

Monkey Mia Reserve

Draft Management Plan

1993



Department of Conservation
and Land Management



World Heritage



Shire of Shark Bay



Monkey Mia

MONKEY MIA RESERVE

DRAFT MANAGEMENT PLAN

Department of Conservation and Land Management and
the Shire of Shark Bay
Perth Western Australia 1993
(Printed on Recycled Paper)

WHAT DO YOU THINK?

The Department of Conservation and Land Management want to know what you think of the proposals in this draft management plan. Have you thought about writing a submission?

Why write a submission?

It is an opportunity to provide information, express your opinion, suggest alternatives and have a say on how the Shire of Shark Bay and CALM are proposing to manage Monkey Mia Reserve over the next 10 years. If you prefer not to write your own submission you could make a joint submission with others.

What happens to your submission?

All submissions will be summarised according to the topics discussed. The draft management plan will then be reviewed in the light of submissions, according to established criteria (see below). Public submissions will be reviewed by the Monkey Mia Management Committee in the process of developing the final plan. A summary of the submissions will be published with the final management plan, including an indication of how the plan was amended or not in response to the submissions. If a submission is marked "CONFIDENTIAL" the author will remain anonymous in the analysis of submissions.

What criteria will be used in assessing your submission?

1. The draft management plan *will* be amended if a submission:
 - (a) provides additional resource information of direct relevance to management;
 - (b) provides additional information on affected user groups of direct relevance to management;
 - (c) indicates a change in (or clarifies) Government legislation, management commitment or management policy;
 - (d) proposes strategies that would better achieve management goals and objectives;
or
 - (e) indicates omissions, inaccuracies or a lack of clarity.

2. The draft management plan *will not* be amended if a submission:
 - (a) clearly supports the draft proposals;
 - (b) offers a neutral statement or no change is sought;
 - (c) addresses issues beyond the scope of the plan;
 - (d) makes points which are already in the plan or were considered during plan preparation;
 - (e) indicates strongly opposing views to the preferred management option; or
 - (f) contributes options which are not feasible (generally due to conflict with existing legislation, or Government, Shire or departmental policy).

What makes an effective submission?

To ensure your submission is as effective as possible:

- make it concise and clear.
- list your points according to the subject sections (and page numbers) in the plan.
- describe briefly each subject or issue you wish to discuss.
- say whether you agree or disagree with any or all of the objectives or strategies within each subject or just those of specific interest to you; clearly state your reasons (particularly if you disagree) and give sources of information where possible.
- suggest alternatives to deal with any issue with which you may disagree.

It is important to indicate those strategies and recommendations you agree with as well as those with which you disagree.

Each submission is important, but those that give reasons for concerns, give support where appropriate and offer information and constructive suggestions are most useful.

DEADLINE

Submissions are welcome for two months after the date of release of this draft plan. For enquiries please phone (099) 215 955.

WHERE TO SEND YOUR SUBMISSION

Written submissions should be sent to:

The Regional Manager
Department of Conservation and Land Management
PO Box 72
GERALDTON W.A. 6530

Attention: Regional Planning Officer

PREFACE

Monkey Mia Reserve is jointly vested in the Executive Director, Department of Conservation and Land Management (CALM), and the Shire of Shark Bay. This draft management plan has been prepared by CALM on behalf of the Monkey Mia Reserve Management Committee and in consultation with the Shire of Shark Bay.

The draft plan will be available for public comment for two months, after which the final management plan will be prepared. The final plan will need to be approved by CALM's Executive Director and the Shire of Shark Bay before it can be implemented. Since Shark Bay is a World Heritage Area, the final management plan will also require the approval of the World Heritage Area Ministerial Council*.

This draft management plan details policies and strategies for the joint management of Monkey Mia Reserve by the Shire of Shark Bay and CALM. The plan will be in place for not more than 10 years after it is approved and adopted.

* The Shark Bay World Heritage Area Ministerial Council is in the process of being established. It is expected to comprise State and Federal Ministers including the respective Ministers for the Environment.

ACKNOWLEDGEMENTS

CALM's planning team for Monkey Mia Reserve comprises Ron Shepherd, Andrew Hill, Greg Leaman and Allan Padgett. The planning team has worked closely with the Shire of Shark Bay and the Monkey Mia Reserve Management Committee during the preparation of the draft management plan, who are acknowledged for their interest and effort. Special thanks to Mick Oliver, the Shark Bay Shire Clerk for his assistance with the plan.

Valuable comment was provided by Monkey Mia Rangers, dolphin researchers and CALM's specialist branches. Particular thanks to Debbie Bowra (word processing), Aminya Koch (technical assistance) and Richard Grant (editing), and to CALM's Land Information Branch for map production.

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1.0 INTRODUCTION

1.1 OVERVIEW

Monkey Mia Reserve is located on the eastern shore of the Peron Peninsula, 25 km east of Denham (Figure 1). The Reserve, originally gazetted in 1890 for the purpose of "Government Requirements" following a request by a pearler for land to depasture sheep, was used as a base for the pearling and fishing industries. In 1890 it had a population of 135 (*West Australian*, 27 December 1890).

Monkey Mia is now known for the Bottlenose Dolphins (*Tursiops truncatus*) that have been entering the shallows of the bay for about 30 years to take fish from humans, an interaction started by local fishers. A caravan park was established in 1975 and soon the area, and the dolphins, became a tourist attraction.

The interaction between dolphins and people received wide publicity, and rapidly increased the area's popularity, to a point where the existing facilities were not sufficient to cope with the demands being placed on them. The need for better facilities was recognised and in 1985 an Information Centre was constructed. A special State Government grant was provided in 1988 to develop roads, carparks and toilets, and for landscaping. In October 1988 the Monkey Mia Reserve was jointly vested in the Executive Director, CALM and the Shire of Shark Bay to recognise the area's recreational and environmental values. Previously the Reserve was vested only in the Shire. The gazetted purpose of the Reserve is for "Recreation", although this management plan proposes the purpose be amended to "Recreation and Conservation of Fauna and Flora" (Section 2.3). The adjacent caravan park reserve is separately vested in the Shire of Shark Bay (refer Section 2.3) and is solely under the Shire's jurisdiction. The caravan park was redeveloped and upgraded in 1990.

In 1988 the State Planning Commission and CALM produced the *Shark Bay Region Plan*, a framework for developing the Region and conserving the environment. The Region Plan also indicates how Monkey Mia fits into the regional context and sets a broad framework for its development.

Monkey Mia has high conservation values and is vital to the region's future prosperity, being one of the major attractions for visitors to Shark Bay. Its very high tourism values can be expected to become more pronounced as the community becomes better acquainted with the World Heritage listing of Shark Bay. It is important, therefore, to protect the Reserve and this is best achieved by producing a comprehensive management plan.

The waters adjoining Monkey Mia were declared a Marine Park on 30 November 1990. Because of the close proximity, some issues, such as the dolphins' interaction with people, will be dealt with in this plan as well as in a management plan for Shark Bay Marine Park, which is currently being drafted.

This plan will also complement the management plans being prepared for adjacent areas, including the Francois Peron National Park.



TENURE MONKEY MIA

Scale

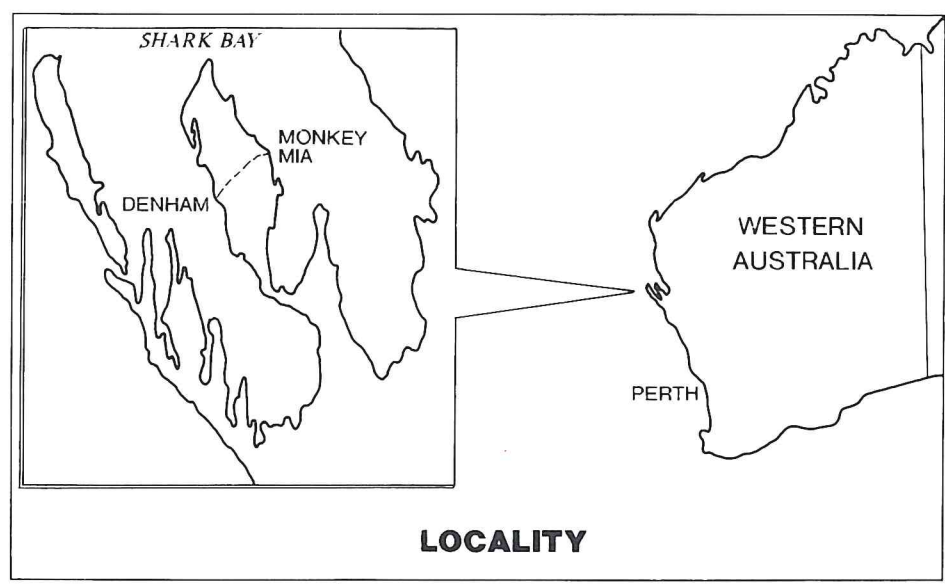
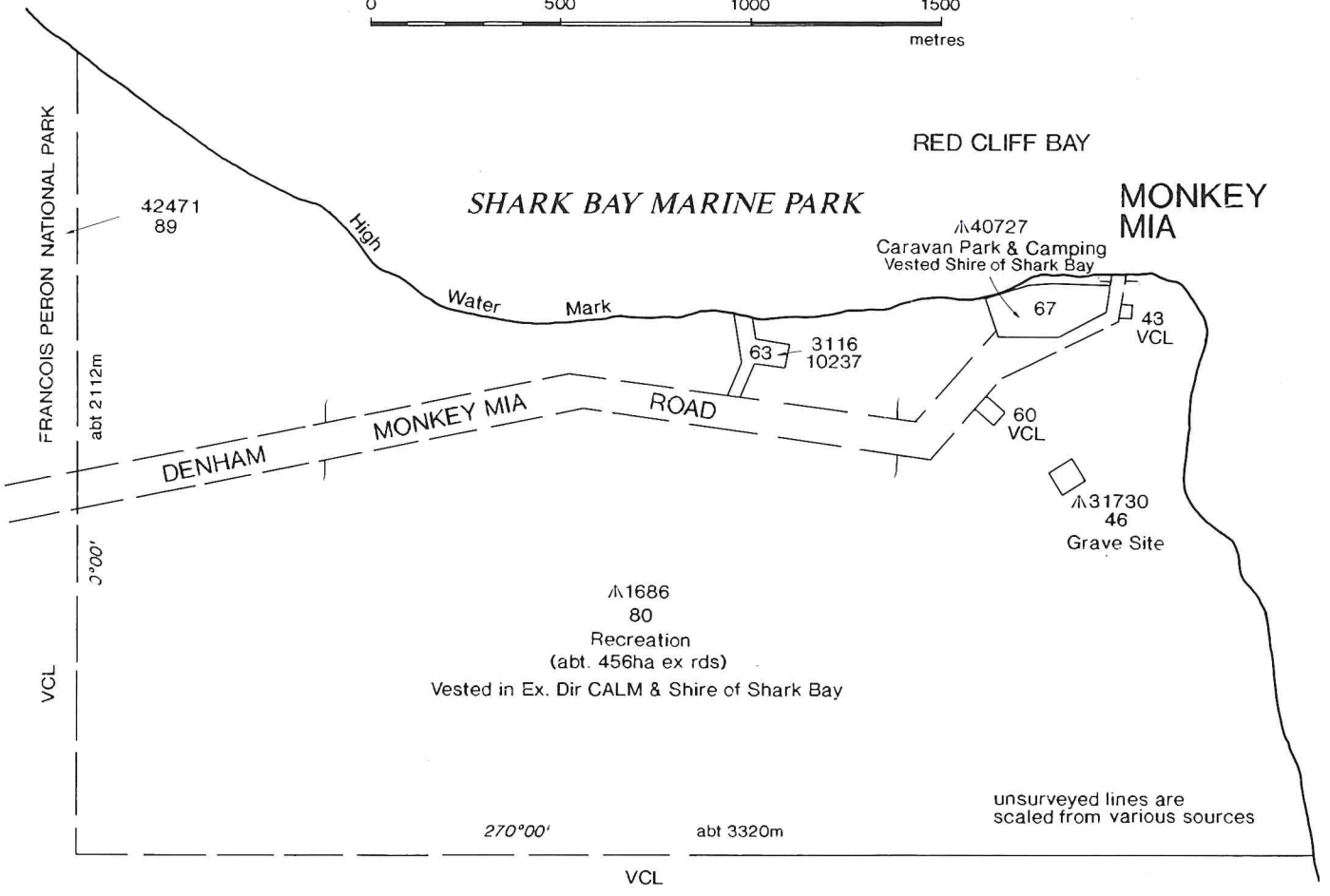


Figure 1

1.2 REGIONAL ECONOMIC SIGNIFICANCE

Tourism is becoming increasingly important to Shark Bay, a point noted in the Shark Bay Region Plan in 1988. Of the area's wide array of attractions, Monkey Mia is the region's most popular. It is known nationally and internationally for the interaction between dolphins and people which has led to a vast increase in the number of people visiting the area (Section 5). Although visitor numbers fluctuate they appear to have plateaued at around 90 000 - 100 000 a year. This rate can be expected to increase as the area becomes better known, especially as a result of its World Heritage Listing.

The Shark Bay World Heritage Area (Section 1.4) provides a broad range of opportunities for recreation and tourism. Many of these are of the kind recently referred to as "nature - based tourism", that is, the kind of tourism which is based on undisturbed natural areas, is non-damaging nor degrading, contributes to protecting and managing areas used and is subject to an adequate and appropriate management regime. The number of people wanting to understand and experience natural areas is rapidly increasing, and pressures upon the special places which visitors value is rising accordingly.

The economic returns from tourism are becoming more important to management, as the focus shifts from government funding of conservation management to an emphasis on a user-pays system, where those enjoying the direct benefits of an experience contribute to the sustained management of the particular resource.

Natural phenomena may be essential to the tourism experience or may be what enhances the experience. The dolphins of Monkey Mia provide a focus for tourism in Shark Bay, but remain only a small part of the total spectrum of recreational opportunities available in the region. However, because of its popularity and importance, Monkey Mia's long-term protection and the protection of the values it supports is essential to maintaining a healthy tourism industry and strong regional economy in Shark Bay.

1.3 CONSERVATION SIGNIFICANCE

The human-dolphin interaction at Monkey Mia is particularly significant because it has been occurring over such a long period when compared to similar experiences elsewhere in the world. It, therefore, has world-wide conservation and cultural value as well as being an excellent site to study the behavioural patterns of wild dolphins. The Peron Peninsula, on which Monkey Mia is located, is the last known major habitat in Western Australia for the Thick-billed Grasswren, a species declared threatened under the Wildlife Conservation Act. Its numbers and range are believed to have declined because grazing modified its habitat. Monkey Mia Reserve has a relatively high density of the Thick-billed Grasswren and is an important area to maintain the species. The Reserve also has striking landscape values and scenic qualities with its distinctive red dunes and cliffs, white beaches and adjoining waters.

1.4 SHARK BAY WORLD HERITAGE AREA

Shark Bay was nominated in October 1990 and included on the World Heritage List in December 1991. It was nominated on the basis of its natural values and when listed was one of only 11 places on the World Heritage List to satisfy all four natural criteria. These criteria are:

- outstanding examples representing the major stages of the Earth's evolutionary history
- outstanding examples representing significant ongoing geological processes, biological evolution and human interaction with the natural environment
- certain unique, rare or superlative natural phenomena, formations or features of exceptional natural beauty
- the most important and significant habitats where threatened species of plants and animals of outstanding universal value from the point of view of science and conservation still survive.

Shark Bay also possesses significant cultural features with evidence showing an Aboriginal presence dating back at least 25 000 years. Shark Bay is of great historic importance with early European landings, explorations and scientific investigations from 1616 onwards¹.

* It should be noted that the dolphin - human interaction at Monkey Mia is not an identified World Heritage value, but it is important in the overall context of protecting Shark Bay's values.

2.0 PRINCIPAL MANAGEMENT DIRECTIONS

2.1 JOINT VESTING

Reserve 1686 (Monkey Mia Reserve) is an area of approximately 456 ha jointly vested in the Executive Director, CALM and the Shire of Shark Bay for the purpose of "Recreation". This management plan proposes that the purpose of the Reserve become "Recreation and Conservation of Flora and Fauna" (Section 2.3). The Monkey Mia Reserve Management Committee is a joint Shire of Shark Bay - CALM body established to provide advice and direction in management decisions relating to the Reserve, and on adjacent lands and waters as they relate to the Reserve.

2.2 MANAGEMENT GOALS

The Monkey Mia Reserve will be managed to conserve the natural and cultural environment, and allow appropriate recreation and tourism. The overall goals for the Reserve are to:

1. **Protect the Monkey Mia dolphin population and habitat from adverse impacts.**
2. **Plan and manage Monkey Mia to enhance the interaction experience between dolphins and humans.**
3. **Provide for and encourage recreation and tourism activities that are consistent with maintaining the Reserve's conservation values.**
4. **Manage further development of Monkey Mia within the guidelines of the Shark Bay Region Plan.**
5. **Provide information to enhance visitor awareness of dolphin and marine mammal ecology, marine conservation and arid environments.**
6. **Conserve and protect all the Reserve's fauna, flora, landscape and cultural values.**
7. **Promote and undertake the scientific study and monitoring of the Reserve's physical, biological and social values.**

2.3 LAND TENURE AND PARK BOUNDARIES

The objective is to ensure that land tenure is appropriate and boundaries encompass the Reserve's environmental and cultural values while representing practical management boundaries.

Three Reserves are located at Monkey Mia (Figure 1):

Reserve 1686 (Lot 80) - the Monkey Mia Reserve is a C Class reserve of 456.35 ha with the purpose of "Recreation". It was originally vested only in the Shire of Shark Bay, however, it was jointly vested with CALM's Executive Director on 11 October 1988. The Reserve's boundary extends to high water mark. Monkey Mia Reserve is landlocked by the former Peron Station which was purchased by the Western Australian

Government in October 1990. The area of the former Peron Station north of Monkey Mia Road is vested in the National Parks and Nature Conservation Authority (NPNCA) as Francois Peron National Park. The Reserve also adjoins Shark Bay Marine Park. The area south of Monkey Mia - Denham Road is currently vacant Crown land.

Lot 63 situated west of the caravan park, is leased for the purpose of "Loading and Unloading Stock". It expires in 1998. This lease is directly associated with the pastoral lease covering Faure Island, and if the pastoral lease is transferred or terminated the landing lease will also be transferred or terminated. The landing lease is fenced to ensure no unauthorized public access and that stock do not escape into the Reserve.

Two areas of vacant Crown land, locations 43 and 60, are enclaves within the Reserve.

Reserve 40727 (Lot 67) - this C Class reserve of 3.75 ha is vested in the Shire of Shark Bay for the purpose of "Caravan Park, Chalets and Camping", and is leased to the owners of the Monkey Mia Caravan Park. This management plan does not apply to Reserve 40727.

Reserve 31730 (Lot 46) - this is an unvested C Class reserve of 0.4 ha that contains an historic gravesite.

Issues

- The purpose of "Recreation" for Monkey Mia Reserve does not fully recognise the Reserve's conservation values.
- C Class vesting is not appropriate security.
- Reserve 31730 (Gravesite) is not vested. However, it requires management and, therefore, should have a vested authority.
- Locations 43 and 60 should be included in the Reserve.

Recommendations

1. Upgrade Reserve 1686 (Monkey Mia) to an A Class reserve and change the purpose to "Recreation and Conservation of Flora and Fauna".
2. Cancel Reserve 31730 (gravesite) and incorporate into Reserve 1686.
3. Include locations 43 and 60 (vacant Crown land) in Reserve 1686.

2.4 ZONING OF ADJOINING WATERS

Section 62 of the Conservation and Land Management Act 1984 (the CALM Act) allows for zones to be gazetted in marine parks, with particular aims and regulations. Zoning is used to protect an area's conservation and recreation values by limiting the types of activities that can occur. This is useful in reducing conflict between users and is important in protecting natural and cultural values. The Shark Bay Marine Reserves Management Plan will outline the various zones adjacent to Monkey Mia, taking into account the values and management strategies outlined in this Plan. Appropriate Regulations will apply to these zones.

3.0 RESERVE ADMINISTRATION

3.1 MONKEY MIA RESERVE MANAGEMENT COMMITTEE

An effective administration is required to manage finances, human resources, environmental values and maintenance. Since the Reserve is jointly vested in the Shire of Shark Bay and CALM, the various roles and responsibilities of each organisation need to be established to ensure optimum management. For this reason the Monkey Mia Reserve Management Committee was formed with a voting membership of two representatives from both CALM and the Shire and an independent chairperson (currently being the Director of the Gascoyne Development Commission).

The Committee will be responsible for developing and reviewing the management plan, a three-year rolling program and an annual works and expenditure program. It will use its discretion in addressing and resolving matters referred to it or raised by Committee members, and will provide direction on issues not covered in the management plan. The Committee will liaise with appropriate bodies, or comment on matters referred to it that relate to activities on adjacent lands or waters that might impact on the Reserve. It will meet quarterly, or as required.

3.2 MANAGEMENT RESPONSIBILITIES OF CALM AND SHIRE OF SHARK BAY

Daily management is to be carried out according to the management plan. Any operational or management procedures not addressed in the management plan, or proposed to be conducted contrary to this plan, should be formally authorised by the Committee.

The Shark Bay Shire in consultation with CALM's District Manager and in accordance with this plan, will develop a three-year rolling program covering administrative, operational and capital works. It is to be formally approved by the Committee and reviewed annually.

The Shire Clerk will also, in consultation with CALM's District Manager and on the basis of the three-year rolling program, develop an annual works and expenditure program. The program will detail projected staff and maintenance costs as well as any proposed new works or facilities. It will be presented to the Committee in May each year for formal adoption. The program may be revised during the year by the Committee.

CALM's responsibility will be to design facilities, plan recreation sites, ensure the well-being of the dolphins (feeding and interaction policies), conserve natural values, and prepare interpretation and information material.

The Shire's responsibilities will be to direct and manage staff, maintain infrastructure, such as buildings, plant, assets, and equipment, administration and accounting, and the day-to-day administration of commercial operations.

The Shire and CALM will jointly prepare staff duty statements, and determine staff selection criteria and training requirements. The Shire will have the final responsibility regarding offers of employment and termination notices.

3.3 FINANCIAL MANAGEMENT

The objective is to manage the Monkey Mia Reserve on a self funding basis.

Before 1985 no facilities existed at Monkey Mia and no formal management was practiced. In 1985 the Dolphin Information Centre was built and in 1986 a carpark, entrance toll booth, landscaping, barbecues and a boat ramp were established. Once these facilities were established visitors were charged entrance fees to recoup ongoing staff and maintenance costs.

On 18 April 1989 the Minister for Local Government gave approval for the Shire of Shark Bay to establish a Trading Fund to facilitate the operation of the Monkey Mia Dolphin Information Centre. This was on the understanding that the Information Centre would not be expanded to infringe upon other areas currently serviced by existing businesses within the Shire.

The Centre sells a variety of souvenirs relating to dolphins. Suggestions are regularly made by salespeople to expand the lines. Visitors have expressed a desire to buy a greater variety of goods from the Centre so as to contribute to the management of Monkey Mia.

Income from the Reserve is currently sufficient to ensure self-funding of management costs and minor capital improvements. The financial system needs to be open and accountable, and to satisfy legislative requirements.

Issues

- Further increases in charges would be unpopular, but if costs rise then fees may have to rise accordingly.
- Inadequate staffing can result in entrance fees not being collected, as this task has a lower priority than protecting dolphins.
- The position of the entrance booth allows some visitors to avoid paying entrance fees.
- Currently, users of the boat ramp are not charged entrance fees, and the management costs of this facility are not recouped. It also enables some visitors to avoid paying fees for using other facilities.
- Capital funds are required to expand the Dolphin Information Centre and improve signs and visitor facilities.
- The current restriction on the operation of the Information Centre does not allow adequate servicing of the needs of visitors.

Recommendations

1. Place all income received from the Monkey Mia Reserve into a trading fund administered by the Shire of Shark Bay on behalf of the Management Committee. The Shire will produce financial reports, and process payments and income. These accounts will be audited yearly.
2. Before each financial year, the Shire and CALM will produce an annual works and expenditure program for Management Committee approval. An operating surplus should be set aside for capital works.
3. Review entrance fees annually on the basis of the projected works program.
4. Re-locate the entrance fee collection booth to ensure all visitors pay entrance fees.
5. Impose a separate fee for use of the boat ramp.
6. Exempt Shark Bay Shire residents from paying to use the boat ramp and other Monkey Mia facilities.
7. The Shire will produce a quarterly financial report for review by the Management Committee.
8. Request the Minister for Local Government to remove the restriction on the operation of the Dolphin Information Centre.

3.4 STAFF

The objective is to maintain sufficient staff with the necessary skills at Monkey Mia to educate and inform visitors to the Reserve, protect environmental values and enhance the visitor's experience.

Six Shire Rangers are currently employed on a full-time basis at Monkey Mia. Duties include staffing the Dolphin Information Centre, which is open every day of the year, supervising dolphin feeding and their interaction with people, and collecting fees. Current working conditions do not allow for a staff presence in the area for all daylight hours in summer, and thus there are periods when dolphins appear at the beach but there are no staff present. More staff would enable a greater emphasis to be given to informing and educating visitors, public compliance of rules and regulations and managing the greater Reserve area.

Staff numbers, however, are limited to available finance raised from entrance fees, and currently it is not possible to employ more rangers. One option available to overcome staff shortages is to develop a volunteer program for Monkey Mia. CALM has successfully developed such programs throughout the State to assist in managing recreation areas. The effectiveness of such a program depends on selection, training, onground assistance and recognising the role of volunteers. Selection and training of volunteers is essential to ensure that the standards of work performed and image of

Ranger staff is not reduced through volunteer assistance. Volunteers could come from conservation groups, researchers working at Monkey Mia or from the local community. The Shire would be responsible for organising and managing a volunteer program. However CALM could provide advice on implementing such a program.

Issues

- A minimum of three staff is needed on site for each shift, and in peak seasons an extra Ranger is required to effectively supervise the large number of people on the beach. Therefore, with staff leave and rostering, a minimum of six Rangers is required.
- Volunteers could assist Rangers, particularly in peak seasons providing they were properly trained.
- Personal contact with Rangers is the best educational medium that can be used, therefore staff numbers should be maximised to perform this important function.

Recommendations

1. Assess the training needs of staff and implement a program to ensure high standards are maintained. The Shire and CALM will be involved in this process.
2. Investigate developing a volunteer program and train volunteers to assist Rangers at peak times.
3. Maintain sufficient staff to staff the Dolphin Information Centre, maximise interaction with the public, supervise dolphin interaction, maintain Reserve facilities and collect fees.
4. Investigate other forms of revenue raising to fund Reserve management.

3.5 LEGISLATION

The objective is to provide the legislative framework and staff powers required to implement the objectives for the Reserve.

Seeking public support and compliance through education and liaison is both the Shire of Shark Bay's and CALM's philosophy. However, Rangers must have sufficient powers and the ability to enforce Regulations and By-Laws to maintain the Reserve's values.

Four Acts apply directly to the management of Monkey Mia Reserve and adjacent area of the Shark Bay Marine Park.

The **Local Government Act 1960** allows the Local Authorities to prescribe By-Laws and Regulations for purposes such as controlling visitor activities and commercial operations on the Reserve. The Shire is responsible for enforcing these By-Laws and Regulations. They cover such things as camping, dogs, littering and vehicle use, as well as giving the Shire the power to charge entry fees and other charges. They are also required to regulate commercial operations on the Reserve to ensure compliance with established conditions, for example, promotion, area of operation and licence fees. Such

regulatory measures are only applicable above the high water mark. This regulatory function will be reconciled with operations regulated by CALM below high water mark. To enforce the By-Laws and Regulations the Local Authority is required to gazette staff as "Authorised Officers" in respect of the Act.

Below high water mark, that is, the beach and waters of the Marine Park, the **Conservation and Land Management Act 1984** (CALM Act) and Regulations apply to visitor activities and commercial use. CALM is responsible for administering this legislation and designation as a CALM Officer enables it to be enforced.

The **Wildlife Conservation Act 1950** provides for the conservation and protection of flora and fauna throughout the State and its waters. The Act enables the regulation and control of visitor and commercial activities which have the potential to harm or disturb wildlife. The draft Wildlife Conservation Bill 1992, which has been released for public comment, contains provisions relating to human interaction with marine fauna. CALM is responsible for administering the Wildlife Conservation Act and Regulations.

To enforce the Wildlife Conservation Act a person must be designated a Wildlife Officer or Honorary Wildlife Officer. Trained CALM staff with this designation are not always readily available at the Reserve at times of incidents relating to flora and fauna. Monkey Mia Rangers currently have not been assigned powers to enable them to enforce the Wildlife Conservation Act. Consideration must be given to appointing Rangers as Honorary Wildlife Officers so that the management strategies outlined in this plan can be implemented.

Fishing is regulated under the **Fisheries Act 1905**. Comprehensive regulations may be required for the adjoining marine park incorporating, where appropriate, recommendations contained in this management plan.

Issues

- Appropriate By-Laws and Regulations under the Local Government Act are required to manage visitor and commercial activities in the Reserve.
- Regulations and By-Laws prescribed under other legislation must be compatible.
- Staff require powers to enforce the relevant Acts, Regulations and By-Laws to achieve the objectives of this Plan.

Recommendations

1. Prescribe suitable By-Laws and Regulations under the Local Government Act to cover visitor and commercial activities on the Reserve.
2. Ensure By-Laws and Regulations for the Reserve are consistent with the regulations prescribed for the adjoining lands and waters.
3. Identify the need for recreational fishing regulations in the adjoining Shark Bay Marine Park, for the Fisheries Department's consideration.
4. Provide staff with the authority to enforce the relevant Acts, By-Laws and Regulations on the Reserve.

4.0 ACCESS

The objective is to provide access while maintaining the Reserve's conservation, recreation and cultural values.

The main access to the Reserve is via a sealed road from Denham. A regular bus service operates to Monkey Mia and many coach lines visit the Reserve as part of organised tours. A 17 passenger hovercraft also travels from Carnarvon to Monkey Mia, given suitable numbers and weather conditions. Access by aircraft is currently restricted, but the construction of a larger airstrip near Denham could lead to a significant increase in visitor numbers.

Vehicle access within the Reserve is currently uncontrolled. Old access tracks to beaches, camping sites, gravel pits and borrow pits are used, and a large number of new tracks have been established. The result is a maze of unnecessary tracks, especially near the coast, which are causing erosion and degrading vegetation. The most obvious erosion is found on the red cliffs adjacent to the shore where vehicles have been driven down onto the beach.

Pedestrian access within the Reserve is focused on the beach and the unmarked walk track (Section 5.5). Vehicle and pedestrian movement within the facility area affect dissemination of information, collection of fees and the use and effectiveness of facilities. Currently vehicles move in an anti-clockwise direction into the facility area. Visitors can access the boat ramp, or enter the carpark through the entry booth. This includes visitors who are accessing the caravan park who, after passing the entry booth, turn off into the caravan park. Pedestrian movement is directed toward the Dolphin Information Centre, as this is the primary focus for visitors and visitor management.

Issues

- Access to Monkey Mia is predominantly by road transport. However, access by aircraft via Denham could increase in the future.
- Uncontrolled access to the beach and illegal camping are causing erosion and degrading vegetation.
- The vegetation is easily damaged and soils are susceptible to erosion.
- Access to the main gravel pit is required.
- Uncontrolled 4WD use and camping has resulted in erosion, vegetation degradation and littering.
- Undefined walk tracks are used by visitors resulting in erosion, particularly on the red sand dunes south-west of the caravan park.

Recommendations

1. Produce a Master Development Plan for the Reserve, delineating access, recreation sites and support facilities (Section 5.7.1). Submit this Plan to the Management Committee for its approval.

2. Maintain tracks required for service and management access, and erect gates as necessary and appropriate signs. The public will not be permitted vehicle access along these tracks.
3. Close and rehabilitate all other tracks.
4. Establish defined walk trails to provide a range of experiences. Promote walk trail and access routes through site orientation information at the Information Centre and the caravan park.

5.0 TOURISM AND RECREATION

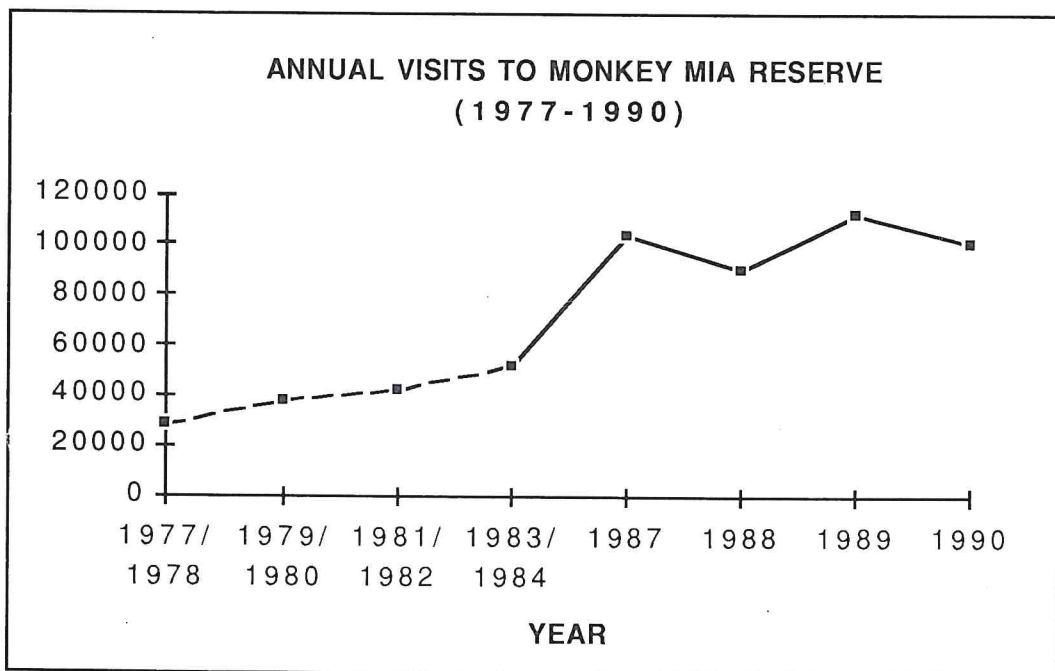
The objective is to provide visitors with a broad range of recreational activities within the Reserve while minimising environmental impacts and conflict between users.

A wide range of activities occur or could be provided on the Monkey Mia Reserve and adjoining waters. These range from passive activities such as bird watching to activities such as boating. It is important for maintaining Monkey Mia's conservation values that appropriate recreational and tourism activities are encouraged. Ideally, areas could be set aside to allow for a wide range of activities, but insufficient space is available on Monkey Mia Reserve to cater for all recreational activities. Fortunately many of these activities can be catered for elsewhere in the Shark Bay World Heritage Area.

In determining what recreational activities should be encouraged, this plan attempts to provide for as many alternative activities as possible to reduce pressure on the dolphins (Section 6.7) and to enrich visitor experience and appreciation of Reserve values. Encouraging a range of appropriate activities will reduce the amount of time visitors spend interacting with the dolphins, provide a more diverse experience, and reduce visitor pressure on the beach.

Monkey Mia has always been a popular destination to see dolphins, fish, swim and for boating in its calm waters, which led to a caravan park being built there in 1975. Its use was relatively low, probably in the order of 10 000 people a year because it was difficult to access, its lack of facilities and the lack of public awareness of its attractions. Visits rose slowly until the mid 1980s when access and facilities were improved and the public became aware that dolphins interacted with people at Monkey Mia. The Denham - Hamelin Road was sealed in 1985 and the Denham - Monkey Mia Road was sealed in 1988. This led to a massive increase in the number of visitors over a short period of time. Actual visitor numbers before 1987 are not available. However, estimates have been made using other road and tourism surveys. While these figures cannot be considered accurate, they indicate trends in visits (refer Figure 2). Annual visitor numbers rose from about 38 000 in 1985-6 (using Western Australian Tourism Commission survey data) to over 114 000 in 1989 and 102 000 in 1990. Since then visitor numbers have remained around 90 000 per annum.

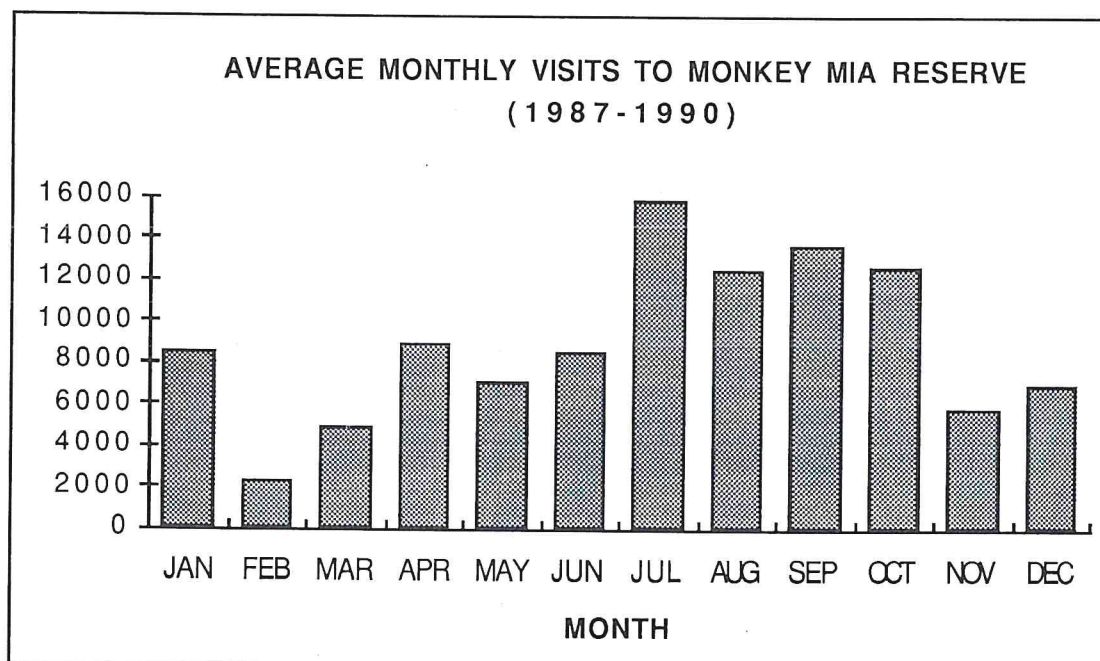
FIGURE 2



Surveys show an increasing rate of visits to Monkey Mia from interstate and overseas. Visitor surveys also reveal that revisits to Monkey Mia are not common, with the majority of people visiting for the first time (72%; WATC 1988).

Figure 3 shows the average monthly visitor figures over the last four years. This shows a very constant seasonal pattern, with four major peaks occurring during Western Australian school holidays. July is the most popular month (15 500 visitors/month) and February the least popular (2500). This is due to the uncomfortably hot summer weather experienced at Shark Bay and the comparatively pleasant winter.

FIGURE 3



It is important to note that visits to the Shark Bay Region rely heavily on the dolphins at Monkey Mia. In the 1988 WATC survey, 70% of people surveyed said the main reason for visiting Shark Bay was 'to see the dolphins'.

To provide a range of recreational activities within the constraints that exist at Monkey Mia, it has been necessary to set aside beach areas for specific uses. This strategy identifies a use or activity considered as a priority (for example, dolphin interaction) and restricts conflicting use (for example, boating) in that area to ensure access and the quality of the activity is not compromised. Five areas have been proposed - Commercial Activities Area, Beach Mooring Area (for overnight visitors), Dolphin Interaction Area, Beach Mooring Area (for professional fisherman, commercial operators and day visitors) and a No Beach Mooring Area (for recreational beach fishing). These areas are discussed in the relevant sections of this plan, and are shown in Figure 4.

Issues

- Since dolphins are the major reason people visit Monkey Mia, continued visits depend on the presence and health of the dolphins.
- Visits are dominated by first timers - with very few repeat visits.
- Visits are highly seasonal and peak during school holidays.
- Access to dolphin viewing areas for disabled visitors is difficult.
- Annual visitor numbers are currently around 90 000 per year but can be expected to increase slowly as facilities and access are improved, and awareness about Monkey Mia and Shark Bay increases (especially with World Heritage Listing and the increased interest as a consequence of this listing). The improvement in facilities may also cause a change in the type of visitor to Monkey Mia.
- The number of interstate and overseas visitors is increasing which has implications for disseminating information about the Reserve and its values.
- Owing to the long distances from major population centres, the frequency of visits will be affected by the state of the economy and petrol price increases. This may be the reason for the decrease in the 1990 visitor figures (Figure 2).
- Monkey Mia has one of only four boat ramps in the Denham - Monkey Mia area.
- Developing facilities such as the jetties and boat ramps at other locations is limited because of shallow waters and seagrass beds.
- Visitor use is concentrated in a relatively small area.
- A number of the activities undertaken at Monkey Mia are incompatible. Designating areas for specific uses is necessary to ensure safety for users and to protect conservation values.
- Passive activities such as walking, swimming and nature observation have less impact on the environment, so they should be favoured.
- Some activities conflict with the quiet relaxed atmosphere of Monkey Mia.
- Some activities such as fishing and boating could be harmful to dolphins and dugongs and, therefore, are not compatible in certain areas.
- The beach area adjoining the Dolphin Interaction Area is sometimes used for informal sporting and leisure activities, for example, beach volleyball and cricket, which may affect the interaction experience.

5.1 CAMPING

Both the Francois Peron National Park and the Monkey Mia Caravan Park cater for camping. Informal camping on the Reserve has contributed to erosion and degraded vegetation, particularly on the cliffs at Red Bluff. Associated problems with littering, hygiene and firewood collection have occurred with camping in the past. An Aboriginal site has been disturbed.

Recommendation

Prohibit camping in the Reserve.

5.2 RECREATIONAL FISHING

Recreational fishing is a popular activity at Monkey Mia. Fisheries legislation prohibits net fishing within 800 metres of the Monkey Mia jetty, however line fishing occurs from boats and the shore and cockles are collected east of the jetty. Fishing has the potential to conflict with other uses at Monkey Mia and impact on the Reserve's conservation values.

Fishing conflicts with other activities in the existing Dolphin Interaction Area and the main swimming area. Given this and the predicted increases in visitor numbers, fishing should not be permitted in the Dolphin Interaction Area or the swimming area. The area east of the hovercraft landing site is popular for beach fishing and should be specifically set aside for this purpose. No beach mooring will be permitted in this area (Figure 4) to give priority to beach fishing.

Fisheries' regulations require fish caught at sea to be transported to shore whole (or gutted). Disposal of fish offal on the shore is currently a problem and contributes to the Silver Gull problem (Section 6.8). Providing fish cleaning tables and offal bins with secure lids will overcome these problems.

Recommendations

1. Permit line fishing from the shore and the jetty except where these adjoin the Dolphin Interaction Area.
2. Consider prohibiting boat fishing in the Dolphin Interaction Area in the Shark Bay Marine Reserves Management Plan.
3. Provide fish cleaning tables and offal bins with secure lids. The design should be sympathetic with the local environment.
4. Prohibit beach mooring in the area shown in Figure 4.

5.3 BOATING

Boating is a popular activity at Monkey Mia and the size of boats can vary from small dinghies to larger vessels. The boats are launched at the boat ramp east of the jetty, and are often moored east of the boat ramp or on the beach adjacent to the caravan park. Congestion occurs east of the boat ramp with tour operators, professional fishermen and pleasure craft all landing in this small area. This will need to be monitored and if conflicts occur landing space may need to be reserved for tour operators.

Two beach mooring areas are proposed. An area adjacent to the caravan park will be set aside for overnight visitors to Monkey Mia. 30 beach moorings will be installed and maintained; no private moorings will be permitted (Figure 4).

The second mooring area will be set aside for use by professional fisherman, commercial operators and day visitors. This will extend from the jetty east for approximately 120 metres, and will incorporate the hovercraft landing area.

Recreational fishing is a popular activity east of the hovercraft landing site and conflicts arise between fishers and people mooring boats. To stop these conflicts no beach mooring will be permitted in this area (Figure 4).

Boating has the potential to physically harm people, dugongs and dolphins, and propellers, anchors and chains can damage seagrass beds in shallow waters. Guidelines are needed for approaching dolphins and dugongs, similar to CALM's whale watching guidelines, to ensure these animals are not harmed. The danger is accentuated because dolphins are accustomed to the research vessels approaching closely, making them less wary of boats.

Currently boat owners do not pay entrance fees to use the boat ramp or go through the entrance toll gate, which does not allow Rangers to inform them on boating etiquette in the area and the various management zones that exist. Providing this information before boats are launched is important to protect dolphins and dugongs, visitors, seagrass banks and to preserve Monkey Mia's values.

Certain watersports, such as skiing and jet skis, can hurt people, dolphins and dugongs and harm seagrass beds. In addition, these activities are not compatible with the atmosphere of Monkey Mia due to their noise and speed. Some people also have concern over sailboards and surfcats colliding with dolphins and dugongs. These craft are very fast and quiet. No collisions are known to have occurred and current numbers are unlikely to cause problems for other visitors. It would appear, therefore, that given current numbers these vessels can be used safely outside the Dolphin Interaction Area, although the situation should be monitored.

The hire of any water craft that may cause significant congestion and conflicts for users is a cause for concern. It is crucial that any application for such an operation is carefully examined to ensure the Monkey Mia's recreational values are maintained (Section 5). Given that space adjacent to the current facilities is limited it is proposed that any

additional water-based commercial operations would occur in a small area in front of the caravan park and to the west of the caravan park in two 'commercial activities areas' (Figure 4). The areas are suitable landing sites, and activities in these areas will not affect the dolphins.

Recommendations

1. Contact and inform boat users about boating regulations and guidelines for approaching dolphins.
2. Investigate establishing fees to recover the cost of providing beach mooring facilities.
3. Prohibit boating in the Dolphin Interaction Area without restricting access by professional fisherman to all sides of the jetty.
4. Establish a beach mooring area specifically for overnight visitors, and provide and maintain 30 fixed beach mooring points (Figure 4). Private moorings will not be allowed.
5. Establish a beach mooring area for professional fisherman, commercial operations and day visitors, east of the jetty (Figure 4).
6. Prohibit beach mooring in the "no moorings" area (Figure 4).
7. Monitor the use of boats to ensure that boating is not detrimental to dolphins or visitors or congests the beach or waters.
8. Consider controls on jet skis and water skiing on the waters adjacent to Monkey Mia Reserve, in the preparation of the Shark Bay Marine Reserves Management Plan.
9. Provide information for boat users on safety requirements and boating ethics as they pertain to the waters adjacent to the Reserve.

5.4 SHELL COLLECTING

Shell collecting is a popular activity that does not affect Monkey Mia values provided that only dead shells are collected. This excludes the collection of cockles.

Recommendation

Allow dead shells to be collected.

5.5 WALKING

While bushwalking is a passive activity it has potential, if unregulated, to damage fragile ecosystems, especially when large numbers of people are involved. This is the case at Monkey Mia, particularly in the foredunes and the red sand dunes adjacent to the caravan park, where unguided walking erodes vegetation. Walking can be an important educational activity and an enjoyable addition to the range of activities at Monkey Mia, and should be encouraged. However, trails need to be constructed to protect fragile areas from degradation. Such trails may be to Aboriginal sites, the gravesite, oceanic lookouts, various landforms, bird roosting areas and the Thick-billed Grasswren habitat. A new walk trail leading to these features is currently under construction.

Recommendation

Construct further interpretive walk trails to highlight the Reserve's various cultural and environmental features, in accordance with the Master Development Plan (Section 4).

5.6 PETS

Dogs have been reported causing distress to dolphins in the shallows, and the potential to transfer disease from dogs to dolphins exists. This is not acceptable, dogs could injure a dolphin or frighten it away from the beach. Dogs can annoy other users and defaecate in public areas. For these reasons dogs will not be allowed in, or adjacent to the Dolphin Interaction Area. Dogs on a leash will be permitted on the remainder of the Reserve.

Recommendation

Allow dogs on leashes except for the Dolphin Interaction Area and the adjacent beach.

5.7 RECREATIONAL FACILITIES

5.7.1 Day-Use Sites

Day-use visitors are those people who visit the area to see the dolphins, or to go boating, fishing and use its sheltered facilities. Facilities such as barbecues, tables, shelters, grassed areas and information, are provided. Bus and coach groups require shelters for their customers, especially during summer.

In addition to the Monkey Mia site, the Reserve contains other sites which visitors use. Red Bluff is used for camping and day use, even though camping is not legally permitted. The site can be developed for day use, providing an additional attraction within the Reserve.

Gas barbecues are preferred to wood because of the problem of collecting fire wood and the potential for fire to escape.

Recommendations

1. Delineate recreation sites and support facilities on a Master Development Plan for the Reserve (Section 4). Submit proposals for recreational facilities to the Management Committee for its approval.
2. Provide for controlled day use of the Reserve including the Red Bluff area.
3. Consider the installation of gas barbecues in the Reserve; wood fires will be prohibited.
4. Ensure that all facilities and structures are sympathetic with the Reserve's environment.

5.7.2 Access for Disabled Visitors

Disabled access is provided to the Dolphin Information Centre and to the jetty where the dolphin interaction can be viewed. Providing access to the beach for disabled people should be investigated.

Recommendations

1. Maintain disabled access to the jetty and the Dolphin Information Centre from the carparks, and access to the caravan park from the Dolphin Information Centre.
2. Investigate and, if practicable, provide for wheelchair access to the beach.

6.0 CONSERVATION

6.1 CLIMATE

The objective is to consider the effects of climate in all aspects of planning and operations in the Reserve.

Monkey Mia experiences hot, dry summers and mild winters with minimum and maximum temperatures ranging between 20°C and 35°C in summer and between 10°C and 20°C in winter. Based on average annual rainfall in Denham and Carnarvon, Monkey Mia Reserve could expect an annual rainfall of around 200mm with approximately 80 percent of this rain falling in winter. The area experiences southerly winds for most of the year, and in summer winds in excess of 25km/hr can blow for several days. In general, winter winds are lighter and more variable being predominantly south-easterly. The Monkey Mia beach is on a northerly facing shoreline, protected from southerly winds. Monkey Mia is a popular boating and recreational area due to the shelter it affords.

The hot and windy summer months are not favoured by visitors, thus creating a seasonal downturn in visitor numbers. In contrast the winter months are very popular, placing more pressure on facilities, natural resources and staff.

Cyclones are experienced infrequently, however winds of 70-110km/hr can be generated, with gusts up to 180km/hr.

Issues

- Current facilities do not cater for climatic extremes.
- The area infrequently experiences cyclones.

Recommendations

1. Locate and design recreational facilities to ensure visitor comfort and safety during a full range of climatic conditions.
2. Design structures to withstand cyclones.

6.2 GEOLOGY, LANDFORMS AND SOILS

The objective is to protect and conserve geological features, landforms and soils.

The Reserve is dominated by unconsolidated red dunes composed of quartz sand, which overlay the Peron Sandstone. These adjoin white quartz sand dunes that form a strip between the red dunes and the beach. This occurs for the whole Reserve except for a section known as Red Bluff. Here the red dunes meet the coast directly forming a short

steep cliff. The Peron Sandstone breaks through the overlaying sands at several points in the Reserve, the most noticeable being the small caves close to Monkey Mia. The area is generally undulating with a maximum elevation of approximately 30m above sea level.

Issues

- Soils of the Reserve are susceptible to wind and water erosion if the vegetation cover is removed.
- Active erosion is occurring at Red Bluff.

Recommendations

1. Minimise clearing for facilities, roads or trails to retain vegetation cover. Rehabilitate degraded areas, with priority for physically and visually sensitive foredunes and cliffs.
2. Rehabilitate eroded areas at Red Bluff.

6.3 VISUAL LANDSCAPE

The objectives are to:

- **Conserve the Reserve's visual landscape values.**
- **Plan and implement all management activities to complement the positive visual qualities of the Reserve and surrounding landscapes.**
- **Restore visually degraded landscapes.**

The Reserve's arid landscapes and welcoming seascapes contribute to a significant visual resource. The coastline and diversity of landscape features, such as the stark white shoreline, red cliffs, beaches and low lying vegetation define the area's particular scenic values.

Visual landscape management in the Reserve involves maintaining, restoring or enhancing the landscape (including landform, vegetation, waterform), and planning and designing land-use activities and developments so as to provide diverse views in a natural setting. Human-imposed changes to the landscape should be subordinate to the established natural visual character. The desired outcome is a positive response and sense of place for the Reserve's visitors and local residents.

Visual landscape management ranges from broad scale to site specific analysis, and includes sensitive planning, design and construction.

Issues

- Developments on the Reserve need to respect the visual values of the Reserve and surrounding area.
- Some previous activities have resulted in impacts on the Reserve's visual values.

Recommendations

1. Ensure that developments, landuses and management activities do not adversely impact on the Reserve's landscape values.
2. Restore visual character where this has been degraded through past activities.

6.4 WATER QUALITY

The objectives are to:

- **Manage activities and development at Monkey Mia to minimize any adverse affects on water quality in the adjoining waters.**
- **Monitor water quality and hydrological processes to maintain dolphin and public health.**

To maintain a healthy environment for both visitors and dolphins, the quality of the adjoining sea water must be maintained. Activities on the Reserve have affected water quality in the past. These activities need to be managed responsibly to prevent further degradation of water quality.

The effect of contaminants on water quality is influenced by water movement and the ability of the marine system to flush out contaminants. The Monkey Mia lagoon contains shallow banks that may be exposed at low tide. This restricts water movement and can result in decomposition of dead seagrass matter in summer, resulting in an unpleasant smell. It is not known whether this has any effect on dolphin health.

Potential contaminants include leachate from sewage systems, harmful chemicals, fertilizers and hydrocarbons, which all have the potential to affect water quality and dolphin health. The health of the public could also be affected if high levels of bacteria occurred in the waters. Concern over water quality led to an investigation by the Environmental Protection Authority in 1989, indicating abnormally high concentrations of nitrogen and significant contamination by faecal bacteria. The cause of these high levels was believed to be the sewage disposal system, which consisted of septic tanks and leach drains close to the beach and Dolphin Interaction Area (Environmental Protection Authority 1989).

Remedial action was taken immediately by sealing the septic tanks and constructing a leach drain approximately 1km inland. Effluent (including sewage waste water) is now pumped to this point from the caravan park and the public ablution block.

To examine the effectiveness of this change further water sampling was carried out by CALM in August 1989 and again in February 1990 (Stoddart 1990). The analysis found that nitrogen levels had reduced significantly, indicating that leaching of waste water could have caused the high levels. Bacteria in the form of faecal coliforms and faecal streptococci actually increased above the original figures in the August test, but decreased in the February sample to lower than the EPA's results.

Because of the limited sampling it is difficult to properly assess the results and draw conclusions. A comprehensive 12 month sampling program was undertaken in 1991/92, and the results are currently being assessed. Monitoring programs are funded from the Monkey Mia Reserve Trading Account.

Harmful chemicals may include herbicides, pesticides or any other substance used on the land or waters adjoining Monkey Mia. It is essential that the Management Committee is aware of any proposal to use chemicals near Monkey Mia in order to assess likely impacts of the particular chemical, and to seek methods to minimize impacts.

Fertilizers are used on the lawns and gardens of the caravan park and the Reserve to promote growth. The movement of nutrients through the soil is related to the rate of water application. Given the proximity of these to the water, it is essential that use of fertilizers is controlled to avoid eutrophication through the addition of phosphorous and nitrogen to the system. Monitoring of fertilizer use and monitoring of water quality will show whether this is a factor in degrading water quality. The choice of species adapted to low fertility sites will minimize fertilizer requirements.

Issues

- Water circulation in the bay is limited by shallow waters, particularly with low tides.
- Very low tides in the summer months can cause the accumulated seagrass to decompose, resulting in an unpleasant smell. The effect of this decomposing matter on dolphin health is unknown.
- Sewage, harmful chemicals, fertilizers and hydrocarbons all have potential to pollute the waters of Monkey Mia and subsequently affect dolphin and/or public health.
- To accurately interpret water sampling results, information on water circulation in the adjoining waters is required.
- The potential exists for leakage from the sewage system at peak times if the pumping system fails.
- Tidal forced exchange between the ground water and the ocean extends a considerable distance inland.

Recommendations

1. Develop and implement a water quality monitoring program.
2. Ensure that adequate backup procedures and contingency plans are in place to cope with a failure of the sewage disposal system as a result of mechanical failure or human error.
3. Refer to the Management Committee requests for use of any potentially hazardous chemicals at the Monkey Mia Caravan Park.
4. Minimise fertilizer application and monitor the current regime, including watering rates, in conjunction with water quality sampling. If results show an unacceptable level of phosphorous and nitrogen in the system then alternative methods or products will need to be investigated and put into place.
5. Inform the public about the natural decomposition of seagrass.

6.5 FLORA AND VEGETATION

The objectives are to:

- Protect and conserve vegetation communities, including their structure, diversity and distribution.
- Protect and conserve indigenous flora with an emphasis on any rare, threatened or priority species.

The Monkey Mia Reserve is in the Carnarvon Botanical District (Beard 1976). Four landform units are found on the Reserve - white coastal dunes, coastal sandplain, red sandplain and saltpans or birridas.

Red Sandplain - this is the dominant landform of the Reserve, comprising approximately 80% of the land area. The vegetation is dominated by *Acacia ramulosa*, a spreading shrub that can attain a height of 3m. Associated species detailed by Beard include:

- large shrubs - Limestone wattle (*Acacia sclerosperma*), *A. tetragonophylla*, *Exocarpus sparteus*, Red Mallee (*Eucalyptus oleosa*), Orange Grevillea (*Grevillea eriostachya*), Bullock Bush (*Heterodendrum oleaefolium*.)
- small shrubs - *Dodonaea inaequifolia*, *Eremophila platycalyx*, *E. oldfieldii*, *Labichea cassioides*, *Melaleuca aff. nesophila*, *Scholtzia umbellifera*, *Triumfetta appendiculata*.
- climbers - *Boerhavia chinensis*, *Marsdenia australis*, *Stipa elegantissima*.
- ephemerals (seasonal species) - *Podolepis canescens*.

Coastal sandplain - the coastal sandplain is generally a white sandy flat area located between the coastal dunes and the red sandplain. The vegetation is dominated by *Acacia sclerosperma*, *Scholtzia* spp. and *Rhagodia preissii* with some small depressions containing *Halosarcia* spp., *Frankenia pauciflora* and *Sporobolus virginicus* (Brooker 1988).

Coastal dunes - the dunes form a narrow strip adjacent to the beach, running along the eastern shoreline and halfway along the northern shoreline, and consist of sparse shrubland and spinifex. The dunes are dominated by *Acacia sclerosperma*, *Spinifex longifolius*, *Halosarcia* spp. and *Sporobolus* spp. (Brooker 1988).

Saltpan - only one birrida (saltpan) occurs in the Reserve, located near the western boundary. It contains saltbush, samphires (*Halosarcia* spp) and Seaheath (*Frankenia pauciflora*).

There are no declared rare flora on the Reserve, nor species on CALM's priority flora list.

Certain areas of the Reserve are degraded, including adjacent to the dam, the birrida on the western edge of the Reserve, Red Bluff, the coastal sandplain to the west of the caravan park, and amongst the coastal dunes.

Issues

- The Reserve's vegetation is sensitive to disturbance.
- Various areas of the Reserve are degraded.

Recommendations

1. Protect flora and vegetation, and minimise disturbance to habitats.
2. Rehabilitate degraded vegetation in the Reserve.
3. Provide interpretive material on natural communities of the Reserve, including the Reserve's flora and vegetation.

6.6 FAUNA

The objectives are to:

- **Conserve native fauna populations.**
- **Provide special protection to threatened and restricted species of fauna and their habitats.**

Comprehensive surveys have been carried out on Monkey Mia Reserve for birds, but not for mammals, reptiles and amphibians. The Thick-billed Grasswren (*Amytornis textilis*) is the only species on the Reserve that is declared threatened under the Wildlife Conservation Act. The Peron Peninsula represents the major stronghold for the species, and Monkey Mia supports a particularly dense population of 2-3 birds per hectare compared with 2 birds per 4-5 hectares in South Australia (Brooker 1988). This high density (possibly due to the presence of a dam) indicates the Reserve is an important site for the species and, therefore, protection strategies need to be developed.

Native mammals known to occur on Peron Peninsula are the Common Dunnart (*Sminthopsis dolichura*), Euro (*Macropus robustus*), Spinifex Hopping-Mouse (*Notomys alexis*), Sandy Inland Mouse (*Pseudomys hermannsburgensis*), Greater Long-eared Bat (*Nyctophilus timoriensis*) and the White Striped Mastiff Bat (*Nyctinomus australis*) (Baynes 1990). A small population of Euros occurs on the Reserve. However, it is not known what other species occur.

Marine mammals found in the adjoining waters are the Bottlenose Dolphin (*Tursiops truncatus*) and the Dugong (*Dugong dugon*). The latter is declared under the Wildlife Conservation Act to be in need of special protection.

Issues

- Off road driving, firewood collecting and fires all affect either vegetation structure or diversity, and are likely to reduce the suitability of the area for the Thick-billed Grasswren.

Recommendations

1. Protect fauna and minimise disturbance to habitats.
2. Maintain the dam but prevent access by feral species (Section 6.9).
3. Provide interpretive material (Section 9.1) and opportunities for the public to view native fauna.

6.7 DOLPHIN MANAGEMENT

Responsible management of the Monkey Mia dolphins is crucial to protect the Reserve's conservation and economic values. Managing and protecting dolphins can be split into two activities, interaction management and feeding.

6.7.1 Interaction Management

The objective is to manage the interaction between dolphins and people to protect the dolphins and to preserve the quality of visitor's experience.

Human-dolphin interaction is a phrase that describes the meeting of humans and dolphins that come into the shallows of Monkey Mia. The observing, touching and feeding that occurs is defined as 'interaction'.

The dolphins may approach the beach at any time during the day, although this is more likely to occur in the mornings. Of approximately 250 dolphins that make up the offshore population in Marine Park waters ranging within about 10km of Monkey Mia, 5-8 would be considered as 'regular' visitors to the shore, with about another 20 being infrequent visitors. The 'regular' dolphins frequent the beach on most days, although individuals may be absent for periods during the summer breeding season.

Dolphin visits to the inshore areas vary with the season, tides and natural activities, such as mating, birthing, social interaction and herding. A major cause for the absence of 'regular' female dolphins is due to 'herding' by coalitions of males. Other events such as cyclones may affect their presence. Records of the 'regular' dolphins from 1989 show that their visits (hours/month) follow a seasonal pattern, characterised by a low number of visits between December and February, with February being the lowest. Visits increase steadily, peaking in May (highest), June and July before decreasing again.

Interaction can occur from boats or along the shoreline. However, the dolphins generally approach the beach adjacent to the Dolphin Information Centre, as this is traditionally where they have been fed. It is crucial for the protection of the dolphins that this

continues to be the focus of interaction to allow supervision by Rangers. Additionally this allows other activities to be controlled in order to protect the dolphins.

Currently a Dolphin Interaction Area (gazetted in December 1988) exists in waters which are closed under the Western Australian Marine Act 1982. The waters are closed to navigation by all craft to protect dolphins from injury and to minimise disturbance to visitors in the interaction area. Swimming also is not permitted. The Closed Water notice does not conform with the area at which feeding and interaction commonly occur. Given increasing visits and associated congestion the area is considered insufficient to properly protect the dolphins and to encourage them to come inshore.

Situations where crowds of up to 200 people congregate on the beach to meet the dolphins have the potential to cause stress to the dolphins if not managed effectively. Visitor management comprises two important components - visitor awareness and supervision. In general, visitors are unaware of how to interact with dolphins without causing stress to the animals and require guidance from staff. The recommendations outlined in Section 9.1 aim to provide information to improve the awareness of visitors.

Supervision of interaction is essential, especially given the size of the groups that congregate on the beach at peak visitor periods. Without supervision, dolphins can be injured or stressed, which could result in the people being hurt. While not considered necessary at this stage, future options to control visitor numbers need to be discussed. Some possible options include limiting the time people interact with the dolphins, length of stay or setting a carrying capacity for Monkey Mia whereby visitors may need to book to reserve an entry permit. Another method may be to encourage visitors in the off season.

Issues

- Dolphin visits vary with the season, tides and natural social activities, and may be affected by other natural events (for example cyclones). Dolphin visits are highest in winter, and lowest in summer.
- Summer visitors may be concerned or disappointed by the lack of dolphins visiting inshore.
- The high number of dolphin visits during winter coincides with peak visitor numbers, placing extra pressure on Ranger staff.
- The current Dolphin Interaction Area (closed waters) is inadequate.
- Control of visitor numbers may be necessary in the future to preserve the quality of experience and to protect the dolphins.

Recommendations

1. Enlarge the Dolphin Interaction Area by extending the waters closed to navigation by any craft from the end of the jetty west for 150m to a point 40m offshore from high water mark in the Mooring Area (Figure 4). Close the eastern half of the area to swimming. Access to and from the jetty by commercial fishing vessels will not be restricted.

2. Allow dogs on leashes except for the Dolphin Interaction Area and the adjacent beach.
3. Encourage people to visit Monkey Mia outside traditional peak periods.
4. Monitor visitor numbers and control if necessary to preserve the quality of the experience and to protect the dolphins.
5. Review dolphin interaction procedures and inform the public through information and interpretation materials.

6.7.2 Dolphin Feeding

The objective is to ensure that dolphins remain wild animals and retain their social structure and natural foraging abilities.

Dolphins were originally attracted to the shallows at Monkey Mia by fishers who fed them from their catch by hand. At this stage few people were involved and feeding was the major attraction for the dolphins. After the opening of the caravan park in 1975 visitors increased gradually, and hand feeding continued. In 1981 frozen fish from Perth was sold to the public, which caused a significant change to the feeding pattern. The dolphins now had a constant supply of fish all year round which resulted in greater numbers visiting Monkey Mia. The feeding situation remained the same until 1987 when freshly caught local fish were substituted for frozen fish.

Increasing numbers of visitors resulted in constant pressure from visitors for more fish to allow everyone the opportunity to feed the dolphins, and the increasing amounts being offered caused concern over possible dependency and nutritional deficiencies. Researchers at Monkey Mia believed that the increase in feeding was causing abnormal behavioural changes during mating.

At this stage some dolphins were receiving up to 5kg per day, their total daily requirements. Overall up to 35kg of fish was being used each day. In September 1987 the total fish allowance was reduced to 21-28kg per day and was further reduced in June 1988 to 15kg per day.

In February 1989 the sale of fish ceased, with the 15kg per day being handed to the public by Rangers to be offered to the 5-8 'regular' dolphins. Following further discussion and specialist advice, the Management Committee adopted a feeding strategy based on providing 2kg per day for each dolphin on average over a month, independent of its physiological state. Additional amounts would be available if a regular dolphin had been away for a few days. This strategy was based on providing one third of the dolphins average daily consumption, estimated to be around 5-6kg, and the dolphin foraging for two thirds of its intake, which reduces the likelihood of dependency occurring and ensures proper nutrition is maintained. Unsupervised feeding from boats or from the shore makes fish consumption impossible to accurately identify and, therefore, makes it difficult to manage a feeding strategy. This unknown quantity needs to be identified to accurately assess consumption and, if possible, stopped.

While feeding was the initial impetus for dolphins to come inshore at Monkey Mia and is undoubtedly a very significant attraction for dolphins, interaction with people is part of the attraction. Subsequent offspring from the original 'regular' dolphins appear to visit inshore habitually. Dolphins often refuse fish offered by people and sometimes stay inshore even when they are not interested in consuming fish. These habits indicate that feeding is not the dolphins' only interest.

Fish quality, species and hygiene are important to ensure that feeding the dolphins will not affect their health. Fresh fish are considered superior to frozen because freezing dries out the fish (dolphins rely on fish to provide their metabolic water requirements) and destroys significant amounts of fat soluble vitamins. While fresh fish is preferable, frozen fish is an adequate substitute where fresh fish is not available. Frozen fish should be thawed in fresh water.

Fish should be prepared under strict hygiene conditions to ensure that harmful bacteria are not passed onto the dolphins. Hygiene guidelines prepared by CALM are currently practised and reviewed periodically.

The species offered to the dolphins should be varied frequently and where possible this should be in conjunction with the seasonal abundance of the particular species.

The timing of feeding has caused some debate as to whether feeding should occur at regular times or at random. The random method is considered more appropriate because this prevents conditioning the dolphins to come inshore at particular times, and therefore retains a "wild" element rather than becoming a "staged act".

Issues

- The pattern of feeding over the last 25 years has been highly variable and records have until recently been poor or non-existent, making the impacts of changes in feeding rates hard to assess.
- Since introducing the 2kg per day regime, there has been no significant reduction in the number of dolphins visiting Monkey Mia.
- Feeding from boats could result in dolphins being injured, makes it difficult to assess the food intake, and may attract dolphins away from the shore.
- Fish species, quality and preparation are important in maintaining dolphin health.
- Maintaining the special Monkey Mia experience depends on the dolphins being perceived as a wild population rather than as tamed dolphins. Feeding strategies will affect this perception.
- Accurate assessment of fish consumed and associated dolphin visits are required, which means all feeding must be supervised by Rangers.
- The availability of food is a significant reason why the dolphins come inshore, so feeding is required to maintain the special interaction experience.

Recommendations

1. CALM will regularly review the feeding strategy for the dolphins and recommend changes to the Management Committee as required.

2. Monitor the amount of fish being given and the number of hours each dolphin visits Monkey Mia.
3. Permit supervised feeding inside the Dolphin Interaction Area. Feeding times will be random and no boat feeding will be permitted.
4. Supply fresh fish from local sources and vary the species when they are available.
5. Maintain hygienic fish preparation.

6.8 SILVER GULLS, PELICANS AND CORMORANTS

The objectives are to:

- **Manage Silver Gull, pelican and cormorant numbers to minimise negative effects.**
- **Use the presence of these birds for educational purposes.**

The development of Monkey Mia has caused an abnormal increase in certain local bird species that have been favoured through human presence. This increase poses problems for managing the Reserve, and could cause changes in local bird distribution and numbers.

People feed Silver Gulls (*Larus novaehollandiae*) at a number of locations at Monkey Mia, including on the lawns adjacent to the cafe. Gull numbers have increased dramatically even though signs have been erected to discourage feeding. While the birds entertain visitors they are noisy, messy and sometimes aggressive.

Silver Gulls will feed on food scraps and rubbish tips, a practice that can spread salmonella bacteria. This is of concern to the health of people and dolphins at Monkey Mia, especially if gull numbers continue to increase. Increased numbers also have the potential to alter the local bird ecology by out competing other species for natural food sources and breeding sites. Silver Gulls are also known to kill chicks of other species at breeding sites.

The Reserve is also home to pelicans (*Pelecanus conspicillatus*) and Pied Cormorants (*Phalacrocorax varius*) which remain around the Dolphin Information Centre to receive fish handouts. Originally only a few pelicans were residents, however numbers have increased, especially during the breeding season. They are a problem as they attempt to steal fish from people feeding the dolphins. This has reached the point where pelicans and cormorants need to be fed simultaneously with the dolphins, but away from the dolphins to allow orderly feeding to occur. This has the disadvantage of taking up staff time. The birds defaecate in visitor areas and disturb rubbish bins.

Despite their drawbacks, pelicans and cormorants are a popular tourist attraction, provide an added attraction at Monkey Mia, and have some educational benefits. To minimise any undesirable effects, numbers need to be managed.

Issues

- Gulls feed on refuse tips and have the potential to spread salmonella (which can cause food poisoning).
- Gulls are noisy, messy and can be aggressive. They could also affect other local bird species by competing for food and breeding sites, and through predation of nestlings, if numbers increase significantly.
- Pelicans and cormorants cause problems with dolphin feeding and take up staff time. Numbers are increasing, and birds defaecate in public areas.
- Birds can currently get into open bins and feed on food scraps.

Recommendations

1. Design all bins to prevent birds from getting food scraps. Provide offal bins near fish cleaning tables (outside the Dolphin Interaction Area) to limit food sources for Silver Gulls.
2. Erect appropriate signs and provide information to discourage the feeding of gulls.
3. Monitor Silver Gull, pelican and cormorant numbers to determine the need for control measures.
4. Minimise feeding of pelicans and cormorants.
5. Provide information on the ecology of Silver Gulls, pelicans and cormorants.
6. Implement additional methods to discourage gull feeding.

6.9 FERAL ANIMALS AND WEEDS

The objective is to control feral animals and weeds that threaten the Reserve's values.

The Reserve contains the feral cat (*Felis catus*), rabbit (*Oryctolagus cuniculus*), fox (*Vulpes vulpes*), house mouse (*Mus musculus*) and occasionally sheep and goats. These introduced animals have had a major impact on the native ecology through grazing native plants, spreading weeds and by preying on native animals. It would not be feasible to eradicate these animals given that the Reserve could be recolonized quickly from neighbouring lands. If, however, a control program is carried out on the adjacent Francois Peron National Park and the southern half of Peron Peninsula, then it would be sensible to include the Reserve in this program as it is relatively small and the cost would be limited. The location of an artificial dam in the Reserve and access to additional food supplies, such as within the caravan park, have caused feral animals and hence weeds to increase. However, it is likely that the local population of the Thick-billed Grasswren is maintained at an artificially high level due to the dam (Section 6.6). Requests in the past for a rubbish tip to be established on the Reserve or nearby have been denied by the Management Committee.

Being an area that has been grazed some weed species are present. Doublegee and calthrop seeds can cause considerable discomfort for visitors on the walk trails.

Issues

- Providing an artificial dam has attracted feral animals.
- Control programs on feral animals in isolation from adjacent lands are impractical.
- Foxes and cats are not believed to greatly affect the rare Thick-billed Grasswren.
- A control program for all feral animals on Peron Peninsula may occur in the next five years. A goat control program is currently operating on Francois Peron National Park.
- Weeds are not currently a major environmental problem, however, some species, for example doublegee and calthrop, may cause discomfort to visitors and animals.

Recommendations

1. Discourage feral animals and gulls by removing all rubbish produced at Monkey Mia to the Denham tip, or an alternative site at least 10 km from the Reserve.
2. Monitor feral animal numbers and species in the Reserve and institute a control program if funds are available. Include Monkey Mia in any control program carried out by CALM on the Peron Peninsula.
3. Control weeds in facility areas if they cause visual problems or visitor discomfort.
4. Monitor weeds for new infestations and control as necessary.
5. Use appropriate fencing to prevent feral animals access to the artificial dam.

6.10 FIRE

The objective is to protect life, property and conservation values on the Reserve from damage or destruction by wildfire.

The Peron Peninsula has been grazed for over a century and fuel loads rarely achieve levels that would sustain fire. Past fires can be located on satellite images, however, the information regarding when these occurred, their intensity and rate of spread is limited.

The destocking of the Peninsula has resulted in a significant increase in vegetation growth that has increased the potential for fire. The risk of fire from natural or human sources in the bowgada (*Acacia ramulosa*) thickets found on the Reserve is historically low.

Very little is known about the effects of fire on the vegetation and fire behaviour in this area. Because of this no fire prevention strategies should be proposed until more information is available on all aspects of fire management.

Issues

- Fire has not been an issue in this area in the past. However, destocking has led to increased growth and increased the risk of fires starting and being sustained.
- Little information is available on fire ecology, behaviour and the effectiveness of fire suppression strategies in the Reserve's vegetation.
- Life and property could be at risk at Monkey Mia should a fire reach the site.
- The Thick-billed Grasswren is at risk if a fire occurs on the Reserve.

Recommendations

1. Develop a fire management plan for the Reserve.
2. Promote public awareness of fire risk, safety and survival through pamphlets, information boards and personal contact by staff.
3. Prohibit wood fires on the Reserve to reduce risks of accidental fires.

6.11 BASIC RAW MATERIALS

The objective is to limit the extraction of gravel, sand and stone to areas where such activities will have minimal impact on Reserve values.

Four excavation sites in the Reserve have been used to remove gravel and landfill. Of these, one gravel pit is still used by the Shire as this resource is scarce in the area. Previously, parts of the Reserve have been used to dispose building rubble and rubbish. The pit is located on the ridge directly east of the facility area and is visible to land and sea visitors. Minimising this scar on the landscape is important in preserving the Reserve's scenic amenity. No mining tenements are held over the Reserve.

Any clearing or excavation for other purposes could result in the Thick-billed Grasswren's habitat being destroyed as well as eroding sensitive landforms. Therefore, any proposal should be considered carefully.

Issues

- Gravel is continually needed in the Reserve, primarily for road maintenance.
- The extraction of gravel, sand and stone can have negative impacts on Reserve values.
- The main gravel pit at Monkey Mia, which is an important source for the area, is in a visually sensitive location.
- Old pits have been used for dumping rubbish and are not rehabilitated.
- Further clearing may have impacts on conservation and landscape values, in particular, the Thick-billed Grasswren's habitat.

Recommendations

1. Level all disused pits as close as possible to the natural landform and rehabilitate with local species, and bury or remove rubbish. This should be to Management Committee standards.
2. Permit gravel extraction in the north-western part of the Reserve subject to the development of a pit plan by the Shire which addresses the issues of landscape management and rehabilitation. The plan will aim to direct resource removal to pit faces not visible to Reserve users and to repair the visible scar. The pit plan will require approval of the Management Committee.
3. Assess the likely impacts of other proposed resource exploitation activities on the Reserve's values.

7.0 CULTURAL RESOURCES

The objective is to protect and conserve Aboriginal and European cultural values of the Reserve.

7.1 ABORIGINAL HERITAGE

Research has been carried out on the Reserve's Aboriginal sites, including midden sites, quarries, rock shelters and artefact scatters. Five sites have been identified in the Monkey Mia Reserve. Excavation and dating of the two rock shelters at Monkey Mia indicate that the Reserve was occupied by Aboriginal people 1000 years ago. These sites are located very close to the shoreline and animal skeletal remains indicate that the people lived predominantly near the sea and harvested food such as crabs and shellfish (Bowdler 1990).

Issues

- Some Aboriginal sites on the Reserve are being damaged unknowingly by visitors.
- All Aboriginal sites and cultural objects in Western Australia are protected under the Aboriginal Heritage Act, 1972.

Recommendation

Protect the Reserves Aboriginal sites and interpret their significance for visitors.

7.2 EUROPEAN HERITAGE

Shark Bay was the site of the first European landing in Western Australia by Dirk Hartog in 1616, and he was followed by Vlamingh in 1697 and Dampier in 1699. It was not until 1803, however, that the eastern part of Shark Bay was explored by Captain Hamelin aboard the *Naturaliste*. His party travelled the waters east of Faure Island and then followed the eastern coastline of Peron Peninsula. This was the first visit by Europeans to the waters of Monkey Mia. Several survey ships travelled past Monkey Mia in the 1800s. However, it was not until 1890 that Monkey Mia was settled by pearlery and given its name (Elliot, unpublished).

On 13 June in that year, a pearler, sought to use a small common at a place he called Monkey Mia to depasture sheep. A newspaper article that year read that Monkey Mia was second only in importance to Freshwater Camp (Denham), having a population of about 135 people (*West Australian*, 27 December 1890).

The pearling industry thrived until the late 1920s when prices fell and the Depression of the 1930s led to depletion of shell stocks and damage to pearl banks by dredging (Hancock 1989). The pearling industry did not re-establish itself until the granting of licenses in 1982. Following the demise of the pearling industry, Monkey Mia's main

industry was fishing. In 1975 a caravan park was established and tourism steadily increased.

The Reserve contains the gravesite of three-year-old Hilda Johnstone who died in 1890 en route to Carnarvon on the barque Niola. She was the daughter of H F Johnstone, the Surveyor General of Western Australia from 1896-1915.

Recommendation

Protect the Reserve's historical sites and interpret their significance for visitors.

8.0 COMMERCIAL OPERATIONS

The objective is to provide for commercial operations compatible with the objectives of this management plan.

Given the major tourist interest at Monkey Mia, there is great demand for a wide variety of services. It is essential that Monkey Mia's unique atmosphere is preserved in order to retain its attraction to visitors. This was confirmed in a survey that concluded by asking for additional comments on Monkey Mia. The most common comment returned was that "the area should remain as is/hope the area doesn't become too commercialised/should not build any more" (WATC 1988). Over-commercialisation could do irreparable damage to its tourist appeal, as well as affect conservation values. For this reason commercial activities on the Reserve will need to be controlled, and approval given to activities that are compatible with the objectives of this plan.

In considering commercial operations, a regional perspective is required to ascertain the demands on Monkey Mia and its suitability for development. The Shark Bay Region Plan addressed development and indicated that Denham become the Region's main service centre, and that: "No further development, apart from that necessary to achieve existing management goals, should occur at Monkey Mia because of congestion and the need to protect the dolphins". The planning process for the Shark Bay World Heritage Area will encourage diversification of recreational experiences throughout the Region.

At present two boat tour operators are working the waters adjoining the Reserve:

- Monkey Mia Pearl operates tours to the pearl lease west of Monkey Mia. The vessel has a glass bottom to view marine life.
- The hovercraft operates a transport service from Carnarvon to Monkey Mia and scenic tours from Monkey Mia during the day.

These operations provide visitors with alternatives to the dolphins and beach activities. They give visitors the opportunity to see other marine life, including dugongs, sharks, turtles, sea snakes, rays and fish. The negative side to these operations is their potential to congest offshore waters, and the visual pollution caused by their promotional signs. The two vessels take passengers to different sites minimising congestion. However, additional vessels could result in conflict.

The beach area east of the caravan park is used for existing recreational and commercial activities. Additional water-based activities on this beach are likely, therefore, to create congestion and cause conflict with existing uses. To accommodate additional commercial uses, a small area is proposed west of the Dolphin Interaction Area, and a larger area west of the caravan park to enable water-based activities to occur without conflict (Figure 4).

Currently each operator displays a 'sandwich' board to promote its tours. These different sized boards are placed near the jetty and are unsightly. Signs should be confined to a single booth or display panel in an appropriate location.

A wide range of applications for commercial use can be expected. The approval of appropriate commercial concessions will increase the range of recreational opportunities available to visitors, enhancing their stay at Monkey Mia while simultaneously raising revenue for management.

Film makers and photographers are targeting Monkey Mia to make films and documentaries and to film promotional material. The particular objectives for filming will largely determine whether or not it is appropriate for the area. For example, an educational documentary may be appropriate, while certain commercial advertisements may not.

Commercial concessions operating entirely in the marine environment (below high water mark) offshore from Monkey Mia in the Shark Bay Marine Park will be licensed and supervised by CALM.

Issues

- Further developments, such as shops, and providing hire craft would increase congestion.
- Promotional boards for tours are unsightly and occupy valuable space.
- Existing infrastructure (such as carparks and sewage disposal) may be inadequate to cater for further development.

Recommendations

1. All commercial operations will require the approval of the Management Committee. Appropriate conditions will be imposed. Activities that impact adversely on the Reserve's environmental, recreational and cultural values will not be permitted. The effect of any proposed activity on congestion will be considered through reference to the "zoning plan" (Figure 4, Priority Beach Uses).
2. Conditions, fee structure and division of fees for commercial operations that occur on both the Reserve and the Marine Park will be determined through consultation between the Management Committee and CALM.
3. Site additional water- based commercial activities in the Commercial Activities Area (Figure 4). The siting of an operation outside this area will only be considered where this will not cause conflict with existing uses.
4. Investigate options for the relocation of promotional signs and ticket sales from their current locations.
5. The Shire enact By-Laws to regulate commercial, scientific, educational or other non-personal filming on the Reserve and CALM officers be appointed to regulate and enforce the by-law provisions. Filming offshore will require permission from CALM.

9.0 COMMUNITY RELATIONS

9.1 INFORMATION, EDUCATION AND INTERPRETATION

The objective is to enhance visitors' experiences and protect the dolphins of Monkey Mia by providing appropriate information about the Reserve and its values.

Dolphin-human interaction has substantially improved knowledge and appreciation of dolphins and the marine environment, through the appeal and intimacy of the experience. Being able to talk to Rangers, and touch and see the dolphins far outweighs attempts to inform the public through literature and other means, as the experience has the ability to affect values that remain with the visitor. Monkey Mia, therefore, has enormous potential for educating and informing the public on dolphin biology and habits, and on the wider marine environment. Seagrass beds grow in Monkey Mia's marine environment and the area is visited by dugongs. Because of this, and the area's other marine values, Monkey Mia is an ideal place to provide information about marine mammals. Monkey Mia Reserve is also ideal for the interpretation of the arid terrestrial environment adjacent to the marine areas.

Monkey Mia Reserve attracts visitors from a variety of social and ethnic groups. It has the potential to be used to inform and promote awareness of conservation values to a wide range of people with a variety of backgrounds. This potential was acknowledged and resulted in the Dolphin Information Centre, which is run by the Monkey Mia Rangers as part of their duties. This centre contains a room with interpretive facilities including displays, videos, posters and literature. The potential exists to expand and improve these facilities.

Signs are another technique for informing and educating visitors. Ongoing review of sign requirements and design is required.

Informing visitors and expanding their awareness about the Reserve is crucial for protecting the dolphins and to ensuring visitors do not act in a manner that could harm the Reserve's other values. Prior to arriving at Monkey Mia, visitors are generally unaware of how to treat dolphins and providing this information is very important. At present the first point of contact is the entrance box, where visitors are welcomed to the Reserve by Rangers, informed briefly about Monkey Mia and given a pamphlet on dolphins and handling techniques. This personal contact is important as the visitor is informed that the brochure should be read before handling the dolphins. This makes the job of the Ranger at the water's edge easier.

In general, visitors proceed immediately to the water's edge without going to the Dolphin Information Centre, and then on seeing the dolphins venture into the Centre.

The Ranger contact with visitors at the water's edge also provides an opportunity for educating and informing them. This can be difficult at peak times when the size of the crowd makes it difficult to talk to large groups.

Issues

- The Reserve attracts many visitors made up of a variety of age groups, nationalities and interests, some of whom do not speak or read English.
- The dolphin interaction experience is an ideal medium to educate the public on dolphin biology and habits, and marine environments generally.
- Current facilities can be improved to increase the interest and effectiveness of the Centre.
- People generally visit the Dolphin Information Centre after seeing the dolphins.
- Some signs are in poor condition, ineffective and generally do not fit in with the surroundings.
- Personal contact with Ranger staff is a crucial part of the information and education process, and is preferred before people arrive at the water's edge.
- Staff training is an important factor in achieving effective communication and education.
- People going straight to the boat ramp miss out on receiving the information that is pertinent to controlling boating activities.
- The Centre is an important attraction that can reduce the pressure on the interaction area by providing an alternative activity.
- The title of the Centre does not capture its broader role as an interpretive facility.

Recommendations

1. Review interpretive techniques and structural facilities through an ongoing Communication Plan (including information, interpretation and education) for Monkey Mia. Any review and resulting proposals will be considered by the Management Committee.
2. Review existing signs and sign requirements, propose new signs, and produce a sign plan that is consistent with the Information Plan. Liaise with other Government Departments regarding their sign requirements, with the aim of replacing current signs with those consistent with the sign plan.
3. Redesign and expand facilities at the Dolphin Information Centre when capital funds are available. The facility should provide visitors with information before they venture to the water's edge. Consider the provision of a research facility in the expanded centre (Section 11).
4. Encourage interaction between Ranger staff and visitors through contact at the entrance box, beach talks, talks to groups and other interpretive activities and programs. Train staff to carry out these tasks (Section 3.4). Consider the provision of an amphitheatre for guided activities and gatherings.

5. Review and update interpretation and education information as necessary. All promotional or educational materials for the Reserve will identify CALM and the Shire of Shark Bay as joint managers, and will be submitted to the Management Committee for its endorsement.
6. Develop interpretive trails that enhance natural and cultural values and environmental features of the Reserve (Section 5.5).
7. Change the name of the Dolphin Information Centre to the Visitor Centre, in order to recognise its role as an interpretive facility.

9.2 LIAISON AND COMMUNITY INVOLVEMENT

The objective is to seek organisations and individuals to participate in managing Monkey Mia Reserve through the interchange of ideas and the active involvement of the community.

Numerous organisations and individuals have a keen interest in the management of Monkey Mia Reserve. State and Local Government agencies, local residents, visitors and conservation groups all have views concerning the Reserve's management. Liaison is essential to enable Reserve management to be compatible with the objectives and practices of land and water managers in the area and for managers to be responsive to community preferences.

Recommendations

1. Seek compatibility in managing neighbouring lands and the Reserve's waters.
2. Approach individuals and organisations, where considered appropriate by the Management Committee, to provide community input into management decisions.

10.0 UTILITIES

The objective is to minimise the impact of services and utilities on the Reserve's environment and landscape values.

Utilities refers to infrastructure necessary to support Monkey Mia (Figure 5). This includes water, power, waste treatment, telephone lines/towers, roads and jetties.

Currently power is generated by the caravan park and sewage effluent is pumped to leach drains located approximately 1km inland. A Telecom tower is located on the Reserve with two public telephones installed at Monkey Mia. A bitumen road runs from Denham to Monkey Mia, and a Shire jetty is situated at the eastern end of the Dolphin Interaction Area. There is an artesian bore on the Reserve which is utilised by managers of the Reserve and the Monkey Mia Caravan Park.

It is likely that new services and facilities will be required in the Reserve in the future. Any such application needs to be assessed to determine its impacts on the Reserve's conservation, recreation and landscape values. Such impacts should be minimized, and alternatives investigated where potential impacts are significant.

Issues

- Currently services are shared between the caravan park and the Reserve but no formal agreement exists.
- As Monkey Mia continues to get more popular additional or improved services may be required.
- Infrastructure, such as towers, can have major visual impacts.
- The sewage leach drains may need to be upgraded.

Recommendations

1. Refer all applications for utilities in the Reserve to the Management Committee for approval. The approval process will consider the impacts of the proposal and how these can be minimized.
2. Prepare a formal agreement between the caravan park lessees and the Reserve vestees on the shared use of utility services and the artesian bore.
3. The Shire will remain responsible for managing the jetty.

SHARK BAY MARINE PARK

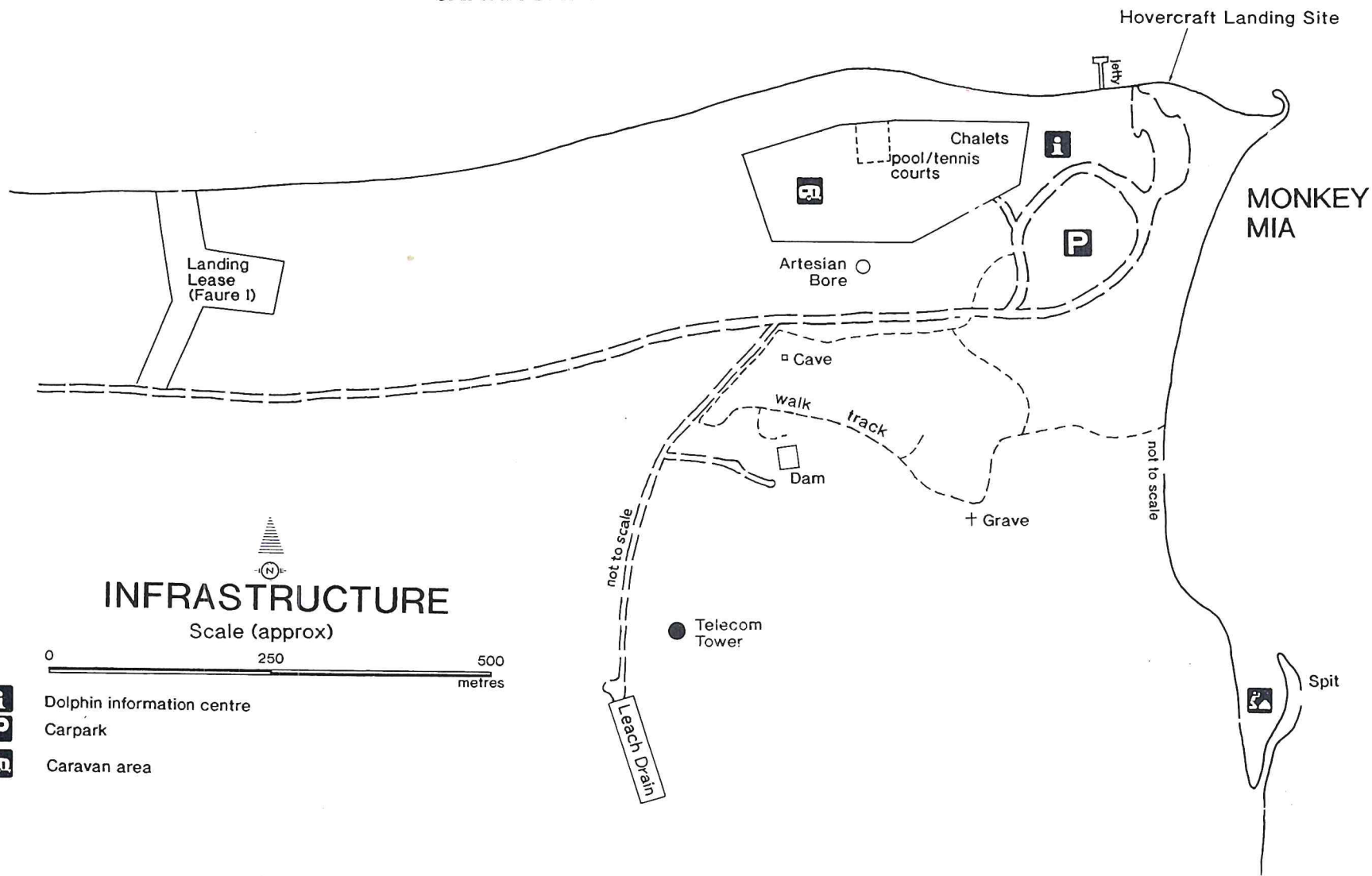


Figure 5

11. RESEARCH

The objective is to encourage and promote research into Monkey Mia Reserve and adjacent lands and waters, biological and social values, and to determine the impact development and management will have on these values.

Researchers were attracted to Monkey Mia in 1982 to research dolphin biology and behaviour. This was possible because the dolphins were accustomed to humans, and allowed researchers to study the social network of the dolphin pods offshore. Since 1984 researchers have spent a minimum of three to four months a year at Monkey Mia, studying both offshore and inshore behaviour. Research has primarily focused on male-male and female-female relationships, infant development and communication.

At present this research is funded by overseas educational institutions. Consequently the Management Committee has not been involved and has had limited access to the results. The potential exists to improve liaison between non-Departmental researchers and CALM, and to focus research on more management related issues and expand the range of research. Dugongs, seagrass ecology, seabird ecology and the Thick-billed Grasswren provide excellent subjects for research.

Issues

- The Management Committee currently has limited input into research at Monkey Mia, and receives restricted feedback on results.
- A great range of research opportunities exists at Monkey Mia that could assist in achieving management objectives.
- Research facilities are limited but could be improved.

Recommendations

1. Forward research proposals to the Management Committee for its consideration. CALM will be responsible for administering and controlling research on Monkey Mia Reserve and the adjacent Shark Bay Marine Park. Give preference to research programs that provide information relevant to the management objectives of Monkey Mia and its dolphins.
2. Investigate the possibility of providing an area suitable for use as a research facility when planning for future development at Monkey Mia. Consider incorporating a research facility in the Dolphin Information Centre when the Centre is redeveloped (Section 9.1).
3. Foster research on the marine and terrestrial biology of Monkey Mia Reserve and adjacent waters. Research projects will be encouraged to provide a public information component.

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