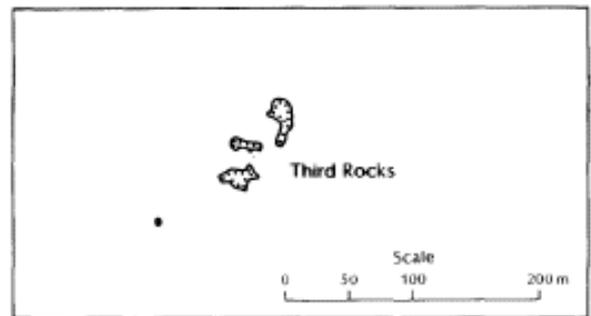
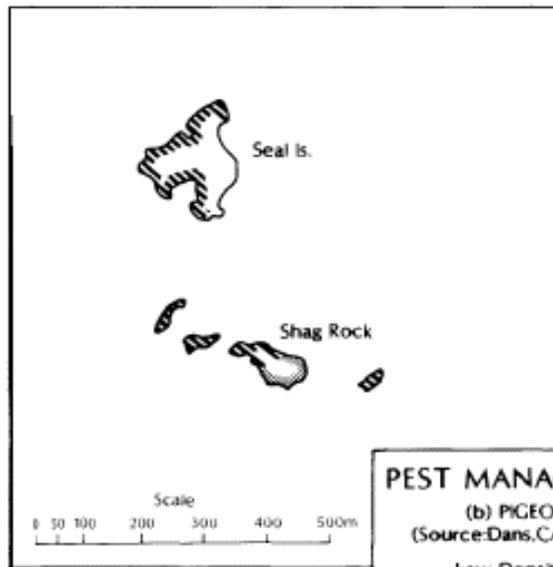
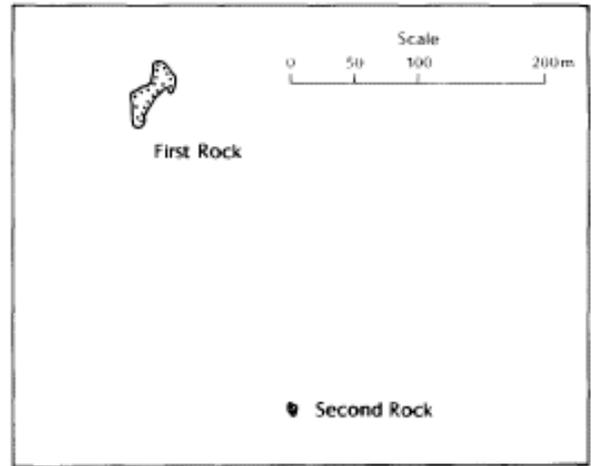
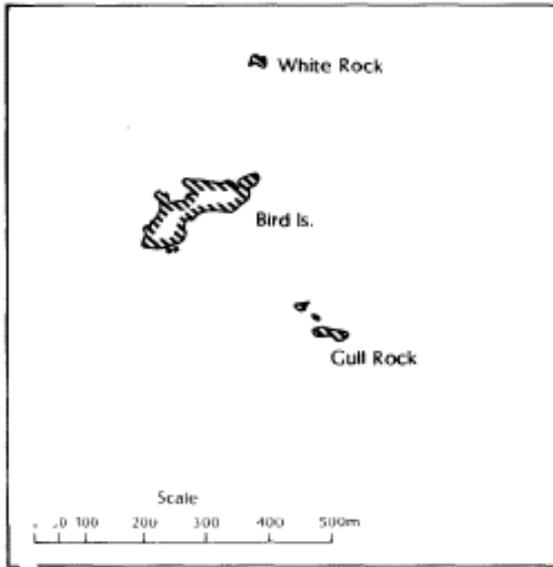


PEST MANAGEMENT - Fig 5(a)
 (a) SILVER GULL DISTRIBUTION
 (Sources: Dunlop et al. 1988 - Penguin Is.
 Dans CALM.pers.comm. 1990 - other Is.)

Low Density
 Medium Density
 High Density

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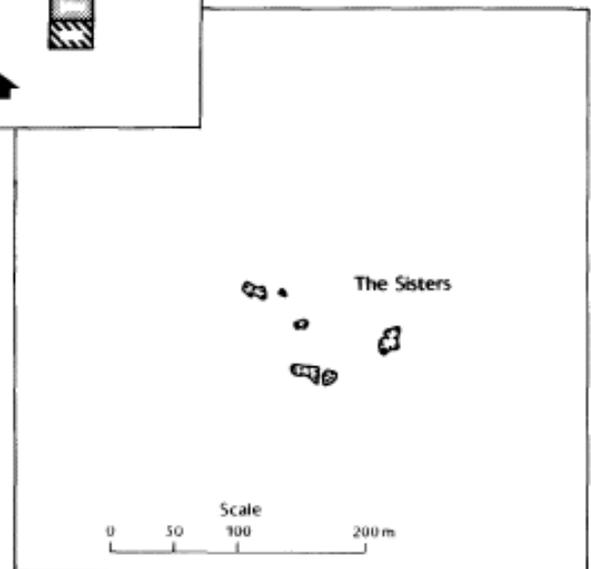
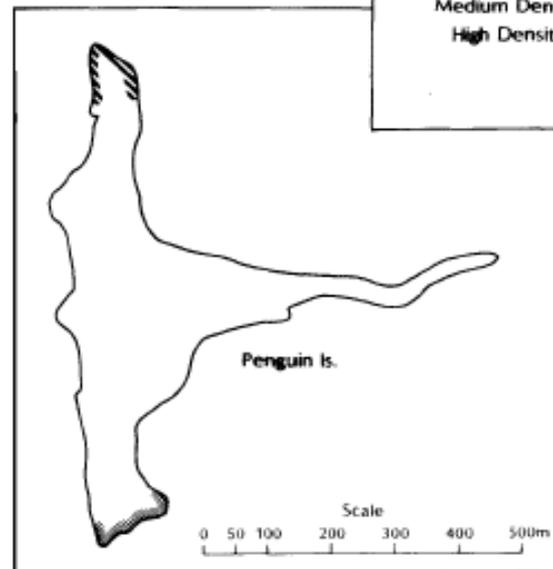




PEST MANAGEMENT-Fig 5(b)
 (b) PIGEON DISTRIBUTION
 (Source: Dans, CALM pers.comm. 1992)

Low Density 
 Medium Density 
 High Density 





15. FIRE

The objective is to protect people and the conservation and property values of the Shoalwater Islands from fire.

Fire on the Shoalwater Islands, particularly Penguin Island, could have a detrimental effect on some wildlife species and potentially threaten life and damage facilities. The major fire risk areas are those vegetated by *Acacia rostellifera*. The risk of fire, especially during summer months when the vegetation is driest, is of most concern. Frequent strong winds in the area would rapidly spread fire, giving sedentary species, such as Penguins and unfledged birds, little chance to escape. Once the vegetation is burnt there is either limited or no refuge for wildlife (depending on the extent of the fire).

Fire has not been recorded on the Islands. However, the occurrence of fire in the environment is a natural event and as *Acacia* is a species which regenerates after fire, there are likely to have been fires in the past. Until it can be shown that fire is necessary as a management tool, a no planned burn strategy is proposed for the period of the plan. Research into the relationship between fire and this type of environment is required, however this should not occur on these Islands.

Potential sources of fire include people lighting camp fires and inappropriate use of some types of barbecues. Owing to the risk and the nature of the recreational activity all fires, including all barbecues, will be excluded from the Islands. The recreational experience will focus on the natural attributes of the Island and not activities that are adequately catered for on the foreshore recreation reserves on the mainland.

ACTIONS

1. **Prohibit fires from the Islands for the period of this plan unless proven beneficial by research.**
2. **Develop a fire plan with strategies for fire prevention and suppression, including details of equipment, water storage, detection methods, and staff training and deployment.**
3. **Inform the public (on Penguin Island, Mersey Point and elsewhere)**
 - **that barbecues are not available or permitted on Penguin Island and the reasons for this.**
 - **that fires are prohibited (emphasise the reasons for this, especially the danger fire poses to the wildlife).**
 - **what actions should be taken for the safety or survival of visitors in the case of fire.**

16. MINING

The objective is to protect the Shoalwater Islands from mining.

Penguin Island is the only Island in the Shoalwater group to have experienced any form of mining activity. During the early part of this century, the southern plateau was scraped of phosphorus to provide fertilizer. These areas have since revegetated. Since then, no mining has occurred on any of the Islands.

Exploration and mining on the Shoalwater Islands are very unlikely to occur. Given the Islands' size, fragility of their ecosystem and conservation, recreation and other values, exploration and mining are unacceptable.

The Shoalwater Islands occur within a large area of land covered by the Alcoa Agreement Act (1961), 1 SA. Alcoa has lodged documents surrendering a portion of the lease which extends over most of the Swan Coastal Plain and includes the Shoalwater Islands (and also the Marine Park) with the Department of Mines. This involves legislative amendments.

Any applications for exploration and mining are subject to Environmental Impact Assessment in accordance with the Environmental Protection Act 1986, and current Government policy on mining in conservation reserves.

ACTION

- 1. Discourage exploration and mining.**

RECREATION

17. Principal Recreation Directions
18. Attractions and Existing Visitor Use
19. Penguin Island
 - 19.1 Access to Penguin Island
 - 19.2 Access on Penguin Island
 - 19.3 Interpretation/Recreation Area and Facilities
 - 19.4 Buildings
 - 19.5 Services
20. Access on Shoalwater Islands other than Penguin Island
21. Commercial Operations

17. PRINCIPAL RECREATION DIRECTIONS

RECREATION GOAL

Facilitate recreation in a manner compatible with conservation and other values.

OVERALL OBJECTIVES

1. Promote recreational experiences which are -
 - based on appreciation and understanding of the natural resources
 - non-disruptive and of a passive nature
 - a quality experience enhancing the visitor's enjoyment
 - different from those available elsewhere in the Region
2. Closely integrate recreation experiences with interpretation and education programs.
3. Ensure recreational use is compatible with protection and maintenance of the conservation values and consistent with (proposed) purpose and security of tenure.
4. Ensure use is equitable by not impairing other forms of use to an unreasonable extent.
5. Use opportunities to educate visitors about the important conservation values of the area.
6. Ensure recreation is in accordance with CALM policy on recreation, tourism and visitor services.

RECREATION STRATEGY

The strategy for recreation management is to encourage non-disruptive, passive use, reliant on the special environmental qualities of the Shoalwater Islands within the area zoned for recreation. Activities which result in conflict with wildlife and/or preferred activities will be discouraged or prohibited. The beach and recreation reserves on the mainland opposite the Shoalwater Islands offer many opportunities for a range of active recreational pursuits.

A plan for facilities has been developed for Penguin Island which includes a small picnic area and interpretation and penguin viewing facilities. Access on Penguin Island will be along raised boardwalks (above Penguin and Shearwater habitat on the tombolo area), upgraded and re-aligned walk trails and beaches.

18. **ATTRACTIONS AND EXISTING VISITOR USE**

The Shoalwater Islands are a popular recreation destination providing for a range of both water and land-based opportunities such as sightseeing, picnicking, exploring, surfing, swimming, fishing, boating, snorkelling and SCUBA diving. Natural features such as the wildlife, landscape, protected beaches and waters and the diversity of plants and animals on the intertidal platforms, reefs and seagrass beds attract visitors to the Islands. Other experiences in this environment include the adventure or novelty of being on an Island and social interaction among family and other groups.

Daytripping is recognized as being a part of the tourism industry. A day trip is defined as 'one which is taken for pleasure or recreational purposes, which lasts for at least four hours of daylight and which involves a round trip distance of at least 50km' (WA Tourism Commission, 1989). The Shoalwater Islands contribute to tourism through day tours in Rockingham; therefore, when referring to visitors throughout the plan one could interchange the term 'daytripper'.

Visitors can be divided into groups and include coach tourists, small groups of families and friends, education and community groups and the more active recreationists. The frequency of visits ranges from 'one-off' to regular, and length of stay from short duration to most of the day. The different requirements of visitors are considered when providing access and facilities, within the context of the future management directions.

Penguin Island, as a result of its size, diversity of attractions and ease of access, is the primary recreation area. Seal Island, with its small beach, has been used to a much lesser degree while the other Islands receive few visits as they are rocky and have no beaches enabling landing. However, although some land areas may be infrequently visited their surrounding waters are very popular.

It is estimated that 50 000 to 70 000 people visit Penguin Island yearly with approximately 3 000 people visiting on the busiest days (G. Pobar, pers. comm. 1989). Since 1987, Penguin Island has been day-use only. People gain access to the Island mainly by wading across the sandbar, by ferry, and, for a small number, by private boat.

The tombolo area of Penguin Island receives greatest use, particularly the beach on its north edge and the grassed area. The western beaches with associated surfing areas are also popular. All of the Island's beaches are used. The highest levels of use occur during weekends and holiday periods.

Overcrowding on Penguin and Seal Islands often results in conflicts between visitors and wildlife. Overcrowding has both an environmental impact, whereby the natural ecosystem is detrimentally affected, and a social impact³, whereby the quality of the visitors' experience is marred.

3. The numbers at which there is a social impact on a visitor will vary according to individual expectations

With the previous and existing types and levels of use (and management) the conservation values of some of the Shoalwater Islands has been compromised. For example, the building of numerous structures on Penguin Island has substantially disturbed the natural environment, and on Seal Island, Sea-lions are competing with people for limited beach space.

CALM is well advanced in the removal of unused buildings on Penguin Island. Because the Penguins nest under and close to buildings the work must be staged to minimise disturbance.

Given existing and expected increased use of the general area, rationalisation of the types and level of future use of the Shoalwater Islands was essential.

Climatic influences have an impact on visitor use as follows:

- Owing to their location, the Islands are strongly influenced by wind, waves and tide, all of which affect daily and seasonal patterns of visitor use. Other climatic factors such as temperature and rainfall are also significant.
- Prevailing winds during winter are mainly westerlies with north-west gales. During the peak use period in summer, predominant winds are south-westerly sea breezes in the afternoon with easterly land breezes overnight and in the morning. The eastern foreshore and waters of the Islands offer protection from the frequently strong sea breezes, providing protection for visitors regardless of wind direction.
- The tidal range, although small, is a significant factor when crossing to Penguin Island by the sand bar. The tidal range is influenced by meteorological effects such as winds. In summer the sand bar may be easy to cross in the morning but is deeper and flows faster in the afternoon, often making conditions potentially dangerous.
- Breezes from the ocean result in cooler and more pleasant temperatures in summer on the Islands than on the mainland.
- Seasonal variations influence the width of the beach and also the configuration of the shoreline.

19. PENGUIN ISLAND

19.1 ACCESS TO PENGUIN ISLAND

The objective is to encourage safe access for all visitors.

Penguin Island is the most readily accessible of the Shoalwater Islands. Access occurs via wading across the sand bar, ferry from Mersey Point and private boat.

The sandbar to Penguin Island is partially to completely submerged and unstable. CALM has management jurisdiction of the sand bar as it is located in the Shoalwater Islands Marine Park.

Several people have lost their lives crossing the sandbar. Conditions change during the day. It may be fairly safe to cross the sand bar in the morning but unsafe in the afternoon due to the sea breeze, a rise in the water level and a strong rip through the channels. It is common for people to require assistance from the water. School groups also use the sandbar and their safety is of concern.

While acknowledging the danger, walking across the sandbar may be considered part of the Penguin Island experience by some visitors. Many other natural areas may be hazardous to visitors engaging in certain activities. Visitors should be informed at Mersey Point of the potential dangers. Once warned, visitors must be responsible for their own actions.

The continuation of access across the sandbar will be reviewed when a management plan is prepared for the Marine Park.

The ferry service from Mersey Point to Penguin Island has been operating over a long period under contract from CALM. For safety reasons it is desirable that the ferry is used. Also commentary on the ferry can be given to promote the Island's features and to guide visitors. Many visitors who gain access to the Island by the sandbar rely on the ferry to return them to the mainland. This can then overload this service when it attempts to return large numbers of visitors to the mainland.

Access for disabled people will be provided where possible when considering access and facilities to, and on, Penguin Island.

Visits to the island by private boat are minimal compared to other means of access. The shallow seagrass beds on the eastern side, and reef platforms and surf surrounding the rest of the Island make boat landings difficult. The deepest water is at the approach to the jetty. No specified anchorage or

landing area exist which may result in damage to seagrass beds and/or conflict between boat users and people on the beach and in the water. Restrictions, therefore, must be applied.

A need exists to allocate and mark a preferred access route in the shallow waters and anchoring and landing areas. Some craft, including those with propellers, will be prohibited from some other areas surrounding the Island, including non-allocated routes/areas in the shallow waters. This is particularly important as it is anticipated that there will be an increase in private boat owners visiting the Island. Liaison with the Department of Marine and Harbours is required and the necessary licence s/approvals sought. This will be an interim measure until there is a management plan in place for the Marine Park.

Penguin Island is closed for the peak laying period of the Little Penguin which generally coincides with inclement weather conditions (around the winter months). The Island may also be closed for other necessary reasons such as work programs. Storms often prevent access to the Island.

Closure may need to be extended, or access to specific sites restricted, depending on the nature of the laying period (for example, two peaks may occur). Interpretive tours with CALM approved guides may be given access when the Island is closed to the public. This will be subject to the impact such tours may have on wildlife and the availability of resources. Such visits will need to be closely supervised and additional charges will be imposed.

Liaison with the Department of Marine and Harbours is required in regard to issues such as the ferry service, jetty and placing navigation markers in the Marine Park.

Predicting the future numbers of visitors to Penguin Island is difficult as are the impacts of large numbers of visitors on the natural environment and the visitor experience. Visitor numbers will continue to be monitored. Restrictions, such as limiting the number of visitors on Penguin Island, may be necessary on peak use days.

ACTIONS

- 1. Continue the ferry service to an agreed schedule (see Section 21) and encourage its use.**
- 2. Ensure the ferry operator continues to provide interpretive and educational information through commentary on the ferry trip. Liaise with the operator on a regular basis, to update information. Assist with training where possible.**

3. **Use signs and other media to warn of the risks of crossing to Penguin Island by the sandbar. Initiate an education program to inform the community of the dangers. Review sandbar access in the Marine Park management plan.**
4. **Continue to maintain the Penguin Island jetty. Consider erecting a shelter on the jetty, that would be aesthetically acceptable.**
5. **Liaise with the Department of Marine and Harbours to delineate a preferred access route through the shallow waters to Penguin Island, and allocate anchoring and landing areas for small vessels. This would be an interim measure until a management plan for the marine park is produced. Actively encourage use of these areas.**
6. **Continue to close Penguin Island during the Penguin peak laying period or for other necessary reasons (for example, work programs) as required by CALM's Executive Director (or his delegate). Liaise with researchers. Further restrict access when necessary. Allow controlled access for interpretive tours with CALM-approved guides, subject to the impact on wildlife and availability of resources. Notify the public of closure and re-opening of Penguin Island and interpretive tour opportunities.**
7. **Provide access to Penguin Island for disabled people where possible.**
8. **Continue to monitor visitor use. Impose restrictions, such as limiting the numbers of people on the Island during peak periods if required.**

19.2 ACCESS ON PENGUIN ISLAND

The objective is to provide access for visitors' enjoyment of Penguin Island while ensuring that the Island's values are not adversely affected.

Existing access on Penguin Island (Figure 6a) consists of:

- two fenced walk trails from the eastern side of the Island to the western beach. Both have small sidetracks to high points leading to a lookout (south) and bird hide (north)
- unguided and guided access on the tombolo area
- beach access.

Guiding access along the two walk trails instead of allowing unrestricted access over the Island has directly assisted in the control of erosion, enabled vegetation to regenerate and protected fauna from disturbance. The northern walk trail is well located. However, the southern walk trail requires re-alignment to improve the circulation of visitors and ensure visitors are directed to the interpretation facility as their first destination on the Island. Both walk trails have sidetracks to high vantage points offering excellent views of the Island and beyond. The two structures at these points are visually obtrusive and should be redesigned and relocated while ensuring that views are retained.

The trails have been fenced to stop people wandering from them. The height of the fencing is generally well above the low-lying vegetation and is, therefore, visually obtrusive. Furthermore, fencing is used by roosting Silver Gulls and their excrement makes use of the rails undesirable.

It is difficult to walk on the slatted path on steep slopes due to erosion under the slats. An improved surface that needs minimum maintenance is required and the fences need lowering to minimise the fences affect on the landscape.

Existing access throughout the tombolo is not well defined or directed. This situation is exacerbated by the different stages of building removal. Some fencing has been erected to protect Penguin habitat and rehabilitation areas and to prevent access to buildings. The fencing is a temporary measure. The primary concern on the tombolo is to protect Penguins, Little Shearwaters, other fauna and their habitat.

Fencing along beach vegetation margins generally has effectively guided people to walk trails and inhibited access to protected areas. Owing to the continual process of sand accretion and erosion, fences often require maintenance.

The caves, talus slopes and other features are accessible to visitors. These features indicate continued weathering. The limestone formations collapse frequently. The new falls, although obvious, do not deter the many day visitors who use the caves, particularly those caves adjacent to beaches. Access to caves is also discussed in Section 22, Information, Interpretation and Education.

Specific areas have been, and will continue to be, closed for reasons of wildlife protection and visitor safety if required.

STRATEGY

The access and facility concept plan developed for Penguin Island provides visitors with opportunity to view and appreciate the Islands wildlife and other values and gives greater direction to visitor's activities while protecting these values (Figure 6b).

Access on the Island is by boardwalks on the tombolo area, two east-west walk trails and along beaches. Boardwalks and also steps will be used to protect important fauna habitat. The southern walk trail will be re-aligned. Access elsewhere is prohibited except by permit or with a CALM - approved guide.

The boardwalk from the ferry guides visitors to the interpretation/management facility and from there other access routes guide visitors to a range of experiences, such as viewing different vegetation types and physical features, and observing fauna.

The specific location of access routes is subject to a site development plan, including survey, with the access and facility concept plan used as a guide (Figure 6b). This flexibility is necessary to ensure minimal disturbance to fauna and their habitat when the more detailed phase is implemented.

ACTIONS

- 1. Develop access according to the Penguin Island access and facility plan (Figure 6b) and zoning scheme (Figure 2).**
- 2. Ensure accessways are carefully located and designed, especially the southern walktrail re-alignment and the boardwalks in the tombolo area. Investigate the most suitable height for the boardwalk. Incorporate small platforms along the boardwalk to allow groups to gather without inhibiting other visitors.**
- 3. Provide for disabled access on the Island where possible, for example, wheelchair access on the boardwalk. Promote these facilities.**
- 4. Install fencing along the edge of the beach to protect, where necessary, vegetation.**
- 5. Upgrade the surface of the walktrails.**
- 6. Minimise the visual impact of fencing. Lower existing fencing along the walk trails or seek an alternative once the walk trails are upgraded. Provide support rails where essential (for example, for safety reasons).**

- 7. Relocate and redesign the two hilltop structures so that they are not visually obtrusive.**
- 8. Alert the public to potential safety hazards, including those associated with cave use, via signs and other media.**
- 9. Provide shelters and encourage their use as an alternative to using caves (for shelter).**
- 10. Prohibit access to specific areas for wildlife conservation and safety reasons, if needed.**

Figure 6(a)

PENGUIN ISLAND - EXISTING ACCESS AND FACILITIES

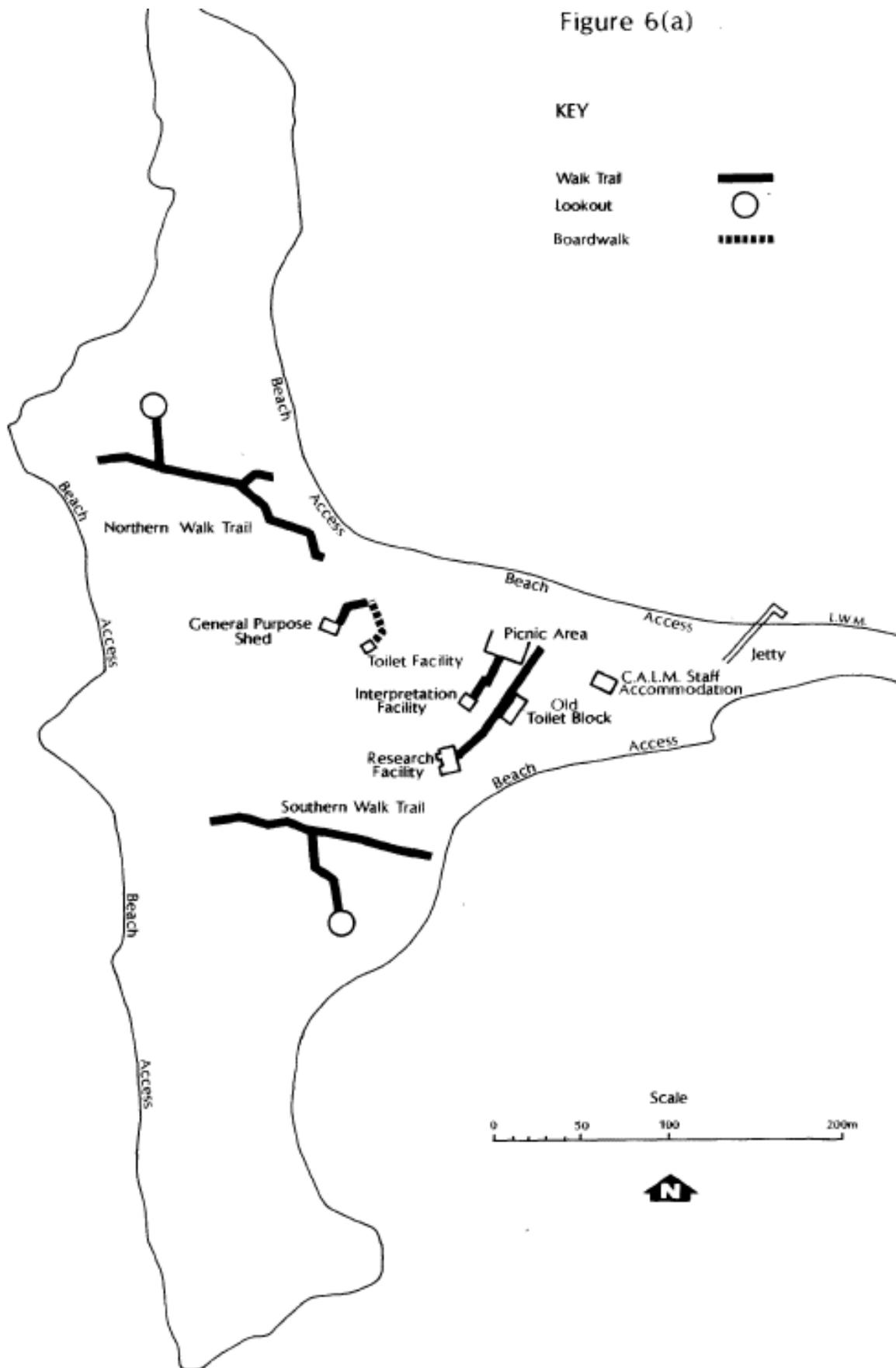
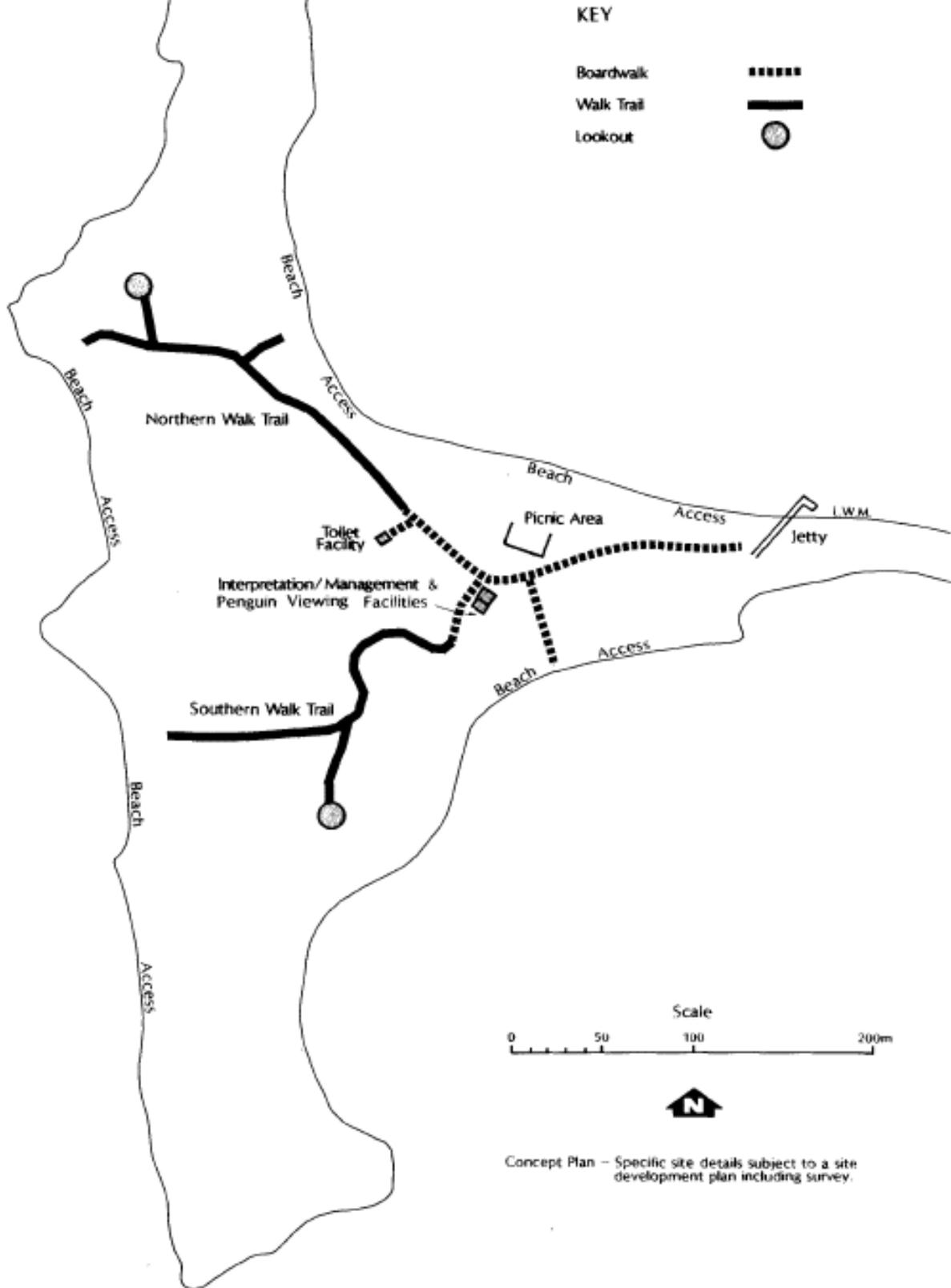


Figure 6(b)

PENGUIN ISLAND - ACCESS AND FACILITIES CONCEPT

Figure 6(b)



19.3 INTERPRETATION / RECREATION AREA AND FACILITIES

The objectives are to:

Develop a central recreation area as the focal point for visitors.

Provide essential facilities that are simple, durable and remain compatible yet subordinate to the environment and can cater for the average peak period of use.

Before the private lease was purchased all facilities were the responsibility of the lessee. Since then extensive maintenance has been carried out on these facilities. However, due to their age and condition, they are not of a satisfactory standard and require upgrading.

The major facilities to be provided on Penguin Island are an interpretation/management facility, a Penguin viewing facility and a small, grassed picnic area (Figure 6b). New toilets have been constructed to replace old ones which had a leaking septic system. Facilities are linked by boardwalks, beach access and/or walk trails (see Section 19.2 Access on Penguin Island). Two lookouts located on the northern and southern walk trail will be relocated and upgraded. All buildings built by the former lessees will be removed (see Section 19.4, Buildings).

A mobile facility could be provided on Penguin Island to distribute basic refreshments to visitors, as a commercial operation. This may be linked to the proposed Mersey Point kiosk, subject to negotiation with the City of Rockingham, ferry lease or another concession (see section 21 for the regulation of commercial operations). Methods that can be used to provide the mobile facility need to be investigated, but a boat would probably be most suitable. No infrastructure would be allowed on Penguin Island, and the service could be discontinued if there were insufficient demand.

Little shelter is currently available for visitors, although the few shelters provided are very popular. Owing to their location some of these shelters on the western beach are vulnerable to storm activity. Visitors often seek shelter in caves.

Litter bins are located along the north-eastern foreshore of the tombolo area. Staff pick up litter and empty bins which are filled rapidly on days the Island has many visitors. Rubbish is ferried to the mainland.

Drinking water is provided by a pipe from the mainland.

The City of Rockingham is establishing a visitor facility, incorporating an interpretation centre, kiosk and toilets, on Mersey Point, opposite Penguin Island. This will service visitors to the Shoalwater Islands, the Marine Park and the City of Rockingham area in general. CALM is liaising with the City

of Rockingham to facilitate development of Mersey Point complementary to the facilities provided on Penguin Island.

It is essential that visitors are advised of the facilities provided on Penguin Island.

Unsuitable Facilities

Some facilities, including a kiosk and barbecues, were provided by the previous managers of Penguin Island. A kiosk will not be provided owing to the infrastructure that would be needed and the future location of a kiosk on Mersey Point.

Barbecues were provided or allowed on Penguin Island. However, all barbecues will be prohibited as this is not the type of recreation experience that will be encouraged on the Island. Some types of barbecues also increase the risk of fire escaping. Barbecues are available on the mainland (see Section 15, Fire).

STRATEGY

The interpretation/recreation area will be the focal point for visitors and will include interpretation/management and Penguin viewing facilities and a picnic area. On arriving on the Island visitors will be guided from the jetty along a boardwalk to the interpretation/management facility and from thereto other parts of the Island.

ACTIONS

- 1. Construct an interpretation/management facility.**
- 2. Construct a penguin viewing facility, determining the best design and location by trial.**
- 3. Establish an informal picnic area including seating and shelter. Install barriers along boundaries to protect bird habitat.**
- 4. Allow for a private concession to provide a mobile facility on Penguin Island to distribute basic refreshments to visitors. In conjunction with potential operators, investigate the most suitable method that can be used.**
- 5. Review the provision of litter bins on Penguin Island once major works have been completed. Provide a minimum of litter bins, preferably only in the interpretation/ recreation area, and actively encourage their use. Encourage visitors to take their litter home.**

6. **Rehabilitate vegetation where necessary. For example, to the edge of the picnic area and around the interpretation/management facility.**
7. **Advise visitors, by the use of signs and other media, of the facilities available on Penguin Island.**

19.4 BUILDINGS

The objective is to remove all lessee-constructed buildings.

Small houses/cottages were built by the former lessees of Penguin Island and used predominantly by them and their families. Some were also rented to other visitors. In mid1987 CALM took over management. Since then nobody has stayed overnight on Penguin Island except for CALM approved researchers and CALM officers working on the Islands.

Unauthorised overnight stays on Penguin Island are not acceptable given its conservation value and conflicts of use. Overnight use has adverse effects on Penguins, other sea-birds, and the fragile Island ecosystem. Additionally, it is an inequitable use of a public resource. All of the buildings on the Island constructed by the lessee are in poor condition, have a negative visual impact on the landscape, and some are located precariously close to the foreshore.

At present, lessee constructed buildings are temporarily used as:

- an interpretation facility
- a general purpose shed
- a CALM staff residence
- a research house.

In addition, a new toilet facility has been built by CALM according to the facility plan. This was essential owing to leakage from the septic system from the lessee built toilets. The new toilets are self contained (composting) and wheelchair accessible. The old toilet block will be removed.

A building has been altered to serve as a temporary interpretation facility, until a new facility for interpretation and management purposes is constructed. The temporary centre will then be removed.

A building is used as a residence by CALM staff working on the Shoalwater Islands and Marine Park. A permanent residence on the mainland will be sought and accommodation suitable for overnight use will be incorporated into the interpretation/management facility on Penguin Island

(Figure 6b). The building now being used for accommodation will then be removed. CALM's future presence on Penguin Island will be mainly day-time (see Section 25, Priorities, Funding and Staff).

A building is currently used by researchers who hold permits from CALM. Valuable information is provided by these people which has aided management of the Islands (see Section 24, Research and Monitoring). It is desirable that overnight accommodation be available for use by researchers. This will be integrated with CALM staff accommodation in the new interpretation/management facility (Figure 6b), and the existing research building will then be removed.

A general purpose shed houses the generator and maintenance equipment and is used as a workshop. The shed will be required until major work is completed. A storage area will be incorporated in the interpretation/management facility for essential equipment.

Demolition of buildings is constrained by lack of resources, particularly given the high cost of moving materials across water. Furthermore, in order to minimise disturbance to Penguins, work must be carried out in stages and at certain times of the year. Demolition must be undertaken very carefully as Penguins nest under buildings and occupy adjacent vegetation. Unfortunately, during this lengthy process the Island looks untidy.

When some buildings were demolished the flooring was temporarily retained as Penguins' nesting sites. Revegetation on these sites takes time. Artificial nesting sites have been constructed. Klomp (1987) has suggested that the high percentage of occupation of artificial nests by the Little Penguin may be directly related to the available habitat and the size of the colony.

Overnight stays are not permitted on other Islands/Rocks.

ACTIONS

1. Remove buildings and construct new facilities in accordance with the access and facilities plan (Figure 6b).

This includes;

- Removing the unused toilet block.**
- Removing the temporary Interpretation Facility when the new interpretation/management facility is in use.**
- Removing the general purpose shed once the major work is completed.**
- Transferring the generator and maintenance equipment to the interpretation/management facility.**

- **Removing the CALM staff residence when mainland accommodation is available and the new interpretation/management facility is in use. A ranger's public contact point will also be incorporated into the new building.**
 - **Removing the research building when the new interpretation/management facility is in use.**
2. **Rehabilitate sites as buildings are removed. During all works minimise disturbance to flora and fauna, particularly Little Penguins and Little Shearwaters.**
 3. **Ensure a CALM officer familiar with Penguins, Shearwater and other species on Penguin Island is on site when buildings are removed to ensure disturbance to species is minimised, and to oversee possible relocation of birds and positioning of artificial nests. Work should preferably occur when fauna activity is lowest.**
 4. **Ensure people remaining overnight on Penguin Island are authorised by CALM. Authorisation is only to be granted to CALM staff working on the Shoalwater Islands and researchers with permits.**
 5. **Remove as many structures associated with buildings, such as fencing, as possible. If they have become overgrown with vegetation and are providing a nesting habitat consider leaving structures in place.**

19.5 SERVICES

The objective is to maintain essential services to/on Penguin Island by the most cost effective method and provide for future requirements.

Providing services to Penguin Island is complicated by service delivery across water. Power on Penguin Island is supplied by a generator which is stored in a large aesthetically unattractive shed which is also used for storage. The shed is needed until the major work involved in implementing the site development plan is completed, after which the shed, and an unused generator and other unnecessary equipment will be removed. The storage area for the generators and other equipment will be incorporated in the interpretation/management facility.

Gas cylinders are transported to the Island to fuel heating and cooking facilities for CALM staff and researchers.

Water is provided on the Island via an underground pipeline from the Water Authority meter at Mersey Point. This pipe is often uncovered because of shifting sand and in some locations, particularly near the jetties, it floats to the surface and is often damaged by anchors and boat propellers.

Water tanks storing mainland water were removed from the dunes abutting the tombolo area and this site requires rehabilitation. The bore used to water lawns has gone brackish and will be removed.

A telephone line provides an important communication link between Penguin Island and the mainland.

ACTIONS

- 1. Remove the general purpose shed and unnecessary equipment on completion of major work. Provide a storage area in the interpretation/management facility.**
- 2. Investigate the use of an alternative power source to the generator while considering the impact of other sources of power on the Island's values.**
- 3. Maintain the existing water pipe and improve its security in the short term. Consider relocation and upgrading of the water pipe in the longer term.**
- 4. Remove the bore pump, cap the bore and rehabilitate this site Rehabilitate the site from where the water tanks were removed.**
- 5. Maintain communication links between the mainland and Penguin Island for use by CALM staff and for others in emergencies.**

20. ACCESS ONTO THE SHOALWATER ISLANDS/ROCKS OTHER THAN PENGUIN ISLAND

The objective is to protect the natural values of these Islands/Rocks from adverse impacts of visitor use.

Seal Island has protected waters and a beach, enabling small craft to land. The beach is an important Sea-lion resting place and the remainder of the Island is a significant bird breeding area. Conflict

occurs between people and wildlife on Seal Island. The small beach area on Seal Island is a resting site for up to 35 Sea-lions. Conflict occurs between the animals and visitors because:

- boats take up the limited beach space
- people use the beach for sports such as cricket and volleyball
- people interfere with Sea-lions to make them move
- animals are speared and shot
- people hand-feeding the animals which leads to approaches to boats for fish.

Visitor safety is also of major concern as there have been incidences of people being bitten. Although the Sea-lions appear docile when dozing on the beach, they are wild animals and are capable of rapid movement and could cause severe injury to visitors.

Visitors also disturb the seabirds on Seal Island which is a concern during the breeding season. There have been incidences of people smashing eggs and committing other offences (G Pobar, pers. comm. CALM 1992). Part of the Island has been fenced and signposted to stop access, with some success. However, in other areas, such as the southern high point, which is a nesting area for Crested and Caspian Terns, control of access by signs has been unsuccessful. It is very difficult to control people's movements once they are on this small Island.

The recreational activities on Seal Island can be readily pursued elsewhere and are generally not reliant on the Island's special character. Furthermore, use of Seal Island appears to be increasing, thus promoting further harassment of Sea-lions and disturbance of sea-birds and risks to visitor safety. Observation of the Sea-lions is a major attraction and can be achieved by methods, other than by landing on the beach, which minimise disturbance to Sea-lions.

Access to Shag Rock, Gull Rock, White Rock, Bird Island, The Sisters, Third Rocks, First Rock, Second Rock and Passage Rock is naturally restricted due to difficulty in landing boats and thus visits to them are infrequent. However, when these Islands are visited the sea-bird colonies are disturbed, especially as the Islands are small. Problems of disturbance of seabirds similar to those on Seal Island also occur on the other Islands.

The best means of ensuring the long-term protection of wildlife and safety of visitors on these Islands is to prohibit access onto them.

STRATEGY

Long-term protection of the conservation values on Seal Island, particularly the Sea-lions, which are gazetted as in need to special protection, is best ensured by excluding access to Seal Island except by permit.

Opportunities exist to observe the Sea-lions without landing on the beach. The area of water adjacent to the beach is to be kept free of boats (and people) to act as a buffer for the wildlife on the beach. The best size for the buffer area is to be determined by trial. Consideration will be given to a limited number of guided interpretive tours of Seal Island by CALM staff or CALM approved persons. Guidelines for watching Sea-lions are to be prepared.

Access to Shag Rock, Gull Rock, Bird Island, White Rock, The Sisters, Third Rocks, First Rock, Second Rock and Passage Rock is very difficult due to their rocky nature. Protection of the conservation values of these Islands is also best ensured by excluding public access to them, except by permit.

All Islands/Rocks are to be given special conservation zoning (refer to Section 6, Zoning).

ACTIONS

- 1. Prohibit public access onto Seal Island, Bird Island, Gull Rock, Shag Rock, White Rock, The Sisters, Third Rocks, First Rock, Second Rock and Passage Rock.**
- 2. Consider interpretive tours of Seal Island under the leadership of CALM staff or approved persons. Allow access to prohibited areas for research purposes via written permit or under the supervision of CALM approved persons. Establish stringent conditions for visiting, including limits on number of visits per year and group size.**
- 3. Install marker buoys off Seal Island to delineate a buffer area of water within which boats (and people) must not encroach. Determine the most suitable size of the buffer area through trial, initially trial a distance of approximately 10 metres seaward of the low water mark of Seal Island. Liaise with the Department of Marine and Harbours.**
- 4. Establish guidelines for watching the Sea-lions.**
- 5. Initiate an education program to inform the public of prohibited access areas and to direct people to Penguin Island or elsewhere. Outline reasons for closing the Islands.**
- 6. Liaise with the Fisheries Department and Marine and Harbours to ensure recreation activities around the Islands do not adversely affect the conservation values of the land and**

marine environments as an interim measure until a management plan is in place for the marine park.

- 7. Ensure there are regular patrols of the Islands by CALM officers, particularly when they are first closed, when wildlife require most protection and during peak visitor use. Enforce access restrictions when necessary.**

21. COMMERCIAL OPERATIONS

The objectives are to:

Ensure commercial operators promote an appreciation of the natural environment and complement CALM's interpretation programs.

Ensure that any commercial operations allowed on Penguin Island do not

- adversely affect the environment**
- increase visitor pressure on the land to an unreasonable extent**
- detract from the reasonable enjoyment of the land by the public.**

Ensure that commercial operations on Penguin Island are compatible with planned future operations in the Marine Park.

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 of the NPNCA and the Minister for the Environment. Concessions must be consistent with the purpose of the reserve and the protection of its values and management plans if in place.

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. However, CALM is likely to undertake those commercial activities which are environmentally or socially sensitive or are of important educative or interpretive value to visitors.

Currently one commercial venture operates in Shoalwater Bay. The operator provides the ferry service between Mersey Point and Penguin Island and offers tours of Shoalwater Bay. The tours land on Penguin Island but observe other Islands from the boat. There may be further concession proposals for the Islands and surrounding waters, particularly given the status 'of the Marine Park. These will be considered on a case-by-case basis. It must be recognised that the natural environment, particularly the Island environment, has a limited ability to sustain large numbers of visitors. However, potential exists for tour use of Penguin Island during the week as most people visit on weekends and public holidays.

A tourism and marketing study of the Shoalwater Bay Islands has been conducted (Australian Groundwater Consultants, 1989). This report examined the way in which tourism values could be developed and enhanced, while at the same time conserving the natural and cultural features of the Islands on which the tourism values depend. The study recognised that public contact and interaction with wildlife in its natural environment is a rapidly growing area of tourism. However, it also emphasised the need for expansion to be consistent with the capacity of the resource, management

objectives and the infrastructure to cope with the pressure. Specific recommendations proposed in the report were considered in the preparation of this document. In general their recommendations are supportive of those in this document.

ACTIONS

- 1. Establish and manage all commercial operations in accordance with CALM policy. The most pertinent issues are:**
 - **concessions are allowed only if they are consistent with the purpose of the reserve.**
 - **CALM undertakes those commercial activities which are environmentally or socially sensitive, or are of important educative or interpretive value to visitors.**
- 2. Review concessions upon the expiration of leases/licenses/permits.**
- 3. Establish conditions for commercial concessions. If conditions are not met by the concession holder then the concession may be terminated.**
- 4. Maintain close liaison between CALM and commercial operators and monitor the impact of the commercial activities.**
- 5. Ensure all commercial operators are sympathetic to CALM's management objectives and concerns for the Shoalwater Islands.**
- 6. Liaise with the City of Rockingham, Western Australian Tourism Commission and other bodies to ensure tourism proposals are in keeping with the management objectives for the Islands (and surrounding waters); that is, they are not detrimental to the values on which tourism depends.**
- 7. Provide training and support for CALM staff in dealing with commercial operations and their requirements.**
- 8. Liaise regularly with the WA Tourism Commission and commercial operators concerning events and proposed changes on the Islands. Organise forums, if needed, to discuss any issues or problems that may be occurring.**
- 9. Encourage mid-week and off peak tours of Penguin Island.**

INFORMATION, INTERPRETATION AND EDUCATION

22. Information, Interpretation and Education

23. Community Liaison and Volunteer Involvement

22. INFORMATION, INTERPRETATION AND EDUCATION

INFORMATION, INTERPRETATION AND EDUCATION GOAL

Promote an informed appreciation of natural and cultural values.

OBJECTIVES

Provide interpretation of the Islands in accordance with the Regional Interpretation Plan. Ensure information is integrated with, and complementary to, that already provided and that planned to be provided regionally and locally (in particular Cape Peron and Mersey Point).

Develop and maintain an information and education program for both the local and broader communities conveying the Islands values as conservation reserves as well as the associated management concerns.

Encourage the use of Penguin Island for educational purposes, and as a vehicle for broader education about the marine environment.

Increase visitors' awareness and appreciation of the Islands' natural and historical values through information, interpretation and education. Encourage caring and conserving behaviour.

An effective information, interpretation and education program is an essential component of management. This informs the public of the attractions, facilities and opportunities available and provides an avenue for appreciation and greater understanding of the natural environment. At the same time it fosters appropriate behaviour so that impacts on the environment are minimised. In the past, the major use of the Islands has been for active forms of recreation concentrated on Penguin Island in the summer months. Limited interpretation has been offered apart from basic signs. Future uses that will be encouraged are those reliant on the special qualities of the natural environment.

Since CALM began to manage the Islands, information, interpretation and education has figured prominently in the management and planning, both for Shoalwater Islands and the surrounding areas.

In the marine and Island environments, interpretation has also been planned and/or provided at Marmion Marine Park, Garden Island, Carnac Island and Mersey Point. Information provided at and for Penguin Island, therefore, has to be integrated with and built upon this other information.

The Regional Interpretation Plan (in preparation) identifies local wildlife, the geology and local social history as the key features to be interpreted on Penguin Island. These interpretive stories complement those planned elsewhere and are specific to the Island's ecosystems.

More general information about Shoalwater Islands is proposed for Mersey Point, in liaison with the City of Rockingham.

Already there has been a significant commitment to information, interpretation and education by both CALM staff and volunteers. They are presently run from a building on Penguin Island which has been converted into a temporary interpretation facility. A new facility is required. Regular patrols by CALM staff ensure a high level of contact with visitors. Some formal guided tours have been organised and conducted by volunteers, concentrating on the peak periods during summer (see Section 23, Community Liaison and Volunteer Involvement). The new facility will provide a public contact point for CALM staff and volunteers.

School and community groups have been, and will continue to be, the source of a heavy demand for educational activities and talks on the Island. A University Extension Course has also been successfully run.

Tourism

Interaction with wildlife in its natural environment is a growing area of tourism, and the proximity of Shoalwater Islands and the Marine Park to Perth make them an attractive visitor destination.

When referring to visitors this term could be interchanged with daytrippers (see Section 18, Attractions and Existing Visitor Use). Daytrippers include visitors from the local community, metropolitan area, intrastate, interstate and overseas. The requirements of different types of visitors will be considered when developing facilities and in the provision of information, interpretation and education in liaison with the WA Tourism Commission. The City of Rockingham, recognising the tourism potential of the adjacent natural environment, is promoting their municipality as an 'aquatic playground'.

In a tourism and marketing study of the Shoalwater Bay Islands the key was considered to be an effective education and interpretation program that includes on-the-ground facilities as well as an ongoing, co-operative program with private industry and the community. It was recommended that all tourist activities on the Shoalwater Bay Islands should be developed in a way that promotes the wildlife values of the reserves.

Signs

Effective signs provide a positive link between CALM, the visitor and the environment and are a key form of communication. They are an integral part of the overall management of the Shoalwater Islands. Signs enable visitors to become orientated, be aware of the opportunities available and have a greater understanding of the Islands' environment. Signs are also important mechanisms to advise visitors of the restrictions on the Islands and the 'reasons for these restrictions. Signs should be non-intrusive and readily understood.

Signs on the Shoalwater Islands vary in their effectiveness. Furthermore, with the changes detailed in this management plan an overall sign plan is needed to clearly inform people of new management directions and to rationalise the need for, and the quality of, existing signs.

Mersey Point is an important contact site providing initial impressions before visiting Penguin Island. Signs in this area should be integrated within the sign plan for the Islands.

Signs at other locations on the mainland should also be considered, such as at boat ramps, Cape Peron and Port Kennedy.

Penguin Viewing

(i) Day-time viewing

Allowing visitors the opportunity to view Penguins is considered an important component of visitor management. Penguins should be viewed in as 'wild' a state, and on as regular a basis as possible. Trials will need to be conducted to determine the most suitable viewing facility, that is, one which minimises detrimental impacts on Penguins and provides visitors with a worthwhile experience. When locating and designing this facility the biology of the Little Penguin will be carefully considered. Fees will be imposed.

There have been proposals for viewing a captive group of Penguins in a marine enclosure, possibly on Penguin Island. The viability of this proposal has not been researched but keeping a captive group on Penguin Island is not generally considered appropriate. However it may be possible to view Penguins recuperating in enclosures on the Island.

(ii) Night-time viewing

Although 'Penguin Parades' have been successfully promoted and marketed on Phillip Island in Victoria, a similar scheme, with large crowds and infrastructure including lighting, is not suitable for Penguin Island. Uncontrolled and large scale viewing of nocturnal Penguin landings would be too

intrusive and disruptive to the birds to be acceptable and is not a feasible means of viewing Penguins⁴.

Opportunities exist, however, for limited nocturnal viewing of Penguins under CALM supervision and subject to stringent conditions. This will be trialled and discontinued if detrimental to the Penguins.

ACTIONS

- 1. Continue to liaise with the City of Rockingham with respect to the development of a visitor facility at Mersey Point (see Section 5). Information supplied should introduce the Shoalwater Islands area and invite further exploration.**
- 2. Provide a new interpretation/management facility on Penguin Island. Information provided should be in accordance with the Regional Interpretation Plan and encourage awareness, appreciation, and understanding of the Islands special qualities and promote environmentally friendly behaviour.**
- 3. Provide signposted, interpretive walks on Penguin Island that are guided and self-guided. All are to emanate from the interpretation facility.**
- 4. Provide a means of viewing Penguins during the day-time, determining the best design and location by trial. Impose fees. Allow limited nocturnal viewing, under strict CALM supervision and subject to stringent conditions. Discontinue nocturnal viewing if trials prove this activity detrimental to Penguins.**
- 5. Provide guided exploration of the limestone caves subject to suitable conditions.**
- 6. Encourage the use of Penguin Island by study groups, university extension courses, holiday activity programs and others. Such groups will be particularly encouraged to use the Island mid-week when there is little general visitor use. Programs will be complementary to school curricula and integrated with similar activities in adjacent areas .**
- 7. Prepare an information program to keep tourist bureaus and the local and broader communities informed about the Shoalwater area.**

4. Penguin Island has up to 1000 breeding birds and the Penguins come ashore in flocks of about 15 birds at a time. This compares to about 200 000 breeding birds on Phillip Island, Victoria.

8. Liaise regularly with concessionaires, the local tourist bureau and the WA Tourism Commission to ensure two-way information flow.
9. Prepare and implement a sign plan in accordance with the CALM Sign Manual. Include information on:
 - zoning
 - access
 - code of ethics
 - cave and sand bar hazards
 - interpretation
 - facilities
 - rehabilitation.
10. Liaise with the City of Rockingham concerning signs on Mersey Point (local authority land) and other mainland locations, placement of CALM signs, the general compatibility of all signs and information concerning CALM lands on non-CALM signs.
11. Regularly maintain and update signs when changes occur.
12. Develop the interpretive potential of research activities.
13. Recognise that use of the Islands fluctuates according to the season when providing for information, interpretation and education.
14. Consider the needs of specific market segments when developing information/interpretation programs.

23. COMMUNITY LIAISON AND VOLUNTEER INVOLVEMENT

The objective is to facilitate liaison with the community.

Ongoing liaison with local community groups and associations is essential, as is liaison with interests further afield. This is achieved by day-to-day contact between CALM staff working on the Islands and members of the public. In addition, the Shoalwater Islands Advisory Committee was formed to advise CALM during the preparation of this management plan. It provided an excellent forum for information exchange.

Members of the community are also directly involved in voluntary work in Penguin Island (about 40 people, 1992). The Park Guides provide an important information service in the Interpretation Facility and conduct guided tours, primarily during peak periods of visitor use, and play a major role in information, interpretation and education. This is part of a volunteer program established by CALM. The volunteers should continue to be nurtured and supported by CALM and close liaison maintained.

In addition, the Kwinana/Rockingham branch of the WA Naturalists Club provided assistance in rehabilitation and other programs. Further potential exists for the public to become involved during implementation of this plan. Liaison between CALM and other government agencies is discussed in Section 5.

ACTIONS

- 1. Establish a Shoalwater Islands and Marine Park Management Advisory Committee to provide advice to the Executive Director regarding:**
 - implementation of this plan**
 - management issues that may arise in the marine park**
 - preparation of a management plan for the marine park (when commenced)****Review the need for and the functions and composition of, the committee annually.**
- 2. Hold regular meetings, with the local community, other interest groups and relevant Government departments, to discuss aspects of management of the Shoalwater Islands.**
- 3. Encourage community involvement to implement the plan.**
- 4. Continue to nurture and support volunteers, including training. Expand the program's interpretation and environmental education role. Maintain close liaison.**

RESEARCH AND MONITORING

24. Research and Monitoring

24. RESEARCH AND MONITORING

RESEARCH AND MONITORING GOAL

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

OBJECTIVES

Develop an understanding of the ecology of the Islands' flora and fauna that is sufficiently detailed to provide a basis for assessing the effects of management actions.

Develop and implement monitoring programs on the Islands which will be capable of

- **assessing the effectiveness of management actions, for both conservation and recreation purposes**
- **providing a warning of undesirable changes in the Islands' biotic and physical environment.**

Monitor visitor use and the impacts of this use.

Integrate the research and monitoring of the Islands and the Marine Park

Biological Research

The Shoalwater Islands attract researchers because of their wildlife and their accessibility. The Perth metropolitan area boasts relatively few Islands and the biota on those large enough to support populations has been subject to intense interest over many years. The earliest recorded scientific interest in the fauna of the Shoalwater Islands dates to studies of the avifauna by Sedgwick (1940) and Serventy and White (1943) which provided a basic checklist of regular inhabitants. Birds have continued to dominate the attention of researchers, with more recent work by Murdoch University, notably the studies of Wooller, Dunlop and a number of graduate students (see Dunlop et al., 1988 for a summary of research to that date). Additional interest in the Islands' fauna has come from the University of Western Australia with a biogeography emphasis on both birds (Abbott, 1977) and reptiles (Costa, 1977). The research and monitoring undertaken by the tertiary institutions has contributed to management of the area.

The primary value of the Islands to sea birds is as a resting and breeding area close to food resources. Research and monitoring of the Shoalwater Islands and the Marine Park are thus closely linked. Food chains are largely external to the area proposed for management and birds, for the most part, belong to more widely distributed species. Thus the emphasis of research for Island

management should be firmly based on measuring and minimising the impacts of increasing recreational use, including redressing the effects of past use. In particular, this research should address impacts which do, or might, affect adult mortality, breeding success, recruitment and habitat utilisation.

Sea-lions and seals using the Islands as resting sites are part of research projects covering these species throughout the State. Management would benefit from a greater understanding of what levels of stress are produced by human disturbances. However, such research need not necessarily be conducted at this site.

Fauna, whose life cycles are contained entirely on the Islands, require further research. These include reptiles, for which preliminary work exists (Costa, 1977 and Arena, 1986), and invertebrates, of which we know little. A basic survey of the Islands' invertebrate fauna is required to provide the basis for its conservation.

In general, the flora of the Shoalwater Islands is well known and widely distributed. Storr (1961) and Abbott (1977) have provided comprehensive lists of the vascular flora of the Islands. Storr (1961) and Chape (1984) mapped the vegetation of Penguin Island, and Hussey (1973) has published a series of vegetation transects. The Kwinana-Rockingham Branch of the WA Naturalists Club published a field guide to the Islands in 1988.

Individual species studies on the cytology of *Pittosporum phillyraeoides* by Scrymgeour (1964) have shown the Shoalwater Islands populations to be chromosomally unique.

Studies on the invasive weed *Lavatera arborea* have been undertaken by Keighery and Alford (CALM unpubl.) since 1987. Other potential weed species are also monitored on these visits.

CALM staff have conducted limited monitoring of the area's wildlife during visits over the past two years. Data has been collected largely opportunistically by several methods. Future monitoring studies should record in a standardised form, basic quantitative information on distribution, abundance, breeding success and recruitment. The design of these studies should be adequate to allow them to be used to assess the impacts of recreational uses, management actions (including rehabilitation programs) and natural fluctuations. Coverage of species should include as many as resources permit, concentrating on those of particular conservation significance or sensitivity to disturbance.

Social Research

To more effectively manage the Shoalwater Islands, visitor surveys should be conducted to ascertain the quantitative and qualitative aspects of visitor use (types and patterns of use and visitor expectations and perceptions).

These surveys range from simple observation studies to more elaborate user surveys. It is important that visitor use is monitored to determine the effectiveness of the plan's implementation.

ACTIONS

General

- 1. Allow researchers use of the accommodation in the interpretation/management facility, on a permit basis, if available (see Section 19.4 Buildings).**

Biological

- 2. Undertake an integrated research and monitoring program for the Shoalwater Islands, the surrounding Marine Park and on similar Island and marine environments.**
- 3. Undertake specific projects into the assessment of impacts of management actions.**
- 4. Encourage appropriate research by other agencies, particularly tertiary institutions. Support projects through logistic or financial means where possible.**
- 5. Manage research projects through a research permit system to provide for appropriate projects and ensure that study sites are not disrupted.**
- 6. Specific topics requiring research include:**
 - impact of recreation activities on pest species (pigeons and Silver Gulls) and on the Islands' values for breeding and nesting habitat for seabirds**
 - enhancement of nesting sites for Penguins and other sea birds.**
 - Penguin's food supply**
 - interaction between Penguins and visitors**
 - methods of Penguin viewing**
- 7. Undertake a biological survey of the invertebrate fauna.**
- 8. Commence a monitoring program covering distribution, abundance and recruitment of selected species as soon as possible, including Sea-lions. Develop a**

list of priority species and review rive yearly in consultation with CALM Research Division and other research institutions.

- 9. Monitor the rehabilitation of the vegetation (see Section 9 and Appendix 2).**
- 10. Monitor weed species (see Section 13).**
- 11. Monitor Cheesewood (Pittosporum) and investigate methods to assist its regeneration if required (see Section 9).**

Social

- 12. Regularly monitor visitor use by gathering baseline information, including numbers of people and boats, type of recreational activities taking place and patterns of use (such as the effectiveness of the zoning scheme).**
- 13. Carry out more detailed surveys to assess visitor expectations and perceptions of interpretation/education programs.**
- 14. Ensure surveys are in accordance with CALM's visitor information statistics (VISTAT) program.**

IMPLEMENTATION

- 25. Priorities, Funding and Staff
- 26. Review and Term of This Plan

25. PRIORITIES, FUNDING AND STAFF

The actions within this management plan require funding and implementation. Priorities may vary due to changing use patterns, dynamic natural processes and availability of funds (table 2).

The Shoalwater Islands are managed from existing Ranger resources of CALM's Swan Region. Other CALM staff from the Swan Regional Office provide support and assist with works programs. Future staffing levels will be continually reassessed. CALM staff presence on the Islands will be during the day with accommodation provided for overnight use when needed in the interpretation/management facility (when completed). This will be subject to available resources. Accommodation will be sought on the mainland to replace the accommodation on Penguin Island (see also Buildings, Section 19.4).

This management plan will be implemented by CALM within the framework of available resources according to priorities within the plan and CALM regional and statewide priorities. A large budget will be needed during the first two to three years of this plan for major works. External sources of funding will be actively sought.

TABLE 2. PROPOSED PRIORITIES FOR IMPLEMENTATION

SECTION (Major Ref. see also Index to Actions)	ACTION (within each priority, actions are in order of plan format)
	Priority 1
3	Change purpose of Penguin Island to Conservation Park. Upgrade Nature Reserve, include new Islands
6	Implement zoning scheme
9	Rehabilitate vegetation (degraded areas and areas where buildings have been removed).
14	Control of pests <ul style="list-style-type: none"> • pigeons • gulls.
15	Fire control.
19	Provide a penguin viewing facility
19	Provide bins, remove litter.
19	Remove buildings.

**SECTION (Major
Ref. see also
Index to Actions)**

**ACTION
(within each priority, actions are in order of plan format)**

Priority 2

- 13 Control of weeds/planted species
- develop a weed control program with priority to removal of *Lavatera arborea*
 - map weeds, update annually
 - remove non-indigenous vegetation.
- 19.1 Delineation of anchoring and landing areas.
- 19.2 Construction of boardwalks.
- 19.3 Establish informal picnic area
- provide essential facilities.
- 19.4 Construct Interpretation/Management facility.
- 20 Delineate buffer area off Seal Island beach.
- 22 Provide and maintain signs.
- 22 Interpretation-provide
- display in facility
 - self-guided and guided interpretive walks
 - publications
 - guided tour

Priority 3

- 19.2 Upgrade and re-align walk trail
- 19.2 Lower post and rail fencing
- 19.2 Relocation and redesign of hilltop structures.

Ongoing

- 19.1 Maintain jetty.
- 19.5 Maintain Services.
- 24 Research and monitoring

Monitor

- (9) • regeneration of *Acacia rostellifera*
- (9) • regeneration of Cheesewood
- (9) • vegetation changes
- (9) • rehabilitation

**SECTION (Major
Ref. see also
Index to Actions)**

**ACTION
(within each priority, actions are in order of plan format)**

	Research
(8)	• fauna
(9)	• vegetation
(13, 14)	• impacts of weeds and pests
(15)	• fire
(24)	• impact of recreation activities
(24)	• enhancement of nesting sites for seabirds
(24)	• assessment of impacts of actions
(24)	• visitors survey once facility plan is implemented.

Criteria for priorities:

- 1 Essential for plan implementation
 - 2 Required works to achieve principal objectives
 - 3 Required works to achieve other objectives
- Ongoing or dependent on completion of other works.

ACTIONS

Within CALM's overall staffing and funding priorities the Department will seek to:

- 1. Prepare a 10-year implementation plan, taking into account the priorities outlined in Table 2. Prepare an annual progress report. Review the implementation plan annually.**
- 2. Gain an increased budget allocation for the first two to three years of this plan to carry out high priority projects and then sufficient funds to maintain this level of work.**
- 3. Ensure staff have adequate financial resources.**
- 4. Provide sufficient staff to implement this plan and to maintain new developments.**
- 5. Provide ongoing training for staff.**
- 6. Regularly review staff levels.**
- 7. Utilise volunteers where appropriate to support and complement the work of CALM staff.**

8. **Identify potential sources of external funding, and projects or areas of operation capable of attracting external funding. Pursue these sources according to departmental policy and procedure.**
9. **Investigate fees or other revenue gaining measures to recoup costs where specific services or opportunities are provided to the public.**
10. **Provide opportunities for people to contribute directly to the Island's budget, for example, through donations.**
11. **Enter into partnerships with local organisations, community groups, and local and State Government departments where economies of scale can be obtained in joint or cooperative operations.**

26. REVIEW AND TERM OF THIS PLAN

Section 61 of the CALM Act 1984 provides 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 term of this plan is 10 years.

ACTIONS

1. **Establish an implementation team to review the implementation of the plan annually, prior to preparing the works program for the following year. The review should identify which actions have been achieved and to what degree, and any new information which may affect management.**
2. **Review the plan within 10 years from the date of Ministerial approval of the Final Management Plan. This review should identify the extent to which the objectives have been achieved and actions implemented, the reasons for lack of achievement or implementation, and a summary of information which may affect future management.**

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APPENDICES

APPENDIX 1. INFORMATION ON THE SHOALWATER ISLANDS MARINE PARK

The waters of Shoalwater Bay and Wambro Sound have long been recognized as an area of high environmental significance and recreational potential (Environmental Protection Authority System 6 Report 1983 Recommendation M101).

The status and 'health' of Island wildlife reflects the diversity and richness of the shallow waters and Island reef systems as feeding areas.

WHY THIS AREA IS IMPORTANT

CONSERVATION

The Marine Park contains a diversity of marine and terrestrial habitats including limestone reefs, seagrass beds, sandy seafloors and numerous rocky Islands which are home to a host of plants and animals. These habitats are of particular importance for breeding colonies of Little Penguins and other seabirds and as resting places for the Australian Sea-lion.

Wambro and Cockburn Sound present a unique environment on the west coast with deep silty basins containing a distinctive mixture of temperate and tropical invertebrates surrounded by shallow, sandy areas with extensive seagrass beds. The decline of Cockburn Sound due to industrialisation makes Wambro Sound of critical conservation importance.

A special characteristic of this area of the Perth coast is the array of Islands and reefs which are so close to the mainland. The high value of this area for recreation depends largely on the conservation of habitats associated with these limestone structures.

A report by the Department of Conservation and Environment (now EPA) [1986] identified three major marine communities:

Intertidal Platforms

These reef platforms are influenced by many coastal and climatic processes that cause strong seasonal changes in marine communities. The easy access to these platforms from Islands, and the collection of abalone on them, has resulted in their disturbance and it is common in some areas to observe reef platforms that are severely degraded. The algae that occupy these platforms are important in the overall productivity of the area.

Subtidal Reefs

The subtidal reefs are usually dominated in the summer period by larger brown algae such as kelp (*Ecklonia*) or *Sargassum*. A number of these algae are important in the primary production of the area through their contribution to the food chain. These reefs are an important habitat for marine fauna including fish and rock lobster. Although they support a large diversity of invertebrate and fish life, these communities are found elsewhere in the metropolitan reef system.

Seagrass Meadows

The seagrass meadows are of a high conservation value. They are major contributors to the primary productivity of the area and also stabilize sand, provide habitat to marine fauna and increase species diversity.

These meadows occupy the shallows of Shoalwater Bay. They show obvious signs of damage due to the scouring action of anchors and chains. They are also strongly influenced by water and sand movement.

The meadows of the Park are made up of a number of species with 6 km² showing healthy communities.

EDUCATION/SCIENTIFIC STUDY

The special nature of the area offers many opportunities for community education on the flora and fauna, and coastal processes.

Owing to its location the Park is within easy access of schools, tertiary institutions and natural history clubs and is thus frequently used by students as well as other groups for nature study.

RECREATION

The fish and crustaceans that shelter and grow in the surrounding waters are keenly sought after by amateur fishermen.

Fishing and a range of other recreational activities including sailing, windsurfing, skiing, diving and snorkelling, all compete for space in the clear and scenic waters.

The Park is also a place where the community can relax and enjoy the Island and ocean scenery, the myriad of wildlife and cool sea breezes.

COMMERCIAL PURPOSES

Tourism

The levels of recreational use and public interaction with wildlife in the Park is rapidly increasing. The Park can provide a range of active and passive experiences for people to enjoy. Increasing use means increasing tourism and opportunities for commercial facilities and concessions, such as boat tours of the waters, reef and Islands.

Fishing

Some areas of the Park are used extensively for commercial fishing. The types and level of fishing and areas of operations will be provided for in the context of a CALM management plan and managed by the Fisheries Department.

APPENDIX 2. SUGGESTED REHABILITATION

(Source; Dunlop, 1988)

Removal of buildings and rehabilitation of the vegetation will establish continuity of the penguin nesting area, linking the northern and southern landfall locations. During revegetation, pathways trending in a north-south direction should be interspersed with plant cover to establish access to the new, potential nest sites.

Saltbush (*Rhagodia baccata*), Sea Spinach (*Tetragonia decumbens*) and *Thelkeldia diffusa* should be the main species used on the revegetation of the colony areas. Nitre Bush (*Nitraria billardieri*) could also be established because its growth form provides excellent nesting habitat. Cheesewood (*Pittosporum phylliraeoides*) and *Acacia cyclops* could be planted as a buffer or screen along the western edge of the rehabilitated colony. All these species fruit on Penguin Island, between February and April, and probably germinate best at temperatures around 15°C (Dunlop & Galoway, 1984, Klomp, 1985). With the exception of Sea Spinach, all species should be raised in tubes from seed germinated in February/March and planted out in August. The plants should be watered over the dry periods during their first spring and summer.

Sea Spinach may best be established from cuttings or fragments transplanted in August/September and watered occasionally through spring and summer. Low wooden frames about 0.5m high should be constructed in the areas to be revegetated. This will provide trelliswork for the climbing Sea Spinach under which good nesting hollows will form. The seeds of all the other species used are bird-dispersed and the wooden frames will greatly increase seed dispersal by providing perching sites in the rehabilitation areas. The regeneration of *Acacia rostellifera* from underground stems is occurring naturally in part of the rehabilitation area and should be allowed to continue and be monitored. Burrows could also be constructed using hessian bags filled with soil containing seed or implanted seedlings and fertilizer.

Once vegetation establishment is well under way, probably after two or more growing seasons, vocal luring can be utilised to increase the rate of occupation of the rehabilitation area by burrow nesting seabirds. Amplifying sound speakers can be positioned at various points in the rehabilitation area playing a continuous loop recording of Little Penguin, Little Shearwater and White-faced Storm Petrel (*Pelagodroma marina*) courtship songs. This will almost certainly increase the attractiveness of the rehabilitated nesting area to the birds.

Assisted Regeneration of Eroded Areas.

Use brush with sown seed (collect seed from species indigenous to Penguin Island) to reduce sand movement. Initially lay brush on the walls of the narrow necks of blow outs (rather than the open,

low energy areas) as these areas funnel the wind and supply sand to the advancing dune. Bury mature female heads of *Spinifex longifolius* in sand under brush to produce early vegetation cover.

NOTE: Rehabilitation has commenced using these methods in areas where buildings have been removed.