Yalgorup National Park

Management Plan 1995-2005

MANAGEMENT PLAN No. 29

Department of Conservation and Land Management

National Parks and Nature Conservation Authority

YALGORUP NATIONAL PARK

MANAGEMENT PLAN

1995-2005

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for
The National Parks and Nature Conservation Authority

PREFACE

Conservation reserves in Western Australia which, under the CALM Act are specified as national parks, conservation parks, nature reserves and other similar reserves, are vested in the National Parks and Nature Conservation Authority (NPNCA). These reserves are managed on behalf of the NPNCA by the Department of Conservation and Land Management (CALM).

The NPNCA is responsible for having management plans prepared for all lands that are vested in it. These are prepared for a region or for an area. Area plans for individual national parks and nature reserves are being prepared on a priority basis.

These plans are prepared by CALM and issued as draft plans by the NPNCA for public comment prior to final approval by the Minister. Yalgorup National Park is managed as part of the Swan Region of CALM and within the framework of the Region's Management Plan.

Inclusion of a name on the maps or within the text of this Plan does not necessarily imply approval of the name by the relevant nomenclature authority.

This Plan was endorsed by the Bush Fires Board on November 10, 1994 in accordance with the Bush Fires Act, Section 34 (1 a).

ACKNOWLEDGEMENTS

The Project Team for this management plan consisted of Chris Portlock (coordinator), Aminya Koch and Scott Wood. The larger Planning Team includes the Project Team and Peter Hanly and Steve Dutton. The Planning Team was assisted by Tracy Churchill who advised on new recreational site locations. We would like to thank the Peel Development Commission who contributed financially towards this management plan.

Richard Grant edited the plan and Debbie Bowra typed the document. Alan Clarke and Kate Orr helped with the visitor and neighbour surveys and Trevor Smith and his colleagues recorded the activities occurring in and around the Park between 1988 and 1990. The Project Team thanks all those who have commented on early drafts. They include individuals from:

Planning Branch	CALM	Greg McKay	Bush Fires Board
Recreation Landscape and		Robert Reynolds	Dept. of Aboriginal Sites
Community Education Branch		Dr Jeffrey Turner	CSIRO
Policy and Extension Branch		Michael Rosen	CSIRO
Land Administration Branch		Dr Lee Coshell	Curtin University
Land Information Branch		Malcolm Trudgen	Consultant Botanist
Fire Protection Branch		Ellen Gude	Waroona Shire
Wildlife Protection Branch		Craig McClure	City of Mandurah
Don Spriggins		Yalgorup Advisory Committee	
Peter Henderson		Greg Hester	Harvey Shire
Roger Armstrong		Phil Collins	Waroona Shire
Greg Keighery		James Robinson	Mandurah City
Andrew Brown		Brenton Knott	Scientific Community
Jim Lane		Linda Moore	" "
Stuart Halse		Jenny Constantine	Local Community
Tony Friend		Barry Posetti	" "
Tony Start		Dominic Cataldo	" "
Andrew Burbidge		Elaine Tyler	" "
		Laurie Snell	...." "

We would also like to thank individuals and organisations for their submissions on the Draft Plan.

SUMMARY AND KEY ISSUES

The Yalgorup lakes, as part of the Peel/Yalgorup system, is recognised under the Ramsar convention as a wetland of international importance. In addition to important waterbird habitats, particularly for Shelduck, Musk Duck and Black Swans, the lakes contain benthic microbial communities that form algal mats in most of the lakes and living stromatolites (literally, layered rocks) and thrombolites (literally, clotted rocks) in Lake Clifton. Yalgorup National Park contains some of the few remaining near pristine lakes on the Swan Coastal Plain. The Park has high conservation, scientific and educational values. Increasing pressure from surrounding development, increasing visitor numbers and the Park's shape make it difficult to manage for conservation.

The vegetation complexes of Yalgorup National Park are not well represented in conservation reserves elsewhere in Western Australia. The Park's Tuart/Peppermint stands are mostly in very good condition and are identified as possible sites to reintroduce native animals, particularly the Ring-tailed Possum. The Quindalup, Yoongarillup and Karrakatta Vegetation Complexes are in particularly good condition. These complexes are not well represented in any conservation reserve outside the Park. Yalgorup National Park is also the largest conservation reserve on the Swan Coastal Plain.

Disease, weeds and feral animals are degrading some of the Park's vegetation and affecting the native fauna. Most of the Park's vegetation complexes are low in susceptibility to *Phytophthora cinnamomi* (dieback). However, weed intrusion is a concern because it requires a great deal of resources to control the problem. Feral animal control programs in other parts of the State have had very promising results, and proposed programs for Yalgorup will be developed in conjunction with native animal reintroductions.

The Park has beautiful landscapes and a rich history. **Recreational pursuits** include birdwatching, bushwalking, picnicking, sightseeing, camping and photography. Water-based recreational activities include waterskiing in a gazetted waterski area in the lower third of Lake Preston. Canoeing is also permitted in the lower third of Lake Preston. No water-based recreation is permitted on any of the other Yalgorup Lakes. Driving through the Park to get to the beach for recreational fishing and swimming is often combined with picnicking, barbecuing or camping. New recreational site development including camping, day-use areas and nature walks are planned to recognise the growing population and recreational demands particularly in the northern section of the Park.

Horse riding in the Park is a key issue. A bridle trail that follows road reserves and the Park's outside boundary is planned for. This will enable access for horse riders to the beach and to the longer 10th Light Horse Bridle Trail, while avoiding damage to the Park's environment.

A greater understanding of geochemical processes and hydrologic requirements of the stromatolites and thrombolites is needed to guide catchment management in Lake Clifton.

Another important key issue is to **consolidate the Park's boundaries** to improve conservation of flora and fauna. The areas of State forest to the east of Old Coast Road are proposed for addition to the Park and adjacent local government reserves containing high conservation, environmental or recreational values are also recommended to be added. Complementary management of nearby lands and waters is important for the protection of the Park's values.

INDEX TO ACTIONS

References are shown as the section number followed (in brackets) by the number of the action(s).

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PART A INTRODUCTION

1. OVERVIEW

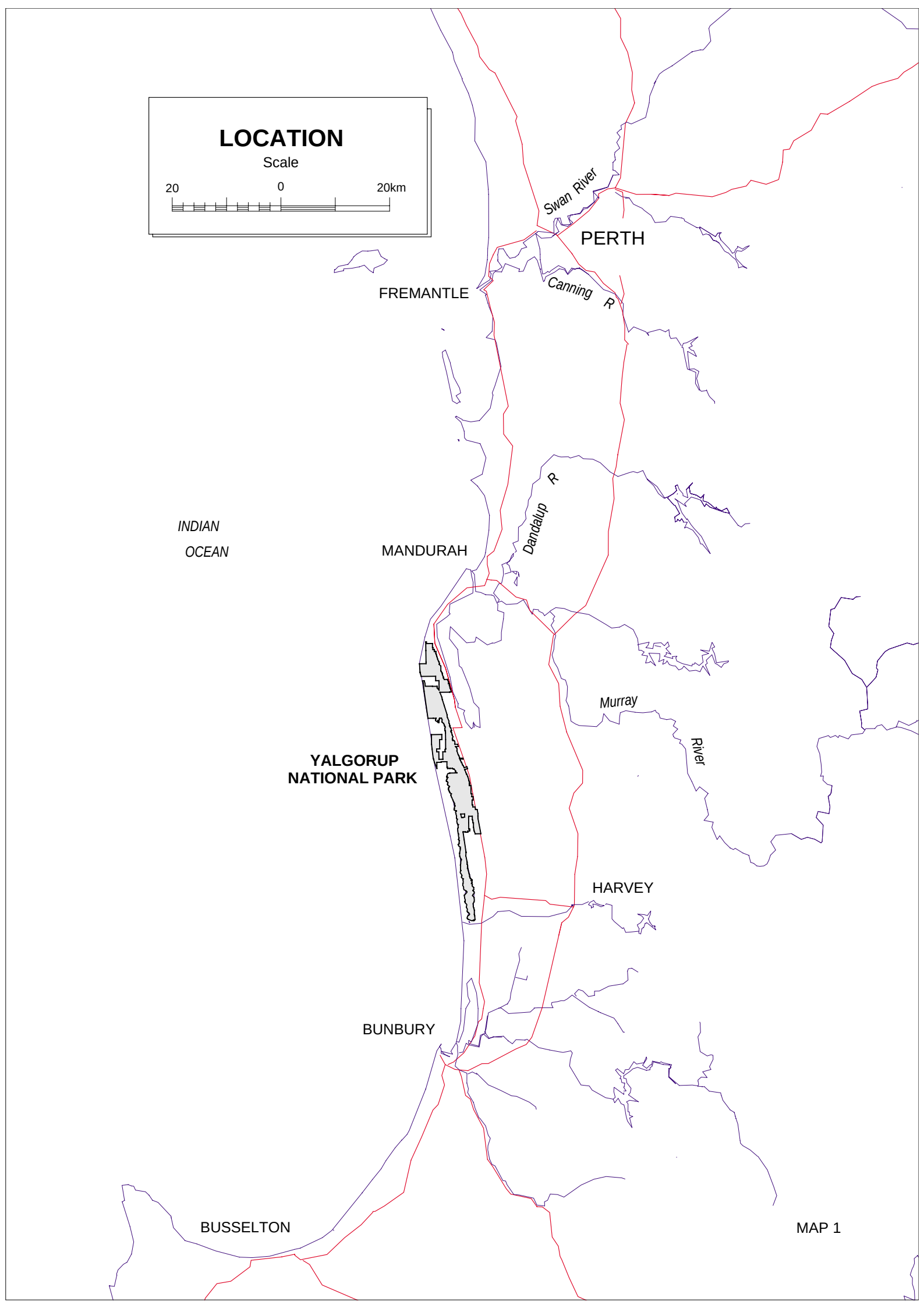
Yalgorup National Park is located on the south-west coast of Western Australia, between Mandurah and Bunbury (Map 1). It consists of several disconnected blocks of land and a chain of long narrow lakes. The Park can be considered as four sections: the White Hill/Tims Thicket area north of Lake Clifton, the area west of Old Coast Road; the area of land surrounding the Martin Tank chain of lakes which connects to a coastal block to the west; and the block south of Preston Beach Road (Map 2). The initial establishment of Yalgorup as a National Park occurred in the early 1970's recognising its values and the need for their protection. It has been registered on the National Estate since 1978 and the area was referred to as early as 1962 in the Academy of Science Report as having important conservation values.

The Peel-Yalgorup System is one of the nine wetland areas in Western Australia recognised as Wetlands of International Importance under the Ramsar Convention. The wetland system is important for migratory waterbirds. The Yalgorup Lakes are recognised internationally by the scientific community for their unique benthic microbial communities and, in particular, for the living stromatolites and thrombolites in Lake Clifton.

Regionally, areas of the Peel-Yalgorup System are crucial conservation components of the proposed Peel Regional Park. Peel Region is one of the fastest growing areas in the State with associated urban development pressures. The Dawesville Channel, just north of the Yalgorup National Park, and the expansion of Mandurah and Bunbury will result in additional population.

A management plan for the Mandurah City Coastal Area and a Rural Study are presently being prepared as part of the Revision of Mandurah's Planning Scheme. The Draft Peel Region Plan and the Draft Bunbury Wellington Region Plan have been released. The Waroona and Harvey Town Planning Schemes and the Preston Beach Coastal Plan (DPUD, 1989) also affect land use and land management in areas that may have an effect on the Park's values. The regional values of Yalgorup National Park, in addition to its wetland ecological values, include vegetation complexes and associated fauna habitats not well represented outside the Park. 'Me Park is important regionally for its conservation, scientific and educational values. Maintaining and promoting these values by sensitive planning in the region will secure long term income from tourism for the region.

Yalgorup National Park is managed by CALM through the Swan Region's Dwellingup District Office. One Ranger is located permanently within the Park.


LOCATION
Scale
20
0
20km
Swan River
PERTH
FREMANTLE
Canning R
Dandalup R
INDIAN
OCEAN
MANDURAH
Murray
River
YALGORUP
NATIONAL PARK
HARVEY
BUNBURY
BUSSELTON
MAP 1

2. COMMUNITY INVOLVEMENT IN THE DRAFT PLAN

Submissions, Surveys and Workshops

- Notices advertising that the Draft Plan was being prepared and inviting early submissions were placed in State and local newspapers.

- Visitor/user surveys were carried out over April/May 1992.
  Key locations within the Park were surveyed by CALM staff and visitor survey boxes.

- Neighbour surveys were carried out over April/May 1992.
  Key locations outside the Park were provided with survey forms and freepost envelopes and forms were also delivered on request to Park neighbours.

- A Community workshop was advertised in local newspapers and interested parties invited to attend. The Community Workshop was held Sunday, August 2, 1992.

- A "Research Needs" Workshop was held on Tuesday, August 11, 1992. The workshop was held to determine the research needs on Lake Clifton and was of a technical nature. Representatives from the scientific community, local, State and Commonwealth government agencies were represented.

- Expressions of interest were called for people to be on the Yalgorup National Park Advisory Committee. The Advisory Committee for Yalgorup National Park was established to advise on the preparation of the Draft Plan.

Other Public Participation

- Discussions were held with interested individuals and groups.

- Talks were given to interested groups and subsequent comments received.

- Local, State and Commonwealth government officers were consulted.

- Written submissions from a number of groups and individuals were received before the Draft Plan was prepared.

Community group and individual contributions were used to prepare this Management Plan.

Community Workshop Issues and Management Plan Recommendations

A community workshop was held on Sunday, August 2, 1992, at Falcon, as part of the program to involve the community in preparing the draft management plan for Yalgorup, National Park. A number of organisations and individuals involved or interested in the Park were invited to attend.

management of the Park?" Each person wrote a private list of issues. Each group was then asked to choose six major issues and present them to the rest of the workshop. Table 1 summarises the issues most frequently included in the issue lists of the groups.

TABLE 1. COMMUNITY ISSUES

Issue	Group					
	1	2	3	4	5	6
Access						
Natural Environment Protection						
Fire Control						
Signs/Information						
Flora/Fauna Protection						
Staffing						
Facilities						
Weed Control						
External Impacts						

Access

Access to the Park is by foot, bicycle, boat, four wheel drive and two wheel drive, all of which contribute to a range of experiences for Park users. The range of access will remain. Access is a controversial issue for the community as some people feel there is enough access and others would like more. It is proposed to increase the number of nature walks, and a new track is proposed in the Park to increase access. The community will be made more aware of correct four wheel drive techniques through signposting. Access will be provided for in the Park for horse riders.

Natural Environment Protection

The community expressed concern about the quality of groundwater and water in the lakes. CALM will liaise with other government departments to ensure land practices are appropriate for the area between the groundwater divide and the Yalgorup Lakes. Information will also be provided to landholders on the importance of minimising nutrient input into the lakes and research will be encouraged into the hydrology of the Park. Recreational activities will not be permitted on the lakes other than Lake Preston. Information will be provided to visitors on the lakes conservation values and the possible impacts their activities could have.

Concern was also expressed about the dune and wetland systems. Vehicles will be restricted to the unvegetated beach face and will not be allowed in the foredunes. Blowouts will be monitored and rehabilitated if necessary and a program, which will include dune stabilization techniques, will be prepared. Access to lake foreshore areas will be controlled.

The community would like more information about the Park and more signs in the Park. A central information shelter has recently been built in the Park and smaller information/interpretation facilities at Mount John Road, Lake Hayward, Martins Tank, White Ell Road, and at the Lime Kilns are proposed. Signs will be strategically placed throughout the Park to either direct visitors or to provide further information and interpretation.

Flora/Fauna Protection

At the workshop the community felt that the stromatolites/thrombolites were important and had to be protected. Water quality and any activities in the catchment area that could be a threat to the stromatolites need to be controlled and monitored. Native fauna habitats and any rare or priority flora in the Park will be protected. Programs to control feral animals will be continued and increased. All proposed developments and operations will follow dieback hygiene practices. Plant disease surveys will continue and visitors will be encouraged to stay on well-formed roads or tracks.

Staffing

The community indicated, that another Ranger should be located at the northern end of the Park and this has been proposed in the plan. All Park staff should receive relevant training.

Facilities

The community would like more facilities toward the northern end of the Park. The desire for more facilities has been addressed in the plan and includes picnic tables, toilets, fire rings, lookouts and an observation platform.

Weed Control

Weeds are a problem in the Park. The plan aims to control or, if possible, eradicate weeds that have the potential to cause major environmental problems.

External Impacts

External impacts are factors from outside the Park boundaries that affect the Park. CALM will liaise with private property owners and encourage them to manage their properties in sympathy with Park objectives. CALM will also liaise with other government departments to ensure land practices are appropriate for the area. Where possible, improvements in Park boundaries will be pursued as opportunities for land acquisitions and land exchanges arise.

PART B PRINCIPAL MANAGEMENT DIRECTIONS

3. POLICIES AND GOALS

Yalgorup Draft Management Plan is based on relevant sections of the Conservation and Land Management Act 1984 and the Wildlife Conservation Act 1950, and associated regulations. Policies of CALM and the NPNCA also guided this Plan and are available to the public on request.

The following management goals for Yalgorup National Park cover the major management issues and give structure to the Draft Management Plan:

Conservation
Conserve biological, physical, cultural and landscape values.

Recreation
Facilitate public enjoyment of natural and cultural values in a manner compatible with
conservation and other goals.

Community Relations
Promote awareness, appreciation and understanding of natural and cultural values and facilitate liaison with the community.

Commercial and other Uses
Ensure that commercial and other uses are controlled and managed in a manner that
minimises impact on other values.

Interaction with Nearby Lands and Waters
Promote cooperation, and minimise conflicts in matters associated with use of nearby lands and waters.

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

Plan Structure
Goals represent the "long-term desirable situation" while more specific objectives are designed to achieve these goals. Objectives, background and recommendations are set for each of the sections of the Management Plan.

4. LAND TENURE AND PARK BOUNDARIES

The objectives are to:

- **Ensure that the gazetted purpose, vesting and tenure of the Park and its surrounds protect the Park's values.**
- **Incorporate appropriate lands and waters within the Park where possible.**

Yalgorup National Park covers an area of 12 888 hectares. It is comprised of Reserve 11710 (10 425 hectares), Reserve 22057 (360 hectares), Reserve 12189 (1584 hectares), Reserve 21271 (520 hectares) and Wellington Location 5524 (1077 hectares), which was added to the Park on January 31, 1992 (See Map

The Park's boundaries are the high water mark along some of the shores of Lake Clifton and most of the shores of Lake Preston, including the fringe of paperbark, rushes and sedges around the edges which are subject to inundation in winter. In some areas the boundaries of properties are unfenced, or not correctly or clearly demarcated on the ground and consequently stock enter into the Park's fringing vegetation. This is of particular concern along the western shores of Lake Clifton. Other areas of fringing vegetation are presently vested in the City of Mandurah, Shire of Waroona or Shire of Harvey (Table 2). It would be more appropriate if these local government reserves were incorporated in the National Park, as recommended in the System Six Red Book (EPA, 1983). Whenever possible, areas of fringing vegetation should be incorporated in the Park, as they have high conservation value and provide a protective buffer around the Lakes. The Lake Josephine wetland at the southern end of Lake Preston is an example of an area that includes this type of fringing vegetation of conservation value, near to the Park .

Other camping and recreation reserves vested in local government exist adjacent to the National Park. It is desirable that these areas are managed in ways consistent with the

National Park management objectives. Local governments should be assisted by CALM whenever required to help manage these reserves, particularly those with high conservation values. Reserve 22091, which is vested in the Shire of Waroona, is adjacent to the National Park on the west side of Lake Preston. It has high conservation value and to extend its purpose to include protecting the environment, as recommended by the State Planning Commission in the Preston Beach Coastal Plan (SPC, 1989), may be appropriate. Fire management in this reserve is very important and close liaison between CALM and the Shire of Waroona will be necessary.

Two other reserves are vested in Mandurab City Council and are adjacent to the Park's northern and north-western boundaries. The Tims Thicket Reserve 24198 and the Melros Reserve 33139 have high conservation and recreation values. The possibility of these being included in the Park, through land exchanges, or having them managed in sympathy with the Park by the City of Mandurah is being investigated. A proposal to exchange land to consolidate Park boundaries in the Tim's Thicket area is currently under negotiation (EPA, 1994). Melros reserve contains a Priority 4 flora species, *Conostylis pauciflora.* sub sp. *pauciflora.* Tims Thicket Reserve south of Tims Thicket Road, is noted for its diverse bird population, Grey Kangaroo, Emu and Brush Wallaby and the occurrence of Fremantle Mallee. Tims Thicket is very popular and is used frequently by recreators, particularly fishermen. There is a strip of vacant Crown land along the coast that is held by the Department of Land Administration. Where the National Park joins this coastal strip, the National Park could be extended to low water mark. Lake Clifton Townsite is also vacant Crown land held by the Department of Land Administration. Although a part of it may be subject to mining, inclusion after rehabilitation would be appropriate as this area contains a Priority 3 flora species, *Lepidium oseadotasmanicum*.

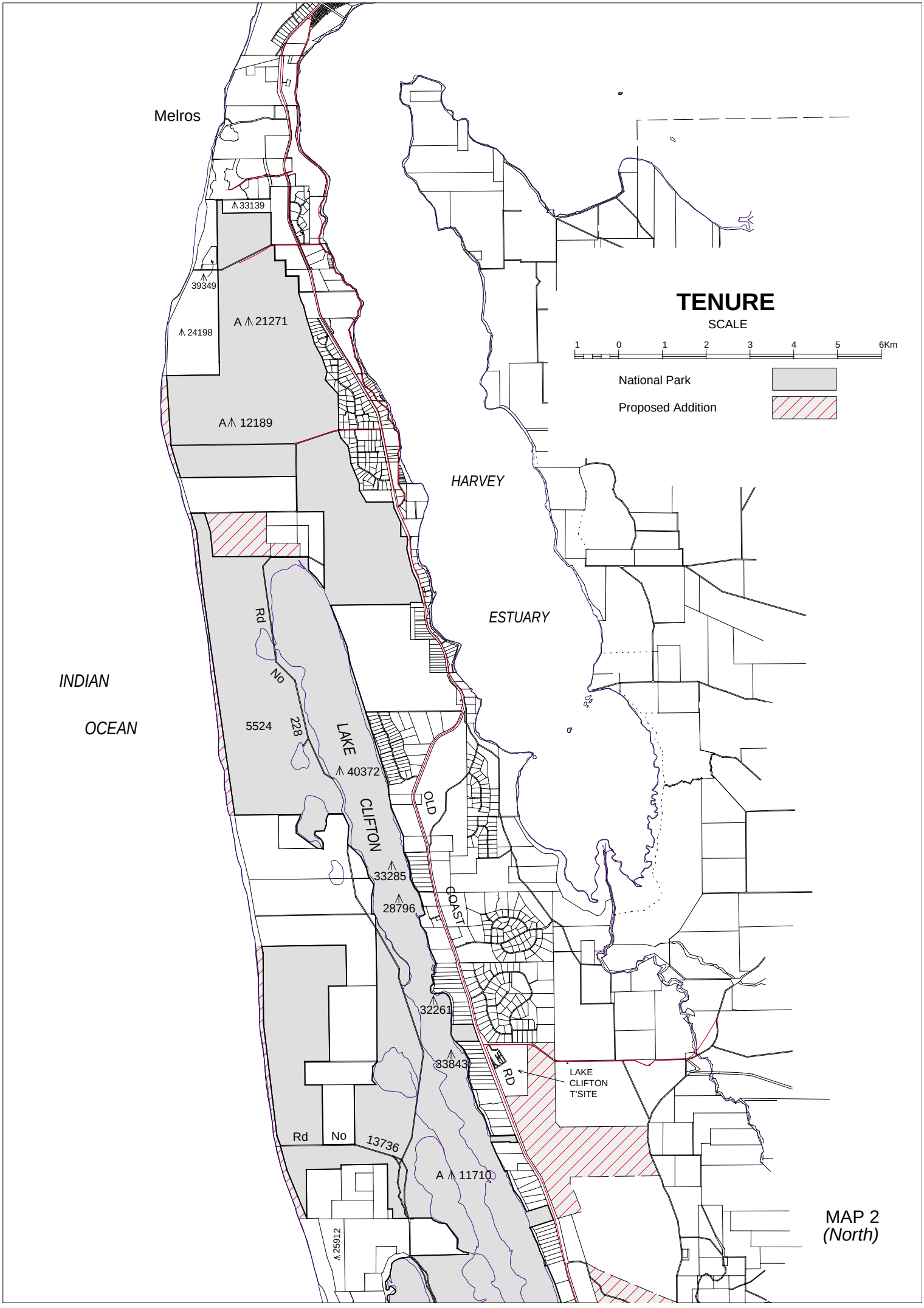
TABLE 2. RESERVES WHICH SHOULD BE CONSIDERED FOR INCLUSION IN YALGORUP NATIONAL PARK OR AT LEAST MANAGED IN A MANNER COMPATIBLE WITH THE PARK

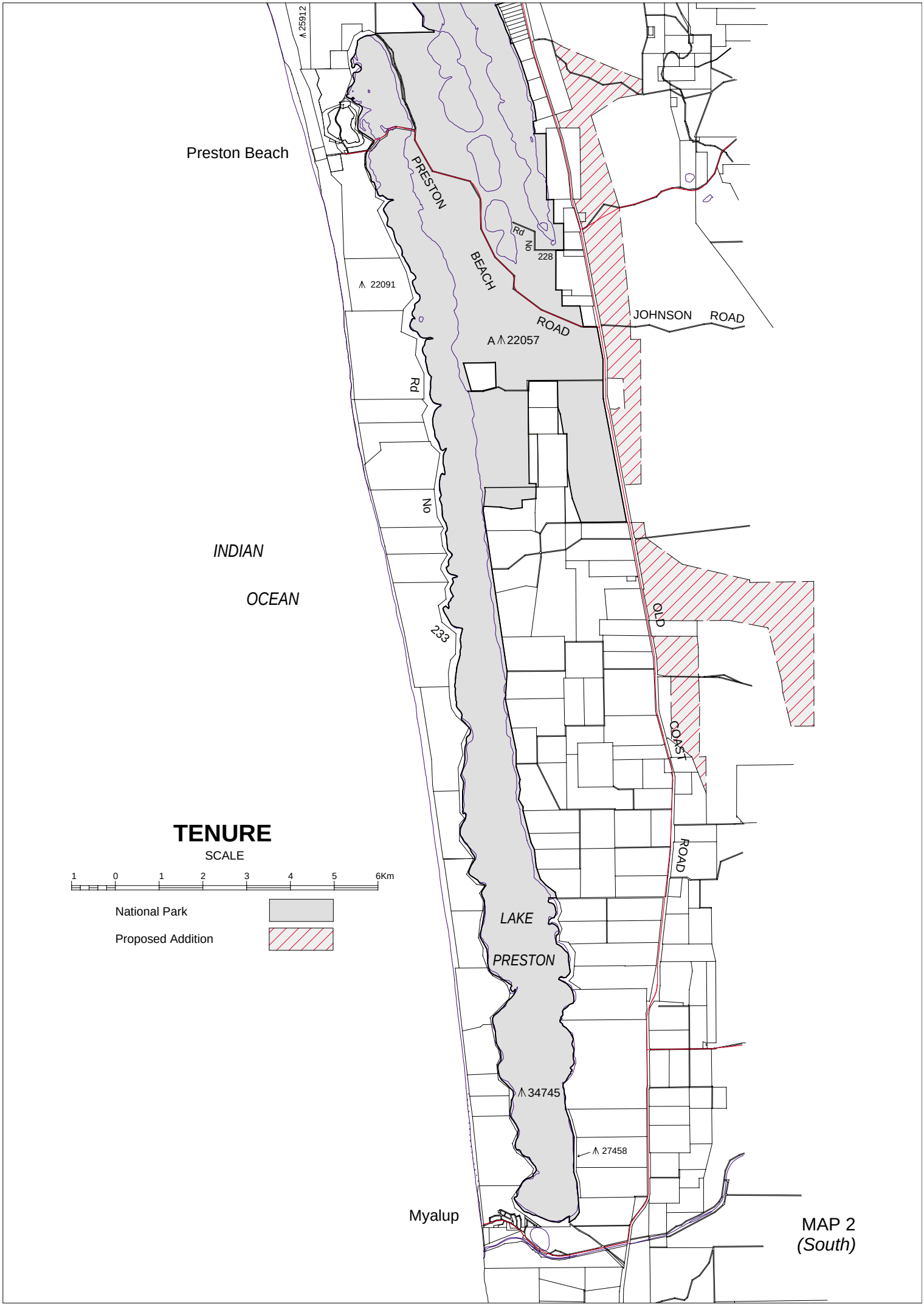
Reserve	Location	Present Purpose	Reasons for being considered for Inclusion
Melros Reserve 33139	Mandurah City	Youth Camp Site	High Conservation and Recreation Value.
Tims Thicket Reserve 24198	Mandurah City	Camping and Recreation	High Conservation and Recreation Value
Foreshore Reserves 40372 and 33285	Mandurah City	Public Recreation	High Environmental Protection Value.
Foreshore Reserves 32261 and 33843 and 28796	Waroona Shire (unvested)	Public Recreation	High Environmental Protection Value.
Foreshore Reserve 1.1745	Harvey Shire	Public Recreation	High Environmental Protection Value
Marram Grass Reserve 25912	Waroona. Shire (Dept. of Agriculture)	Marram Production	High Coastal Management Rehabilitation Value.
Lake Clifton Townsite	Waroona Shire	Vacant Crown Land	High Conservation and Recreation Value
Foreshore Reserve 27458	Harvey Shire	(unvested)	High Environmental Protection Value.

Managing coastal areas has become an increasingly important responsibility for CALM in the last few years. Reserve 25912, which is vested in the Department of Agriculture for the propagation and harvesting of marram grass, lies just north-west of the Preston Beach Townsite (see Map 2). It would be appropriate for this reserve to be vested in CALM.

Road reserves within the Park, which are no longer required or which need to be removed because of conservation considerations, are subject to negotiations between local government, CALM and other parties who may be affected if the road is closed. Road reserves that have not been developed close to the edge of any of the lakes should become part of the National Park to conserve and protect the Park's values.

Private property owners near the lakes and, in particular, owners of property adjacent to Lake Clifton and Lake Preston, need to be kept informed of opportunities to manage their properties in a manner complementary to management of the Park. Local government authorities similarly need to be part of the program to help maintain standards to protect the


Melros
33139
39349
A 21271
24198
A 12189
HARVEY
ESTUARY
INDIAN
OCEAN
Rd
No
5524
228
LAKE
CLIFTON
40372
OLD
COAST
33285
28796
32261
33843
RD
LAKE
CLIFTON
T'SITE
Rd
No
13736
A 11710
25912
TENURE
SCALE
1 0 1 2 3 4 5 6Km
National Park
Proposed Addition
MAP 2
(North)


Preston Beach
PRESTON BEACH ROAD
Rd No 228
JOHNSON ROAD
A 22057
22091
25912
Rd No 233
INDIAN OCEAN
OLD COAST ROAD
LAKE PRESTON
34745
27458
Myalup
TENURE
SCALE
1 0 1 2 3 4 5 6Km
National Park
Proposed Addition
MAP 2
(South)

lake system located near their reserves, and to inform landholders and residents about land restrictions and the use of particular areas of lakes. An information brochure distributed to both land holders and local government authorities is needed. Local authorities could provide the brochures to real estate agents selling land in sensitive areas.

Land transfer and land acquisition are continuous processes that aim to rationalise National Park boundaries. The most recent addition to Yalgorup National Park is Location 5524, which was purchased from the State Energy Commission and added about 1000 hectares to the Park. Land transfers with private property owners have occurred to the east of the Tims Thicket/White Hill Road block to smooth out the boundary line of the Park. Other areas that have been proposed to be included in the National Park are three areas in adjoining State forest, east of Old Coast Road (See Section 36). A Marine Park or Marine Nature Reserve, consisting of the Bouvard Reefs and coastal waters adjacent to the Yalgorup National Park, may be considered for reservation in the future as suggested in the Preston Beach Coastal Plan (SPC, 1989).

Actions

Continue negotiations to cancel unnecessary road reserves within the Park boundaries including Quail Road Reserve which runs east-west, the northern section of Road Reserve 228 and 13736, and add these to Yalgorup National Park (Map 2).

2. Extend the Park boundary along the coast to the low water mark.

3. Acquire, by purchase or exchange when opportunities arise and funds are available, private property enclaves and properties adjoining the Park that have exceptional conservation or recreation values, management benefits, or that could protect areas with these values within the Park.

4. Negotiate with the relevant State or local government authorities about adding to the Park the following reserves: 40372, 33285, 28796, 32261, 338439 34745, 27458 and 25912 (Table 2).

5. Acquire for the Park or seek sympathetic management, from current vesting bodies, of Melros Reserve 33139 and Tims Thicket Reserve 24198.

6. Encourage the Waroona Shire Council to include protection of the environment in the purpose of Reserve 22091.

7. **Investigate the conservation values of the Bouvard Reefs and coastal waters adjacent to Yalgorup National Park and if appropriate recommend their inclusion in a Marine Park or Marine Nature Reserve.**

5. ZONING

The objective is to develop and implement a zoning system on which protection of the Park's conservation values and development of recreation and compatible uses can be based.

Yalgorup National Park has significant environmental, conservation and scientific values. Most of the Park is suited only to minimum impact recreation.

Three water-based zones are proposed:

- Special Preservation (no boating, swimming or canoeing)
- 2. Natural Environment (canoeing only)
- 3. Recreation (motorized boating and sailing).

The lower third of Lake Preston is zoned for water skiing, for use by motor boats and for use by canoes. The upper section of Lake Preston and the remaining lakes within the Park is zoned for no boating or swimming.

Martins Tank is a hypersaline lake and algal mats are formed in a small area. Waterbirds are seldom seen in the vicinity of the lake because of its high salinity levels. With the newly upgraded camping grounds at Martins Tank it may be possible to provide for canoeing. This will be investigated in the future. Where algal mats are present, zoning within the lake to exclude canoes could be part of the education and interpretation program. Permission is necessary from CALM for using boats for scientific study on any of the lakes.

Four land-based zones are proposed:

1. Special Preservation
2. Natural Environment
3. Recreation
4. Recreation Services (facilities and infrastructure)

In the special preservation zone, access and use will be strictly controlled or may be prohibited altogether. In the natural environment zone a selected range of low-density outdoor activities with a minimum of related facilities will be permitted, and in the recreation zone motorized access will be permitted but will be separated from non-motorized access. The recreation services zone includes recreational facilities and the Ranger's station. Within the recreation service areas, only environmentally sensitive facilities will be provided based on specific site characteristics.

Walk tracks (Section 24) will be provided in the area of the Park on the west side of Lake Clifton. This area is sensitive and contains some plant species that are not well represented in other areas of the Park. Wildlife can be readily observed in this area and the varied topography will allow lookouts to be located to view the wildlife and lakes. Another sensitive area south of Johnson Road contains fresh water ephemeral wetlands and important plant species associated with them. This area is zoned Special Preservation. Other areas

Dual purpose tracks will be provided for walking and cycling along the lakes where tracks are compacted and have been closed to motor vehicles.

To encourage horse riding outside the Lake Clifton catchment, horse trails will follow the Park's external boundaries (Section 23). Linking existing properties with the 10th Light Horse Bridle trail and the beach will provide a continuous path outside the lake system catchment area and avoid unacceptable impact on the ecology of the lake system.

Numerous access points exist for two wheel drive vehicles and motorcycles, and additional access through the Park, close to the ocean, will be provided along Preston Beach Road North. Wherever possible, roads will be upgraded to improve two wheel drive access into or through the Park.

Four wheel drive vehicles and motorcycles have access along the beach, except where vegetation is located. Beach access for four wheel drive vehicles is located at the end of Tims Thicket Road, White Hill Road, Preston Beach Road and Myalup Beach Road.

Providing access and facilities in four separate land-based zones will also require access points to these zones to be clearly signposted. The access controls will need to be enforced to separate incompatible activities. At the information shelters, maps could show the land and water-based zones and give reasons for these zones based on the need to protect and conserve the Park's values.

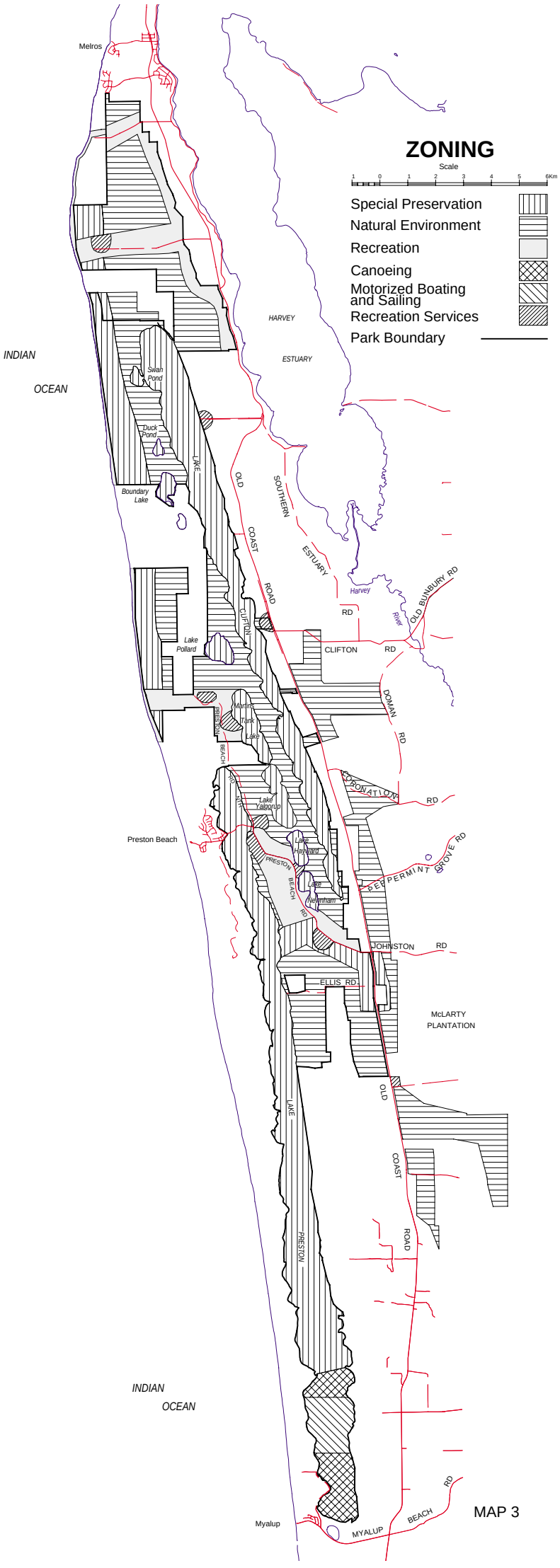
Actions

Introduce a zoning scheme to manage the Park (Map 3).

2. **Develop appropriate access and recreational facilities in each zone according to environmental sensitivity and ease of management.**

3. **Control access to separate incompatible activities and provide for equitable use.**

4. **Inform the public of the zoning system, including where access is allowed, and the reasons for the zones.**


ZONING
Scale
1 0 1 2 3 4 5 6Km
Special Preservation
Natural Environment
Recreation
Canoeing
Motorized Boating and Sailing
Recreation Services
Park Boundary
Melros
INDIAN
OCEAN
HARVEY
ESTUARY
Swan Pond
Duck Pond
Boundary Lake
LAKE
OLD
SOUTHERN
COAST
ROAD
ESTUARY
Harvey River
OLD BUNBURY RD
RD
CLIFTON
CLIFTON
RD
Lake Pollard
DOMAN
RD
Marron's Tank Lake
PRESTON BEACH RD
CORONATION
RD
Lake Yalgorup
Preston Beach
Lake Hayward
PEPPERMINT GROVE RD
PRESTON BEACH RD
Lake Newnham
JOHNSTON
RD
ELLIS RD
McLARTY PLANTATION
OLD
COAST
ROAD
LAKE
PRESTON
INDIAN
OCEAN
Myalup
MYALUP
BEACH
RD

MAP 3

PART C CONSERVATION STRATEGY

6. CONSERVATION STRATEGY

The conservation strategy focuses on preserving the living stromatolites and thrombolites in Lake Clifton and the unique and diverse benthic microbial communities of the Yalgorup lakes. These features have high conservation and scientific value and their protection is a high priority for the Yalgorup National Park. The living stromatolites and thrombolites are located along the eastern edge of Lake Clifton with the area of highest density being in the north-eastern end. This area of water and the surrounding land within the groundwater divide is zoned to reflect high conservation value and needs to be carefully managed (see Section 10).

The lakes in Yalgorup National Park are within the Peel Yalgorup Wetland of International Importance (Ramsar Convention), one of nine such sites in Western Australia (CALM, 1990). Transequatorial migratory waders use the areas as important summer feeding habitat and refuge.

Yalgorup's cultural and landscape values are regionally important, and the Tuart/Peppermint vegetation complexes are becoming increasingly important because of clearing and degradation elsewhere throughout the coastal plain. Regionally important vegetation complexes and their associated fauna habitats, make Yalgorup an important Park for protecting and reintroducing threatened fauna.

The Park's close proximity to educational institutions in Perth, Bunbury and Mandurah makes it very valuable for scientific study. An important part of the conservation strategy is to ensure that recreation activities are compatible with protecting and maintaining conservation values.

With this high conservation and scientific value in Yalgorup National Park and the high degree of vulnerability of the Park, the emphasis for management will be for conservation and scientific study. Providing for the growing demand for recreation in the Park and minimising associated land-use conflicts will require careful planning and active management. Local and State government departments will play an integral part in protecting the conservation values of Yalgorup. Good liaison between CALM and other government bodies and private landholders is essential.

7. GEOLOGY, LANDFORMS AND SOILS

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

The Yalgorup National Park is located on the western edge of the Swan Coastal Plain, north of Bunbury and south of the Dawesville Channel. The area is characterised by an accumulation of late Tertiary and Quaternary limestones, sands and clay. In the immediate vicinity of the lakes, soils are estuarine sands and mud (McArthur and Bartle, 1990; Coshell and Rosen, 1994). In the remaining area of the Park, soils are sands mostly of marine origin. Limestone underlies all sands at varying depth and outcrops are common.

Marine quartz and skeletal sands, transported shoreward from the gently inclined shelf by the prevailing westerly swells, form a complex beach dune system. These coastal barrier ridges now form the region's most prominent topographical features. The lakes lie in the depression between the series of linear coastal barrier dunes and act in some cases as groundwater sinks (Commander, 1988). The differences in these interdunal lakes is influenced by connections with the regional groundwater discharge from the large unconfined aquifer that lies to the east of the lakeland system, and by surface runoff.

The Quindalup Dune System consists of recently formed sand dunes extending inland for I to 2 kilometres from the beach. These dunes are subject to movement and blowouts are frequent (Map 4). Calcareous material can be observed in some exposed areas near the coast as small concretions or nodules that were formerly roots.

The Spearwood Dune System, located inland from the Quindalup, System, is composed of somewhat leached sand at the surface with creamy yellow to reddish brown sand at greater depth. Tuart *(Eucalyptus gomphocephala) occurs* particularly on the low sand ridges of the Spearwood system but also in a narrow strip to the west of Lake Preston and Lake Clifton.

Lake Clifton lies between two coastal barriers, one to the east as high as 70 metres and one to the west that is low, narrow and separates the lake from the other nine lakes. A third barrier separates the chain of lakes from Lake Preston, which is the furthest lake to the south-west.

The Vasse Lagoonal System surrounds the coastal lake system with its low lying, poorly drained terraces and flats. This system has conservation values that are important to the lakes' ecology and needs protecting. Land capability maps, available from the Department of Agriculture, use the landform. and soil map as a base map. Areas that are more vulnerable to damage by grazing or off-road vehicles can be readily identified by capability maps.

Lake Preston contains relict microbialite mounds as well as large tepee structures (Moore and Burne, 1999; Coshell and Rosen, 1994). Tepees, structures formed in a sheet of limestone, occur in zones of groundwater resurgence and


SOIL ASSOCIATIONS
Scale
1 0 1 2 3 4 5 6Km
Quindalup plain system
Spearwood dune and plain system
Vasse estuarine and lagoonal system
Bassendean dune and plains system
Pinjarra plain
Park Boundary
Proposed Addition
Source: Department of Agriculture

MAP 4

microbialites, can also be seen along the edge of the lakes (Coshell and Rosen, 1994). Caves occur in Yalgorup National Park, although very few have been marked on any maps.

Actions

Identify specific areas of the Park that are vulnerable to damage due to the nature of the geology, soils and landforms.

2. **Minimise development along the edge of the lakes and disturbance to the vegetation and foreshores of the Vasse Lagoonal System (See Map 4).**

3. **Locate and design recreation sites to prevent or minimise their impact on fragile geological features and landforms.**

4. **Minimise management activities in, and public access to, the coastal dunes areas.**

5. **Locate access roads and recreation sites according to specialist advice on prevailing wind direction, stabilisation of slopes, disease-risk, and land capability.**

6. **Provide interpretive information on the Park's geology, its relationship with landforms, soils and vegetation and their vulnerability to damage.**

8. VEGETATION AND FLORA

The objectives are to:

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

The vegetation in Yalgorup National Park varies widely in its structure (height and density) and floristics (contributing flora species) and includes forests, woodlands (sometimes with a history of grazing), heaths and herbfields. Almost all the vegetation complexes found in the t
t s
Park are only found in the coastal areas of Southwestern Australia and only a few of these areas are well protected in conservation reserves. Some of the vegetation groups within the following complexes are likely to be unique, found only within the park.

Vegetation Complexes

Yalgorup National Park currently contains five broad vegetation complexes (Map 5). These are not well represented in the conservation estate in WA but what little there is, is mostly reserved in the Park and within the proposed additions (Table 2).


VEGETATION COMPLEXES
Scale
1 0 1 2 3 4 5 6Km
Quindalup Complex
Cottesloe Complex (central & south)
Vasse Complex
Karrakatta Complex (central & south)
Yoongarillup Complex
Bassendean Complex (central & south)
Park Boundary
Proposed Additions
Source: Darling vegetation complexes by Heddle,Loneragan & Havel August 1978

MAP 5

TABLE 3. YALGORUP VEGETATION COMPLEXES AND THE CONSERVATION ESTATE IN WA

Source: CALM's Land Information Branch

Percentage reserved in the conservation estate (including Yalgorup's proposed addition)	Percentage of this reserved in the Park
Yoongarillup 14	72
Vasse 14	34
Cottesloe 8	77
Quindalup 7	64
Karrakatta 5	48

The **Quindalup complex** is the vegetation found on the Quindalup dunes (Section 7 and averages 1.5 kilometres in width along the coast. The dunes closest to the beach have species that can tolerate sandblasting, salt spray, intense glare and summer drought found in these environments. To cope they often have adaptations such as dense hair layers and thick resinous coatings on their leaves, or are succulent. The dune building foredune grass *Spinifex hirsutu*s for example, has hair layers on its leaves and the shrub Scaevola crassifolia, which is common on the first stabilized dunes, has resinous leaves. The calcareous sands in this complex and their extensive heaths and low shrublands are among the best examples of these remaining on the west coast.

Blowouts, where the wind has eroded the foredune and stabilized dunes, creating a mobile dune, are common in the Quindalup complex. They can be initiated by natural processes, such as undercutting of the dunes by storm surges, although they can be initiated by human activities, particularly the driving of vehicles in the dune system.

The Quindalup complex can be subdivided into four age groups reflecting their age and shapes. These four groups have different vegetation, reflecting the results of processes such as subsurface soil changes and differing accumulations of nutrients and humus. The youngest group has shrublands, often dominated by a mixture of Acacia rostellifera and Olearia axillaris. Acacia rostellifera stands are usually of uniform age, with origin owing to either fires that have either stimulated seed germination or regrowth from suckers. In the absence fire, Olearia axillaris eventually outcompetes the acacia. The second youngest group has variety of vegetation but is most commonly dominated by heaths or shrublands, with Melaleuca acerosa often prolific. The two older groups have a variety of vegetation types with acacia common but also including Melaleuca acerosa and Pimeleaferruginea. ~casional older dunes have taller vegetation of woodlands of Agonis flexuosa with dune substrate understories. Stands dominated by Xanthorrhoea preissii (Blackboy) are not uncommon some of the older dunes.

Vegetation groups have been identified and mapped for the northern section of the Par (Trudgen, 1991). Extending this study to cover the entire Park will supplement existing mapping information to aid planning and management.

The **Cottesloe complex** joining the Quindalup complex is a mixed eucalypt forest with relatively tall second storey. It consists of Tuart (Eucalyptus

narrow-leafed Red Mallee *(Eucalyptus foecunda)*. Common species in the second tree layer of this complex include *Banksia attenuata, Agonisflexuosa* and *Allocasuarinafraseriana.*

The **Yoongarillup complex** is comprised of Tuart, with a second story of Peppermint *(Agonis flexuosa)* and surrounds Lake Clifton and sections of Lake Preston. Tuart often exceed 30 metres in height in this area. Species often associated with Tuart include a second storey of *Allocasuarinafraseriana, Banksia grandis, Banksia attenuata, Banksia littoralis,* and an understorey of *Acacia saligna, Acacia pulchella, Jacksonia sternbergiana, Melaleuca acerosa* and *Hibbertia hypericoides.*

The **Vasse complex** is a wetter vegetation complex with eucalypts and paperbarks. It occurs in a few small areas north of Lake Preston and south of Lake Clifton and is characterised by Tuart, Jarrah, Flooded gum *(Eucalyptus rudis),* Paperbark *(Melaleuca rhaphlophylla)* and Marri *(Eucalyptus calophylla).*

The **Karrakatta complex** is comprised of a mixed eucalyptus forest with a representative second story dominated by banksias. It occurs in a small area in the north eastern section of the Park. This vegetation complex includes Tuart, Jarrah, Marri and Banksia.

The **Bassendean complex** is mainly comprised of Jarrah with a mixed second storey. It is not presently represented within the Park, but is represented in the areas of State Forest to the cast of Old Coast Road, proposed for addition to the Park (CALM, 1987). The Bassendean complex is composed of Jarrah, Banksia, Sheoak and Paperbark with sedges and rushes occasionally in the lower understorey.

Fringing Vegetation around the Lakes and Ephemeral Wetlands

A narrow Paperbark Swamp vegetation complex occurs around the edges of the lakes and is mainly composed of the two species, *Melaleuca cuticularis* and *Melaleuca rhaphiophylla. Melaleuca lanceolata* or Rottnest Tea Tree also occurs, surrounded by *Melaleuca cuticularis* in a small area on an island north of the causeway over Lake Preston. In areas subject to flooding *Melaleuca preissiana* occurs. These are particularly notable in the southern extension of the Lake Clifton depression where sedge swamps mainly composed of *Gahnia trifida, Leptocarpus aristatus* and *Melaleuca viminea* also occur. Some patches of freshwater in this area are colonised by *Typha domingensis.* Several orchid species reach their northern limits of distribution in the Park , and can often be found near fresh water ephemeral wetlands south of Preston Beach, Johnson and Ellis Roads. Two orchid species occur as distinct populations in the Park and one species is endemic to the Yalgorup area.

The vegetation of Yalgorup National Park is of high conservation value because of its good condition, because communities have limited distribution outside the Park and because these vegetation types are poorly represented in the conservation reserves. In particular the Park contains Tuart /Peppermint stands which are in good condition and also limited outside the Park.

priority 2 group has few populations known that occur on lands considered secure for conservation. Two priority 3 flora, *Hibbertia spicata* subsp. *leptotheca* and *Stylidium sp. Yalgorup* occur in the Park. This priority 3 group has several known populations, some of which occur on secure conservation lands, or the taxa is deemed to be not under immediate threat. The Lake Clifton Townsite area also contains a priority 3 species, *Lepidium pseudotasmanicum*. One priority 4 flora *Conosiylis pauciflora* subsp. *pauciflora, is* also found here. This group has flora that have been adequately surveyed and found to be secure but require monitoring to check that their conservation status does not change.

Most of priority flora are found in the Cottesloe complex and heaths and limestone outcrops are important habitats. The Tuart forest also contains a number of priority flora. Although it appears that there is a concentration of priority flora in the northern section of the Park, this may change once a more detailed survey has been undertaken in the south. When threatened or priority flora are found, they should be mapped, protected and biological information on them used to determine the most appropriate management strategy to use to ensure their survival. Fencing, nurturing and reintroducing threatened or priority flora may also be considered.

Actions

1 **Locate threatened and priority flora species and store information on biology, location, and herbarium specimens at the District Office, the State Herbarium and at CALM's Como Office. Consult records and take appropriate action before undertaking development or management activities.**

2. **Extend the detailed vegetation and flora survey undertaken in the Park's northern section to cover the entire Park and important adjacent areas. Locate populations of important vegetation groups and priority and fire sensitive species, and develop management recommendations for their conservation particularly preceding any new recreational site development or burning operation.**

3. **Protect areas that are in good condition and protect and consider enhancing areas with threatened and priority flora, particularly those vegetation communities and species susceptible to disturbance, plant disease or weed invasion.**

4. **Protect and restore the Vasse Lagoonal Complex, the Quindalup Dune Complex and the fringing vegetation around the Lakes.**

5. **Minimise or prevent the removal of or damage to vegetation from constructing and maintaining roads and tracks, and developing and maintaining facilities for visitor use.**

6. **Provide visitors with opportunities to view and increase their**

7. **Retain representative areas of each vegetation community in locations that have been unburnt for extended periods of time (Section 18).**

9. FAUNA

The objectives are to:

- **Protect and conserve indigenous fauna with an emphasis on threatened and protected species.**
- **Protect and conserve waterbird populations and habitats.**

Indigenous Fauna

There have been no detailed or systematic fauna surveys in Yalgorup, National Park. Western Grey Kangaroos *(Macropus fuliginosus)* are plentiful in Yalgorup National Park. Brush Wallabies *(Macropus irma)* are also present. There is evidence of small populations of Bandicoots *(Isoodon obesulus)* in the Park and recent cofirmation of a small population of Chuditch *(Dasyurus geoffrod).* Local farmers reported the presence of the Wambenger *(Phascogale tapoatafa)* in this area 20-30years ago and have remarked on the disappearance of this arboreal species corresponding with the disappearance of nearby woodlands on private property. The Brush-tailed Possum *(Trichosurus vulpecula)* and the Echidna *(Tachyglossus aculeatus)* have been seen in the area, and the Water Rat *(Hydromys chrysogaster)* has been trapped in the swampy areas just south of Lake Preston.

Some species likely to have been present in the past include the Ring-tail Possum *(I'seudocheirus occidentalis),* the Honey Possum *(Tarsipes rostratus),* the Pigmy Possum *(Cercartetus concinnus)* and the Quokka *(Setonix brachyurus).* Populations of these species would have declined, as did the Wambenger, with the disappearance of woodland areas, while the Quokka's decline may be due primarily to fox predation. Isolated populations of such species may yet be discovered in the Yalgorup National Park with more intensive fauna surveys. There have been a number of sightings of unusual fauna in the vicinity of the Park over a number of years. Areas of the Park still contain suitable habitats that could be restocked with those species likely to have once occupied the area. More intense fauna surveys are essential to determine fauna species still present that could benefit from a recovery program.

Both the size and shape of the Park will limit its effectiveness as a conservation area. The small area of the islands of vegetation associations, the distance between these, and the long narrow shape of the Park combine to reduce effective mixing of the less mobile animal populations. Western Grey Kangaroos *(Macropusfuliginosus)* have in the past reached large numbers, particularly during summer with groups in excess of 80 counted in some areas of the Park (Muir, 1982 report). Damage to coastal vegetation by kangaroos has occurred and culling has been carried out in the past with the cooperation of local farmers and concurrence of the Western Australia, Naturalists Club and the Western Australia Conservation Council. Species of bats present in Yalgorup include Gould's Wattled Bat *(Chalinolobus gouldii)* and the King River

Bird species are well represented in Yalgorup with 43 species counted in 1975, excluding marsh and waterbirds. In 1972 C F H Jenkins added to a bird list compiled by D L Serventy in the 1930s, bringing the total numbers of bird species to 134. Greater number of species are generally present where the habitat is undisturbed, and in these areas birds depend largely on the presence of a canopy. The disturbed areas outside the Park, such as pine forests and agricultural land support a few species not generally present in other areas (Clarke and Wright, 1975).

Birds of interest to locals found in Yalgorup include the Emu *(Drortzaius novaehollandiae),* the Striated Pardalote *(Pardalotus striatus),* the Rainbow Bee-eater *(Merops ornatus),* Richards Pipit *(Anthus novaeseelandiae)* and four different species of honeyeater.

Several amphibians and reptiles occur in Yalgorup. Eight frog species, 13 lizard species and six snake species are on the Western Australian Museum data base as species likely to occur in this area. Eight species of reptiles were collected and identified by the Museum in 1981. One of these, *Ctenotus labillardleri, is* only occasionally found on the Swan Coastal Plain, being more common among granite in the Darling Range. The long-necked tortoise *(Chelodina oblonga) is* present in Lake Clifton.

Little information on the Park's terrestrial invertebrate fauna is available. Local government authorities, CALM and the Public Health Department have developed mosquito and midge control programs and Ross River Virus research has been carried out in the Region. Approval of mosquito and midge control programs is given by CALM and the National Parks and Nature Conservation Authority. Some entomological research has been conducted by Curtin University, however, further research is needed to enable a better understanding of the terrestrial ecology of the Park.

Yalgorup National Park represents a large portion of the region's remaining natural habitats. Camping and recreation reserves are likely to be subjected to heavier public use, and both the Park and neighbouring State forest will provide important habitats to maintain existing species in the region.

The wide range in the size of vegetation units, their diverse variations in soil type, landform, rainfall and a diversity of fire history all help to maintain vegetation diversity and animal diversity. Bird diversity generally increases with plant species diversity as well as foliage height diversity. The present vegetation diversity of Yalgorup National Park could be increased by including some of the neighbouring uncleared property and using these areas to link vegetation 'islands' and form corridors for species movement, which would greatly increase the chances of maintaining the Park's animal communities in the long term. Fauna habitats also need to be recognized and protected to minimise habitat losses due to disease, fire or human disturbance. Examples of important habitats to protect include thickets used for shelter, Peppermint trees used for food or hollow logs used for nesting.

Waterbirds

Yalgorup Lakes include birds that are listed in the Japan-Australia and China-Australia Migratory Bird Agreements. The Peel-Yalgorup system is important as a nesting area and summer sanctuary for waterfowl from inland areas, becoming particularly important as alternative wetlands shrink in area during the summer.

Large numbers of waterfowl and waders use the lakes within Yalgorup National Park. During the summer months between December 1970 and May 1971, waterfowl counts were taken at three weekly intervals by C F H Jenkins along a two mile long transect of Lake Preston. Counts of around 3000 waterbirds were made at each inspection. Over 500 Black Swans *(Cygnus atratus)*, over 1000 Coots *(Fulica atra)*, over 250 Grebes *(Poliocephalus poliocephalus)*, and over 1000 Musk Duck *(Biziura lobata)* were counted in some inspections. During summer periods between 1981-1983, Lake Clifton was surveyed by Neville Stanley and David White who counted over 500 Black Swan, over 2000 Musk Duck, and over 1000 Australian Shelduck *(Tadorna tadornoides)*. 13800 Australian Shelduck were counted in Lake Clifton in November 1986 and 9000 at Lake Preston in November 1988. The Australian Shelduck moult and are flightless in late spring each year and require secure retreats and a quiet refuge. A total of 20725 waterbirds (all species) were counted on Lake Clifton in November 1986.

Within the Martins Tank chain of lakes, Lake Pollard is particularly important for Black Swans during the spring and summer, with more than 2000 Black Swans having been counted on some occasions. The Black Swans graze the extensive growth of *Lamprothamnitun papulosum* that occurs from October to January.

Transequatorial. migratory waders from places such as Japan, China, Siberia and Alaska that have been sighted mostly by Royal Australasian Omithologists Union (RAOU) members include the Bar-tailed Godwit *(Limosa lapponica)*, Red-necked Stint *(Calidris ruficollis)*, Common Sandpiper *(Tringa hypoleucos)*, Marsh Sandpiper *(Tringa stagnatilis)*, Curlew Sandpiper *(Calidrisferruginea)*, Greenshank *(Tringa nebularia)*, Red Knot *(Calidris canutus)* and the Whimbrel *(Numenius phaeopus)*. All of these species are in the Scolopacidae family and are listed in Migratory Birds Agreements.

Other waterbirds that the Yalgorup lakes support include the Banded Stilt *(Cladorhynchus leucocephalus)*, Black-winged Stilt *(Himantopus himantopus)*, Red-necked Avocet *(Recurvirostra novaehollandiae)*, Hooded Plover *(Charadrius rubricollis)*, Red-capped Plover *(Charadrius ruficapillus)* and Australian Pelican *(Pelecanus conspicillatus)* (RAOU records, 1992). The Hooded Plover is significant as sightings in these lakes are unusually far north for Western Australia. A number of bird species breed within the area of fringing vegetation surrounding the lakes. The Red-capped Plover nests on the lake foreshore and is very vulnerable to disturbance. The Great Crested Grebe *(Podiceps cristatus)* has been recorded breeding on Lake Clifton. Another occurrence that gives Yalgorup some distinction is the large number of Musk Ducks (more than 2 000).

1990 and 1992). The total number of waterbird species recorded in Yalgorup National Park is 40.

Many waterbirds, particularly wading birds feeding in the shallows are easily disturbed by humans, cats, dogs or stock. The buffer of fringing vegetation around any lake is important to minimise this disturbance and to protect waterbirds. This vegetated buffer area is also an important nesting and foraging habitat for birds and acts as a filter to maintain the water quality of the lakes.

Threatened Fauna

One declared rare (i. e. threatened) fauna, the Chuditch *(Dasyurus geoffroii)* has been found in the Park. A more detailed survey of the Park may locate the presence of animals such as the Bandicoot *(Isoodon obesulus)* or the Ring-tailed Possum *(Pseudocheirus occidentalis)*. If populations of any threatened fauna are found, management programs specific to these animals and their habitat may be implemented to ensure their survival, along with reintroductions to boost their numbers if warranted and a fox baiting program for their protection. The suitability of Yalgorup National Park for reintroduction of threatened fauna will be investigated. Flora and fauna of the lake system will be covered in the next section.

Actions

1. **Protect fauna habitats from the spread of weeds, disease, wildfires and human disturbance.**

2. **Ensure mosquito and midge research and control programs are approved by CALM's Director of Nature Conservation by virtue of the power delegated to him by the NPNCA (NPNCA, 1993).**

3. **Increase knowledge of the Park's fauna by recording the incidences of death or injury to fauna resulting from motor vehicles and other causes.**

4. **Instigate more intensive fauna surveys and investigate reintroducing former known threatened fauna inhabitants in conjunction with a fox baiting program (See Section 17 Feral Animals).**

10. THE LAKE SYSTEM

The objectives are to:

- **Protect and conserve lake flora and fauna communities, structures, diversity, distribution and the natural processes that sustain them.**
- **Protect and conserve quality and quantity of surface water and groundwater and protect special conservation values associated with the lake system.**
- **Enhance knowledge of lake hydrology and its function in the lake**

Salinity

Ten lakes are located in Yalgorup National Park. Lake Clifton, the furthest inland, stretches about 20 kilometres parallel to the coastline and is the least saline of all the lakes. Lake Preston is closest to the coast, is divided in two by a causeway, stretches about 30 kilometres and has intermediate levels of salinity. Seven smaller saline lakes lie between Lake Clifton and Lake Preston. They are (from north to south) Boundary, Pollard, Martins Tank, Yalgorup, Hayward, North Newnham and South Newnham Lake. Other minor lakes are located in the vicinity of Boundary Lake, including Swan Pond and Duck Pond. Figure I shows the average 1984 spring and autumn salinity levels of the main Yalgorup lakes (Moore et al 1984).

FIGURE 1

Spring and Autumn Salinities of Yalgorup Lakes

Lake Clifton

The salinity and alkalinity in Lake Clifton are similar from one end of the take to the other although the levels vary with depth and distance from the eastern shoreline. Both are affected in winter by the inflow of fresh groundwater rich in bicarbonate ions. The northern half of the eastern shoreline may have the greatest inflow of fresh groundwater and this could account for the take's abundant and diverse assemblage of flora and fauna. In summer the lake may dry out into three basins, with the southernmost basin becoming very saline.

Organosedimentary structures (composed mainly of various carbonate minerals) known as microbialites are produced by the growth and metabolic activity of benthic microbial communities (Burne and Moore, 1987). The microbial communities incorporate sediment grains at a very slow rate and build structures that on the average are about 2000 years old, when they reach a height of 1 metre. Stromatolitic microbialites are laminated structures while thrombolitic microbialites are structures with a disrupted internal framework (Burne and Moore, 1987). Both are very similar externally and can only be distinguished from one another by their internal structure. Microbialites live in Lake Clifton, but not in any other of the lakes. Relict (dead) structures, however, have been found in a number of the other lakes in the Park.

Fossilized laminated stromatolites represent the earliest record of life on Earth, dating from some 3500 million years ago. Marine subtidal microbialites are now known to exist only in Hamelin Pool at Shark Bay and at two locations in the Bahamas. Hamelin Pool microbialites are the most abundant and diverse examples of growing marine microbialites known in the world today. Non-marine microbialites are fairly rare, found in only a few lakes throughout the world. Lake Clifton supports the largest known examples of living non-marine microbialites in the Southern Hemisphere, and is one of only two sites known where microbialites occur in water less salty than sea water.

Stromatolitic microbialites declined 570 million years ago as other organisms evolved that, with their grazing and burrowing, probably disrupted the slow processes involved in forming these laminated structures (Burke and Knott, 1986). Thrombolitic microbialites, on the other hand, increased in abundance 570 million years ago, giving evidence of the effects of grazing and bioturbation on stromatolites in those distant times.

Microbialites in Lake Clifton provide an important refuge for many small animals such as amphipods, isopods, shrimp and fish. Nematodes, polychaetes and a species of sea anenome are also present within or near the microbialites. Bryozoans colonize the microbialites and have also been found within their framework. Two species of snails are present in Lake Clifton, but their grazing is restricted to the shallows and generally they do not occur in and around the microbialites. Macrophytes, including *Lamprothamnium papulosum*, *Ruppia megacarpa* and *Cladophora vagabunda* , *are* also present in Lake Clifton (Moore, 199 1).

Subsurface upwellings of fresh groundwater within the lake and along the eastern foreshore, are colonised by cyanobacteria that stabilise the carbonate sediment that is precipitated about the point of outflow.

The most abundant cyanobacteria within the benthic microbial communities is *Scytonema* (Moore *et al,* 1984). Other cyanobacteria that have been isolated include species of *Oscillatoria, Dichothrix, Chroococcus, Gloecapsa, Johannesbaptistia, GonThosphaeria* and *Spirulina* (Neil, 1984).

The benthic (bottom dwelling) microbial communities need to grow slightly faster than the rate at which sediment is deposited onto microbialites. An apparent increase in nutrient levels in the lake may have caused an increase in the amount of the epiphyte *Cladophora* (Moore and Turner, 1988). In 1988, *Cladophora* was noted to cover microbialites in late spring and summer but the growth was sufficiently light to be removed during autumn and winter through wind-generated wave action. Further phosphate input into Lake Clifton may result in further increase of *Cladophora,* which would inevitably inhibit the formation of microbialites.

Lake Pollard

Lake Pollard has a similar range of salinity to Lake Clifton but with a higher total alkalinity (Burke & Knott, 1989). The benthos is largely dominated by *Lamprothamnium papulosum* from October to January. In December calcium

Preston, South Newnham, Martins Tank and Boundary Lakes

All of these lakes have similar seasonal salinity variations and none form vertical stratification, except for South Newnham where temporary stratification forms in some years. The benthic communities do not generally form algal mats. Areas of Lake Preston and Martins Tank contain some cohesive microbial communities. South Newnham and Martins Tank are border line cases, sometimes having characteristics more similar to the lakes of the next group (Burke, 1990).

Hayward, Yalgorup and North Newnham Lakes

These three lakes show vertical stratification of the water column in winter, when fresher groundwater and rainwater forms a layer across the surface of the lake. Mixing between top and bottom water masses does not occur and solar radiation is trapped within the bottom layer and warms the bottom waters. A cohesive, mucilaginous mat 1-2 centimetres thick of cyanobacteria covers the sediments of all three lakes. The cohesive mats restrict the exchange of water between the lake and the aquifer. The structure and function of the varied benthic: communities in these lakes determine the chemical and physical nature of the overlying lake water (Burke, 1990).

Hydrologic and Biogeochemical Processes

Rainfall recharges an unconfined groundwater system in which groundwater flows from the east westwards towards the lakes. Groundwater discharges into the lakes by seepage along the lake shore and beneath the water at the edge of the lakes. No rivers or streams supply water to the lakes. Recent CSIRO/Curtin University groundwater monitoring in Lake Clifton opposite Mount John Road indicated some possible increase in nutrient levels over time, however, the data collected so far are limited and need to be expanded to cover seasonal and yearly variability.

Lakes such as Lake Clifton are sinks for the fresh groundwater system (Commander, 1988, Burke, 1990). The mean lake levels and the level of the nearby water table are below sea level. Groundwater discharging to the lakes from the east has a salinity of 500 to 1000 mg/I T.D.S. This fresh groundwater is also carbonate rich and the carbonate is deposited as limestone or lime mud along the lake edges. Microbialites are formed in Lake Clifton, for the most part, by calcium carbonate precipitating out of fresh water seepage and being incorporated in the mucilage, secreted by the cyanophyta growing on the bottom of the lake.

Calcium and carbonate ions are removed from the water and precipitated as solid calcium carbonate. During this process phosphorus is usually co-precipitated within the calcium carbonate structure. Phosphorus is normally retained in the ground by geochemical processes and in many wetlands the phosphorus is in organic material. In relatively pristine wetlands, such as Lake Clifton, phosphate is bound in calcium carbonate compounds.

Environmental impact of increasing activity within the Park catchment

Increasing intensity of land use between the lakes and the groundwater divide

Where nutrient levels have been artificially enhanced in many lakes of the Swan Coastal Plain, growth of planktonic and filamentous algae has been stimulated, progressively blocking light from benthic primary producers. This results in a change in the lake's character from one dominated by benthic primary production to one dominated by planktonic primary production. The benthic: microbial communities of the Yalgorup Lakes and specialized microbialites of Lake Clifton, are recognized internationally by the scientific community. These lakes are part of the Peel-Yalgorup System, which is listed as an internationally important wetland under the Ramsar Convention. It may be possible to use appropriate sections of the Environmental Protection Act and the Wildlife Conservation Act to achieve greater protection for the stromatolites and thrombolites in Lake Clifton.

Actions

1. **Liaise with local government to ensure that management of lakeside reserves is consistent with Park management objectives.**

2. **Survey poorly identified tenure boundaries.**

3. **Reposition or establish new fences on foreshores to stop stock entering the lakes or consider an incentive program for private property owners so they will take this initiative.**

4. **Inform landholders of the importance of minimizing nutrient input into the lakes.**

5. **Liaise with local government, relevant State Government agencies, CSIRO and the DEP to provide advice to landholders on land-use practices that are appropriate within the Park catchment area (see State Government section).**

6. **Restrict recreational activities on the lakes to waterskiing and canoeing in the lower section of Lake Preston.**

7. **Provide researchers with permits to use boats on any of the lakes for approved study purposes only.**

8. **Seek greater legislative protection of the Lake Clifton stromatolites and thrombolites.**

11. ABORIGINAL HISTORY

The objective is to protect and conserve the Park's Aboriginal cultural values.

Although Aboriginal people have occupied south-west Australia for at least 40 000 years, little specific information is known about their activities in Yalgorup National Park. Some artefacts have been discovered within the Park boundaries, and the name Yalgorup is derived from the two Aboriginal words 'Yalgor' meaning a swamp or lake, and 'up' a suffix meaning a place. Seven occupation sites within the Park, consisting of varying numbers of stone artefacts are described by Vera Novak in her Report on Aboriginal Sites of the Peel-Preston Lakelands.

The Department of Aboriginal Sites of the WA Museum, currently has no recognised archaeological sites listed within the Park; however, the area has not been examined in detail and it is possible that sites exist. All Aboriginal sites are covered by the Aboriginal Heritage Act (1972-80) regardless of whether or not they are known to the Department of Aboriginal Sites. Section 17 of the Act makes it an offence to excavate, destroy, damage, conceal or in any way alter an Aboriginal site without written permission from the Minister for Aboriginal Affairs. Regionally, two important sites of significance are located within the Peel-Yalgorup area. One is a religious ceremonial site north of the Park, and the second is a cave east of the Park (Novak, 1975, O'Connor et al, 1989).

The south-west Aboriginal people are known collectively as Noongar, although their heritage is derived from various tribes and language groups. The Park's Aboriginal history must be recognised by Park managers as it provides an important element in understanding the Park and its environment. A recent publication on the Aboriginal culture and camp sites in this region devotes one full chapter to Yalgorup (Richards, 1994). Calyure, a local identity and leader amongst his people, is believed to have camped in Yalgorup and immediately north of the Park during the summer months (pers. comm. Frank Nannup).

An interest has been recently shown by individuals from the local Winjan Aboriginal Corporation requesting access and land-use for aboriginal cultural purposes in the Park or in an area proposed to be added to the Park. Involvement by the Aboriginal community in Park interpretation and educational programs would add significantly to the Park's values.

Actions

1. **Identify Noongar people having cultural links and ongoing interests in the Park.**

2. **Consult with Noongar people on matters of cultural interest in Park management or interpretation or field study activities in the Park (NPNCA, 1991).**

3. **Report Aboriginal artefacts or other findings to the Department**

4. **Encourage archaeological and ethnographic surveys of the Yalgorup National Park.**

5. **Ensure that CALM's obligations under relevant legislation are fulfilled if any development activities are proposed in the Park.**

6. **Commence discussions with local aboriginals and other appropriate bodies to address access and use of an area, within or near the Park, for Aboriginal cultural purposes.**

12. EUROPEAN HISTORY

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

In 1829 Lieutenant Surgeon Alexander Collie and Lieutenant William Preston, in charge of a boat party exploring the coastline from Cockburn Sound to Cape Naturaliste, travelled along the coast between Bunbury and Mandurah. They found Lake Preston, later named in Preston's honour, and Lake Clifton named in honour of Mr Marshall Waller Clifton, chief Commissioner of the West Australia Company settlement of Australind (Snell, 1986).

The area between Bunbury and Mandurah had two of the State's earliest large-scale land settlement schemes. The first compromising 500 settlers landed between December 1829 and May 1830 under Thomas Peel. The scheme was abandoned due to problems arising from lack of leadership. The second, started by the West Australian Company in 1841, failed because of poor quality land (National Trust, 1973).

In 1921, the WA Cement Company, which was created under an Act of Parliament, built a lime kiln on the eastern side of Lake Clifton and began extracting lime marl from the lake bed. The settlement at Lake Clifton included a bakery, shop, school, postal receiving point, houses and a boarding school. The Cement Company also built a railway from Lake Clifton to Waroona. Sediment was pumped from the bottom of Lake Clifton, through a pipeline mounted on piles and then into settling ponds where the water evaporated. The lime was shovelled by hand into trucks and later sent on open railway wagons to Waroona. Large kilns were later built to dry the lime when it was found excessive water made it too heavy for freighting to Perth. The operation was found to be uneconomical and closed after a few years. Little traffic used the railway line and it was closed in the same year as the lime kilns. The rails and sleepers were removed and used to construct the Lake Grace-Newdegate railway. The position of the former railway line can be identified today by its raised embankment (Snell, 1986).

An estimated 13 tunnels, dug by pick into the sides of limestone hills, are located in the Park. The year and reason of construction cannot be established, although the date 1927 is scratched into the wall of one tunnel. They are dead end tunnels and very straight, which could suggest they were dug to test for rock suitable for the Bunbury breakwater.

Cottage. Another historically significant homestead southeast of Lake Clifton, still standing, dates back to the 1850s. Associated with both of these homesteads are important family historic links to the land that are still actively present in this area. This historic development has had some impact on the character of this major arterial road, whose improvement has also brought economic and tourism development.

Whittakers Sawmill was built on the Old Coast Road and commenced milling on July 30, 1953. Logging was carried out in Tuart and Jarrah stands in State forest and in areas which later became National Park. The mill closed in 1964. The remains of Whittakers Mill can still he seen in the picnic site area on the Old Coast Road. Whittakers Mill picnic site area is included in the area of State forest proposed to be added to the National Park.

Actions

1. **Collate existing information on historic sites located in the Park and maintain an up-to-date register of sites. Liaise closely with local government, the Peel Development Commission, National Trust of WA, the Heritage Council of WA and the Australian Heritage Commission to prepare and maintain registers and to evaluate potential additions.**

2. **Develop management guidelines for any historic sites in accordance with the Burra Charter, and in liaison with the WA Museum, National Trust, Australian Heritage Commission, tertiary institutions and historical societies.**

3. **Establish a program to conserve historic places, demarcate sites, develop facilities and disseminate visitor information.**

4. **Encourage historical research and an archeological survey to be carried out at the lime kilns.**

5. **Liaise with local historical societies regarding volunteer work and other activities.**

13. LANDSCAPE

The objective is to protect and conserve the Park's visual landscape values.

The Yalgorup National Park falls within the Swan Coastal Plain Landscape Character Type (Table 4). Within this Landscape Character Type there are three classifications of scenic quality, which are indicated in Table 4. They describe a large proportion of the high scenic quality that fall within this category.

One of the most outstanding scenic areas in Yalgorup is the narrow strip of high dunes, covered with low soft-coloured vegetation, immediately behind the white sands of the ocean beaches. The diverse vegetation groups within this scenic area varies in colour seasonally. The coastal heaths and shrublands in this landform are expansive and largely free of disturbance. A number of different descriptions of landscape character type of high scenic quality can be used to describe these areas (Table 4).

Another outstanding landscape is the Tuart forest and woodland found on the limestone belt inland from the coastal dunes. The hillier parts of this belt are some of the most attractive forest settings in the State, and the nearest example of its kind to Perth. It can be classified as a landscape character type of unusual diversity of colour, height and species.

The areas of Tuart woodland once partially cleared and heavily grazed is another landscape with high scenic value. In many cases properties have become attractive parklands where Tuart trees are scattered over pasture. This open parkland is also of high scenic quality.

The views of the lakes from either the east ridge with the ocean in the background, or from the west ridge with the scarp in the background are also of high scenic quality.

Panoramic views can be acquired from numerous locations within the Park. For example, important scenic areas are located on either side of the northern section of Lake Clifton and on either side of the northern section of Lake Preston. The west side of Lake Preston and the west side of the Martins Tank chain of lakes are scenically important because of the steep and irregular slopes and ridges along the entire length of these lakes. These high scenic values are again described in a number of different ways in Table 4.

Roads, public utilities, limestone quarries, blowouts, tree deaths or temporary fire effects have the greatest visual impact and the greatest potential for temporary or permanent loss of visual landscape values. Private property owners adjacent to the Park also have the potential to impact on the Park's landscapes and can detract from the Park's values. Planting trees and shrubs, and designing and locating buildings should be done sensitively on lands adjoining the Park. Where possible urban expansion should avoid areas that are visible from within the Park.

TABLE 4.

SWAN COASTAL PLAIN LANDSCAPE
CHARACTER TYPE
(*Classifications found in Yalgorup National Park)

SCENIC QUALITY	LANDFORM	VEGETATION	WATERFORM
HIGH	*Rounded foothills with steep slopes.	*Scattered remnant vegetation forming an open parkland.	*All estuaries, wetlands and swamps.
	*Dunal formations of distinctive height, configuration or combination which provide obvious contrast to the landform character type (eg. Spearwood dunes).	Remnant or other areas of native vegetation exhibiting an unusual diversity of colour, height or species.	· Watercourse of permanent or intermittent flow with continually changing flow character.
		*Distinctive displays of seasonal colour.	· Reservoirs with dominant natural characteristics.
	*Dissected calcareous dunes featuring rugged limestone cliffs, caves and outcrops (eg. Blackwall Reach).	*Wind shaped, gnarled or dwarfed vegetation unusual in form, colour or texture.	
	· Gently inclined or level areas with distinctive drainage patterns (eg Pinjarra Plain).	*Strongly defined patterns of woodland, dune and wetland vegetation.	
	* Large stretches of coastal landscape free of disturbance (coastal heath). Coastal dunes which display areas of active weathering, steep and irregular slopes and ridges (eg Lancelin).		
	· Prominent limestone cliffs and headlands (eg Cape Peron)		
	· Off-shore and estuarine sandbars and reefs.		
MODERATE	* Expanses of beach with uniform width and colour.	· Less diversity in vegetation with regular patterns in height, colour and texture evident.	· Intermittent watercourses with long stretches of unchanging flow characteristics.
	* Regular coastal edges without bays, inlets or cliffs.	* Vegetation patterns found commonly in the surrounding landscape (coastal heath).	· Reservoirs with some natural characteristics.
	· Areas of plains with common patterns of dissection evident but not distinctive.		
	· Areas of uniform undulation with less distinct drainage.		
	* Dunal formations and uniform height and configuration.		
LOW	· Areas of uniform indistinctly dissected plants with few features	* Extensive areas of vegetation with repetitive patterns or showing little variations or	· Waterbodies with little evident natural characteristics.

Actions

1. Manage all Park landscapes according to CALM's Landscape Management Policy Statement No. 34 and seek specialist advice when implementing the management plan.

2. Plan and implement all activities in the Park to complement rather than detract from the inherent visual qualities of the Park and surrounding landscapes.

3. Classify Park landscapes according to the Departmental Landscape Management System.

4. Any visual alterations to the natural landscape should be subtle, and remain subordinate to natural elements by borrowing extensively from form, line, colour, texture and scale found commonly in the surrounding landscape.

5. The District Manager to view site development plans before any development, maintenance or rehabilitation works are implemented, to ensure conformity with landscape management principles.

6. Use interpretive and explanatory signs before and during operations that affect visual landscape qualities.

7. Focus views onto distinctive features by selective siting and aligning of roads and walking tracks.

8. Give highest priority to rehabilitating previously disturbed sites, such as old quarries in the northern section of the Park, to attain the desired standard of scenic quality.

9. Encourage local authorities, other government agencies and private landholders to use landscape management skills when siting facilities and signs, selecting site-compatible materials and colours, and planning for utilities, roads and building envelopes.

14. EROSION, MINING AND REHABILITATION

The objectives are to:

- Minimise the impact of extracting basic raw materials on Park values and rehabilitate these sites.
- Restore degraded areas to a stable condition, resembling the natural environment as much as possible.
- Protect the Park's values from deleterious effects from exploration and mining.

are possible sources for this material. If mined and rehabilitated, it may still be appropriate to add these areas to the Park.

Limestone quarry rehabilitation should aim to recreate the area's natural character by using locally procured seed and matching the surrounding vegetation and landform as closely as possible.

Lake Clifton was mined after the First World War. Lime kilns are still standing near the lake where the WA Cement Company established a small, but short-lived, cement works.

Erosion and Rehabilitation

Presently there are only a few active dune blowouts. Off road vehicles are responsible for some and uncontrolled beach access by pedestrians causes others. Plant disease introduction and spread can result from disturbance to vegetation. *Armillaria* spread and subsequent deaths of vegetation due to *Annillaria* have been associated with blowouts (pers. comm. Shearer and Fairman, 1992). Frequent fires or overgrazing can also remove vegetation cover and cause blowouts. Dune disturbance and disease spread can be minimised by closing unnecessary roads in the dunes, erecting signs warning of the problem and managing beach access.

Dunes closest to the lakes have been stabilised by long-lived shrubs and trees, while another generation of parabolic coastal dunes is still semi-mobile. The coastal vegetation and advancing dunes have a dynamic relationship in which an equilibrium has been established. The coastal dunes of the Quindalup System have intruded into the lakes over a relatively brief geological period, forming the present geomorphic and benthic environments. The eastern side of the lakes is characterised more by a marly mud geomorphic and benthic environment influenced by the chemistry of the groundwater influx. Human activities can disrupt this equilibrium and mobile dunes are a potential threat to the Tuart terraces, and houses and roads. It is important that buildings and beach access be planned to minimise disrupting and destablising sand dunes.

An example of the potential for blowouts and mobile dunes can be seen west of Lake Preston, approximately 6 kilometres south of Preston Beach. A sand mass 30 metres high is enveloping small trees and brush and is threatening mature Peppermint and Tuart trees. The face of the dune is very steep. *Armillaria luteobubalina* has been isolated at the base.

Wind erosion has caused blowouts at a number of locations along the Yalgorup National Park coastline and rehabilitation has been attempted with varying degrees of success. The use of the exotic plant Marram ' Grass *(Anunophila arenaria) is* a common strategy used by private property owners, land care groups, rehabilitation contractors and State and local government departments. Brushing, using branches and shrubs, is another technique used to stabilise mobile dune systems. A combination of brushing and planting with coastal grasses and beach annuals effectively traps sand and develops a frontal dune that protects vegetation complexes

further inland. CALM will continue to actively involve land care groups, community groups, rehabilitation contractors and private landholders in rehabilitation programs.

Wherever possible, seed or cuttings from native species in the immediate locality should be used for rehabilitation purposes. This ensures the greatest degree of success as well as enabling new vegetation to blend into the existing environment. Sources of brushing material should also be free of diseases. Once a diseased area is found, identifying Armillaria in the field as the cause is relatively easy, and minimal training of field officers would be required.

Actions

1 Ensure that, as far as possible, any mining or excavation operation within or adjacent to the Park has minimum impact on the Park, particularly with regard to landscape values, spread of disease and decrease in water quality.

2. Monitor the movement of dune blowouts. If a blowout is expanding it is likely to destroy management infrastructure or important vegetation or habitats, implement control measures.

3. Prepare a detailed rehabilitation program that prioritises the works to be implemented and includes dune stabilization techniques.

4. Investigate more effective rehabilitation strategies and actively involve private and public groups and individuals in rehabilitation programs.

5. Monitor, evaluate and record progress of rehabilitation techniques used.

6. Ensure native plant species that occur in the Park are used in rehabilitation for brushing, planting and seeding.

7. Train Park staff in all aspects of disease identification and rehabilitation work. Seek specialist advice as required.

8. Ensure that, within any scenic areas, degraded landscapes (such as quarries) are rehabilitated after use or progressively in stages.

15. DISEASE

The objectives are to:

- **Minimise the spread and intensification of disease where it is already present, and prevent introduction into disease free areas.**
- **Minimise detrimental effects of measures used to control disease.**

Diseases

Plant diseases can be caused by a variety of factors including soil borne fungi belonging to the genera *Phytophthora* which can kill a wide range of plant species and reduce the conservation value of areas in Yalgorup National Park. Dieback has a low impact on most of the Park's vegetation complexes. The Karrakatta complex in the Park's north-east is an exception. Dieback has a moderate impact on this small area. Despite the low impact, some species within these complexes are susceptible and every effort should be made to minimise the spread of dieback.

Presently there has been no positive identification of P. *cinnamomi* in the Park. P. *cinnamomi* has been found in areas of State forest east of the Old Coast Road that are proposed to be included in the Park. These areas contain the Karrakatta and the Bassendean complexes. Dieback disease has a high impact on the Bassendean complexes and can result in widespread understorey and overstorey death.

The native plant disease, *Armillaria,* has been found in a number of sites within the National Park. Of particular concern is the apparent association of diseased areas with blowouts (pers. com. Shearer and Fairman). The areas that appear to be the most susceptible to *Armillaria* are those in the Quindalup complex that have a woody scrub component of *Jacksonia* or *Acacia.* It is important that *Armillaria* infected material is not used for brushing and stabilising dunesystems. It is also important that in restoring dune blowouts root material is contained in areas low in the profile and *Armillaria* resistant species are used in rehabilitation.

Before any operation is undertaken in Yalgorup National Park, a dieback survey and sampling are carried out and an assessment is completed to determine whether or not the operation can go ahead. A reconnaissance survey for dieback along a number of firebreaks in the National Park showed that P. *cinnamomi* was not present, but *Armillaria luteobubalina* was. *Armillaria* is another fungal pathogen that invades plant root systems, and produces symptoms similar to *Phytophthora* dieback. *Armillaria* is occasionally spread by spores dispersing in the wind, but the main form of spread within an infection site is by movement through adjoining roots. Minimising the movement of root tissue is important in containing both *Phytophthora* and *Armillaria.* Canker fungi have also been observed in Yalgorup. The range of fungi that make up the canker fungi infect aerial parts of plants, and gradually kill plants from the top down. Canker fungi are spread by air home spores. Research into *Phytophthora, Armillaria* and canker is ongoing.

Armillaria along the coast is an important management consideration as is *Phytophthora* dieback disease further inland, particularly in the Bassendean complex. Banksia are particularly susceptible to both diseases. The understorey found in areas of Tuart and Peppermint appear to be the most resilient to the two diseases. Areas of Tuart do appear to be very sensitive however and deaths commonly occur when these trees are disturbed by nearby development.

Actions

2. **Educate Park users about plant disease, through printed information emphasising preference for summer activity use in the Park and the need to stay on well formed roads or tracks.**

3. **Provide educational signs and printed information for horse riders n disease management strategies.**

4. **Train Park staff to recognise plant diseases, and in sampling a management techniques.**

5. **Determine how susceptible the Park's plant species are to disease, starting with all threatened and priority species.**

16. INTRODUCED PLANTS AND NOXIOUS WEEDS

The objective is to minimise the impact of introduced plants and noxious weeds and their control on Park values.

Eight vegetation types were recognised in the Park. These have been assessed to determine the numbers of native and introduced species in each (see Table 5).

A total of 295 native and 55 introduced species were recorded in the Park (Fox et al, 1980). The weeds identified are adjacent to firebreaks, picnic areas and on formerly cultivated land. Agricultural escapes such as introduced grasses and legumes and agricultural weeds, such as the sow thistles, are included in this list.

TABLE 5.NATIVE AND INTRODUCED SPECIES IN EIGHT DIFFERENT VEGETATION TYPES

(After Fox, Downes & Maslin, 1980)

VEGETATION TYPE	NATIVE	INTRODUCED
Unconsolidated dune heath	28	4
Consolidated dune heath	85	7
Limestone heath	130	14
Tuart woodland	181	29
Paperbark swamp	29	7
Sedge swamp	39	7
Mixed Eucalypt woodland	27	3
Weed community	22	42

Declared plants (noxious weeds) known to be located within the Park are Apple of Sodom *(*Solanum linnaeanum),* Cottonbush *(*Gomphocarpus fruticosa),* Doublegee *(*Emex australis),* Cape Tulip *(*Homeria flaccida)* and Paterson's Curse *(*Echium plantaginewn).* Apple of Sodom is a problem in some areas while the other five only occur in small scattered groups. Other weeds that occur within the Park and in adjoining properties are **Trachyandra divaricata, *Euphorbia peplus, *Euphorbia terracina, *Ehrharta sp* and other various introduced pasture grasses and herbs. Veldt grass *(Ehrharta calycina) is* a problem in the Park and warrants further research and control efforts. Maps showing the distribution of declared and non-declared weeds are held in Dwellingup District Office, and programs to control weeds are implemented with the approval of the District Manager. CALM liaises with Park neighbours, the Agriculture Protection Board and Local Authorities. The effect of control programs on non-target species has been evaluated and is not considered a problem, however, this should be continually assessed.

The invasion by introduced plants is one of the most serious long-term threats to the integrity of the Park's native vegetation. The vegetation type and fire and grazing history determine the degree of weed invasion. One measure of the degree to which introduced species have infiltrated different vegetation types can be seen in Table 5. Once annual weeds are established a cycle may be set up where rapid growth in winter and spring results in a greater fire hazard in summer, and increased pressure for fuel reduction burning. Burning to eliminate weeds can often lead to further weed growth and degrade the vegetation. Apple of Sodom is the greatest weed problem in the Park and there has been a long continuous strip of Apple of Sodom in lot 5524, the newest addition to the Park. Significant reductions of Apple of Sodom have been made in the Park in the last two years. There are two known sites of Doublegee, three known sites of Cape Tulip and one major infestation of Cottonbush in the southern end of the Park. All of these have weed control programs in place.

Some introduced species, such as a fig tree near Martins Tank has cultural and historical value and will not need to be removed unless the species poses a threat to a native plant community, is a safety hazard or negatively affects Park values in some way.

Actions

1 **Liaise with the Agriculture Protection Board, landholders and local authorities regarding weed control on Park boundaries and adjacent properties.**

2. **Continue to maintain a register of all known occurrences and severity of introduced weeds.**

3. **Prepare and implement an introduced plants and weeds control program.**

4. **Monitor any effects of control programs on non-target species and make changes to procedures if required.**

6. **Clean machinery, vehicles and trucks before moving from areas with weeds into areas without weeds.**

17. FERAL ANIMALS

The objective is to minimise the impact of feral animals and feral animal control measures on Park values.

Introduced species include the House Mouse (Mus domesticus), the Black Rat (Rattus ratrus), the Fox *(Vulpes vulpes),* the Rabbit (Oryctolagus cuniculus), Feral Cat *(Felis* catus) and Goat (Capra hircus). The Feral Pig (Sus scrofa) has been seen outside to the east of the Park. Rabbits are common in the dune areas along the Old Coast Road and west of Lake Preston. A baiting program by the Agriculture Protection Board in 1986-87 greatly reduced Rabbit numbers for a while, but more recently their numbers have increased again, which have affected efforts by owners of property to the south of the Park, to rehabilitate damage in the dunes.

The Fox and Feral Cat are a major threat to native animal populations. CALM is researching safe and effective ways to reduce Fox populations. These include poisoning and biological control. Fox predation has accounted for a high percentage of deaths of captively bred and released native fauna such as the Western Ring-tail Possum in coastal areas further south. The Agriculture Protection Board is currently running a program to control the Fox in areas of private property near the Park. The use of 1080 baiting has reduced Fox numbers while not affecting native fauna.

Actions

1 **Continue to liaise with** the **Agriculture Protection Board, local government authorities and surrounding land holders to control feral animals and to educate landholders of the impact of feral animals including foxes, cats and dogs on native wildlife.**

2. **Expand the Rabbit control program to include areas under rehabilitation and ensure chemicals used do not affect native fauna.**

3. **Monitor feral animal populations and regularly assess the effectiveness of control programs and their threat to native flora and fauna.**

4. **Implement comprehensive feral animal control programs in conjunction with native fauna release programs.**

18. FIRE

The objective is to protect people, property and conservation values in and near the Park by appropriate fire management and suppression techniques.

Wildfire threat in and around Yalgorup National Park has been analysed and a strategy that considers values at risk, chance of ignition and suppression response capability has been adopted.

Values at risk include three townsites, other populated areas, property, pine plantations, historic sites, apiary sites and sensitive flora and vegetation groups. Semi-rural subdivisions adjoin the Park to the north at White Hill, Lake Clifton, Clifton Downs and Yalgorup Parklands. Three coastal towns are located adjacent to the Park: Melros to the north, Preston Beach in the middle and Myalup to the south. Peak visitor use of the Park and the holiday cottages in the coastal towns coincides with the summer high fire risk period.

Conservation values such as important plant species locations and animals whose habitats can be manipulated favourably, are considered when planning any fire management program. A mosaic pattern of various burning treatments helps to maintain high species diversity and provides an opportunity to incorporate strategies to protect or enhance conservation values. Burning in the Park adjacent to private property, may encourage weed invasion into the Park as many species of weeds can out compete native species in recolonisation of burnt areas and in autumn exotic grasses carry mature seed (CALM, 1994).

Tuart regeneration is an important long-term goal for many areas of the Park and is discussed in greater detail in the next section. Fire sensitive species such as *Lasiopetalum membranacewn,* are on occasions isolated and left unburnt. Buffer areas around the lakes are left unburnt for as long periods of time so as to maintain vegetation density which filters nutrients that might otherwise enter the lake and to protect nesting areas (Traun, 1986).

The fire protection strategy for Yalgorup is to prevent wildfires from burning large sections of the Park. This is facilitated by maintaining a system of low fuel buffer areas. The lakes and the Indian Ocean provide natural barriers to the spread of fire from and to the east or the west. The Park is divided into areas in which it is proposed that fuels will be of varying ages. Strategic areas are burnt to minimise the risk of fires spreading within the Park for any great distance in any direction. Buffers will also be burnt to protect Park facilities and adjoining land. The frequency of burning fuel-reduced buffers depends on the natural fuel accumulation rate of the area, and generally in open stands like the Tuart forest, that means a return time of six to 10 years.

Fuel reduced buffers are at least 500 metres wide and may be created by either burning or slashing or a combination of these operations. Often slashing is a better alternative to burning when the risk of weed invasion is high. Fuel reduced buffer areas are located to protect people, property, adjacent property

land and undeveloped private lands. Management tracks are maintained along buffer boundaries to ensure rapid access for fire fighting forces.

Vegetation management areas are designated in which a range of fire treatments can implemented for each vegetation type so that there is a diversity in vegetation structure habitat types. An extensive fire that burns most or all of any major vegetation association is considered undesirable.

Three types of fire management regimes are to be applied. These are contained in the following areas shown on Map 6.

1. Fuel reduced buffer areas - Areas generally at least 500 metres wide and burnt to assist protection of people, property and conservation values.
2. Vegetation management areas- Areas that are burnt as required to regenerate species within a vegetation complex, or provide or protect specific habitats.
3. Scientific study reference area - Areas from which fire will be excluded, and subject to scientific research input and advice.

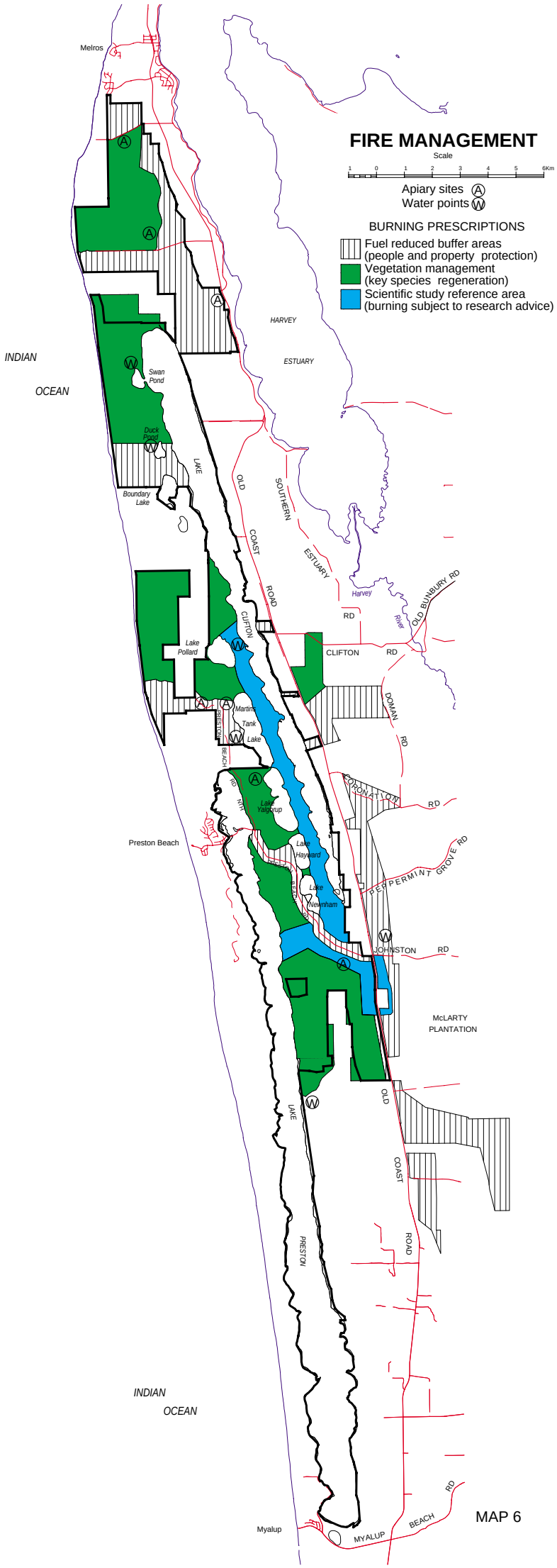
Fire detection in the Park during the fire season is provided by CALM, Park neighbours, the Park ranger and other district staff. Every effort is made to contain wildfires threatening the Park to the smallest possible area to protect human life, property and Park facilities. Close cooperation with the Waroona and Harvey Shire Councils, City of Mandurah, Bushfires Board and Brigades, and Park neighbours should be continued so as to integrate fire prevention, detection and suppression efforts. A fire danger board will be placed along Preston Beach Road and at other suitable locations. On days of extreme fire danger, Park staff will undertake patrols. Water supply points are considered adequate. The locations of these are indicated on Map 6. Fire fighting operations will be undertaken in such a way as to minimise environmental impacts, wherever possible.

A cooperative approach with local Bush Fire Brigades, local government authorities and neighbouring landholders is encouraged so that responsibility for wildfire control and prescribed burning is shared. Mutual aid arrangements with the Bush Fire Brigades will be encouraged to ensure an effective fire fighting force is in place.

Prescribed burning will be implemented in accordance with a master burning plan which sets out work to be done for the Park in any one year and is reviewed annually in the light of wildfires and new research information. Any changes to the burning plan will be made in consultation with Bush Fires Brigades, the Bush Fires Board, the Fire Advisory Committee, and other relevant organisations.

Actions

1 **Implement prescribed burns in accordance with the master burning plan. Implement a range of fire regimes, including variation in season, intensity and size, particularly between different blocks according to the fire management plan (Map 6).**


FIRE MANAGEMENT
Scale
1 0 1 2 3 4 5 6Km
Apiary sites Ⓐ
Water points Ⓦ
BURNING PRESCRIPTIONS
Fuel reduced buffer areas (people and property protection)
Vegetation management (key species regeneration)
Scientific study reference area (burning subject to research advice)
Melros
INDIAN
OCEAN
HARVEY
ESTUARY
Swan Pond
Duck Pond
Boundary Lake
LAKE
OLD
SOUTHERN
COAST
ROAD
ESTUARY
Harvey
River
OLD BUNBURY RD
RD
CLIFTON
CLIFTON RD
Lake Pollard
Martins Tank
Lake
PRESTON BEACH RD NTH
DOMAN RD
CORONATION RD
Lake Yangedup
Preston Beach
Lake Hayward
Lake Newnham
PEPPERMINT GROVE RD
JOHNSTON RD
McLARTY PLANTATION
OLD
LAKE
COAST
ROAD
PRESTON
INDIAN
OCEAN
Myalup
MYALUP BEACH RD

MAP 6

request). The frequency of prescribed burns will depend on the succession of litter accumulation and protection, regeneration and conservation requirements.

3. **Strategically placed fuel reduced areas will be maintained, rather than narrow buffers, along private property boundaries. Where possible successive burns in each block will be programmed in different seasons.**

4. **Roads required for fire control and essential management activities will be defined and maintained to suitable standards. Firebreak construction will be kept to a minimum. Those roads considered unsuitable for public use will remain closed to the public (See Section 22).**

5. **Continue to liaise with local government and the local Bush Fire Brigades to ensure an effective fire fighting force is in place. Establish agreements with adjacent landholder agencies, where necessary, regarding a cooperative approach to carry out fuel reduction requirements. If conditions or land responsibilities change, review agreements or establish new agreements to ensure ongoing protection.**

6. **Contain all fires in or threatening the Park, considering values at risk, disease risk, fire behavior, resources, the presence of low fuel areas and ecological values. Suppression actions may include direct attack, backburning from established roads or buffers, or by allowing the fire to burn out to low fuel buffers.**

7. **Actively promote public education and awareness of fire risk, safety and survival through pamphlets, information boards and personal contact by Park staff.**

19. TUART

The objective is to promote long-term stability of Tuart stands in the Park.

There is concern that historical land-use practices and fire management of areas within the Park since colonisation may have caused changes in the balance between Peppermint and Tuart in some stands in the Park, favouring Peppermint (pers.comm. Neil Burrows). If this is the case, then active intervention may be necessary to prevent further decline of Tuart in these stands. Care needs to be taken to ensure that any intervention is based on sound knowledge and that any techniques used do not cause damage to the **understorey or effect fauna species** associated with it, such as the Ring-tailed Possom. The best approach is to initiate research on:

- the natural variation in the balance between Peppermint and Tuart in different habitat within the Park,

ACTIONS

1 **Initiate research to study the effects of land-use and fire management on the population dynamics of Tuart to determine whether or not Peppermint is replacing Tuart in some stands.**

2. **Select recruitment methods that do not adversely effect other Park conservation values such as habitat requirements for the Ring-tailed Possum.**

3. **Seek NPNCA approval of recruitment methods before they proceed, if research shows that intervention is necessary.**

20. RECREATION STRATEGY

Popular features of Yalgorup National Park are its trees, lakes, landscapes, birds, vegetation and natural settings. Visitors enjoy the Park's natural and undeveloped qualities. It is important that these qualities be retained for present and future generations to enjoy.

Greater pressure will be exerted on CALM to provide recreation opportunities in the northern part of the Park as Mandurah expands. The City of Mandurah has experienced high growth with a ten-fold population increase since 1961. Over 67% of the Peel Region's population is located within the City of Mandurah. Population projections, prepared by the Department of Planning and Urban Development in 1988, estimate the population of the Peel Region will grow to over 70 000 by the year 2001 and increase to nearly 90 000 by the year 2011 (SWDA, 1991). Present sites will need to be expanded and new areas developed to facilitate the larger numbers of people and provide new avenues for discovering the Park. This will involve making visitors more aware of the Park and its values. Park values most vulnerable to inappropriate recreational activities include Lake Clifton's stromatolites and thrombolites, waterbirds, vegetation complexes and the Quindalup Dune System, which is very prone to destabilisation.

A visitor and neighbour survey was conducted over the Easter and school holiday period, April to May 1992. Its purpose was to assess the types of groups using the Park, the major activities occurring, and visitor attitudes towards facilities. The survey form also had a section that allowed visitors to express their opinions about the Park and how it could be improved. The results of the survey helped to determine the recreational strategy proposed in this draft plan.

Another survey was carried out over a number of years to determine the growth of recreational demands. Recreational activities were observed and recorded by Park Rangers during 1988, 1989 and 4 months in 1990. Table 6 shows some of the most common activities from 1988 to 1990.

Low impact activities and those that increase awareness, appreciation and understanding of the natural environment will be encouraged in the Park. Better provision of information is required as well as new recreational opportunities, facilities and experiences for visitors. Areas degraded by present use will be upgraded by providing new facilities or rehabilitating old ones, or a combination of both.

A wide range of recreational activities occur in the Park. The implementation of a zoning system is proposed in the Yalgorup National Park to cater for these activities. The land area will be divided into zones ranging from those with very high environmental protection value where only walking will be permitted, to zones of lower environmental protection value. In zones where only walking is permitted a special emphasis will be made on the observation wildlife. The recreation zoning will reflect conservation values. Zoning on the

TABLE 6. OBSERVATIONS BY PARK RANGERS

ACTIVITY	1988 % 12 Mths	1989 % 12 Mths	1990 % 4 Mths	Average %
Sightseeing	19.6	23.5	26.8	23.3
Walking	21.0	20.0	20.2	20.4
Camping	11.7	14.2	21.9	15.9
Seeking Information	13.2	11.1	10.9	11.7
Barbecuing	13.0	8.9	5.8	9.2
Picnicking	10.6	5.8	4.1	6.8
Fishing	3.2	6.7	4.4	4.8
Photography	3.4	4.8	1.7	3.3
Birdwatching	1.8	2.8	1.9	2.2
Swimming in a lake	1.4	1.1	.7	1.1
Horse riding	1.0	1.0	1.5	1.1
Total No. of activities	1036	1117	411	

21. ATTRACTIONS AND EXISTING USE

The objective is to provide recreation opportunities in an equitable manner that do not impact adversely on the Park's values and that maximise appreciation and enjoyment of those values.

Yalgorup National Park contains a diverse and unique terrestrial and aquatic natural environment. This provides abroad range of recreational opportunities. The area is used for sightseeing, bushwalking, barbecuing and picnicking. The user survey showed that sightseeing and picnicking are the two most popular activities in the Park.

The Park's lakes and wetlands attract activities such as photography, painting and sketching. The area also displays a great diversity of birdlife that attracts birdwatchers and photographers. Other users visit the Park to view the wildflowers, stromatolites and thrombolites. The popularity of these activities indicates a need for walks and lookouts.

A number of water-based activities occur in the Park including swimming, boating, canoeing, waterskiing, sailing and fishing. These activities are permitted only in Lake Preston and in the ocean adjacent to the Park.

The close proximity of horse properties also encourages horse riding in the Park's vicinity. Proposals for management of this activity are discussed later in this plan. Areas used by four wheel drive vehicles and motorcycles are strictly managed and controlled. This activity in sensitive areas can cause damage to the Park's vegetation and landscapes and is therefore restricted. The use of vehicles within the Park must be limited, as the Park contains only relatively small areas of land that can assimilate the environmental damage that can be caused by them.

The following activities occur:

sightseeing camping seeking information

No detailed data on visitor numbers are available. Traffic counter data will be important to assess the increasing use of the new camping area at Martins Tank Lake. The use of Martins Tank camp ground fluctuates from very little use to high levels of use, particularly over the Christmas period, with moderate levels of use over long weekends and Easter. Traffic should be monitored and road conditions well maintained along Preston Beach Road, Preston Beach Road North, White Hill Road and Tims Thicket Road, as these are the most frequently used access roads into the Park.

Actions

1. **Liaise with Park visitors to identify their specific needs and determine if and how opportunities and facilities to meet these needs can be provided.**

2. **Assess requests to use the Park for new recreational pursuits using the following criteria:**

- **suitability in a national park**
- **suitability in the Regional context**
- **compatibility with existing uses**
- **likely environmental impact**
- **availability of alternative opportunities**
- **management capability.**

3. **Monitor the impacts of all activities in the Park and make any necessary changes to management practices if unacceptable impacts are found to be occurring.**

4. **Investigate opportunities for increasing public awareness and enjoyment of Park values.**

22. ACCESS

The objective is to provide and maintain access to the extent that the Park's values are not adversely affected.

The main access to Yalgorup National Park is via the Old Coast Road, which is a major arterial road to the east of the Park. The type of road access available influences the level and intensity of use of an area. Areas that are sensitive, therefore, should have access provided that can be managed so that the Park's conservation and environmental values are protected. Monitoring road access will be important to determine management actions.

The main picnic sites in the Park, at Lake Preston and Hayward, are accessible by two wheel drive from Preston Beach Road. The only camping site in the Park, at Martins Tank Lake, is also accessible by two wheel chive. A number of foreshores at Lake Clifton and Lake Preston are accessible by two wheel drive. However, no facilities or interpretive information exist at these locations. Coastal access at the end of White Hill Road is by foot, horse or by four wheel drive. At present, North Preston Beach Road continues on

Access for equestrians is proposed to link the beach and the 10th Lighthorse Brigade Trail using fire breaks between the Park and private property. It will be important that the management tracks are maintained to a level sufficient for fire suppression activities or other management requirements.

The desire for more access was expressed in the user survey and in the neighbour survey. Strong support also exists for more walk tracks. The recently acquired location 5524, north west of Lake Clifton, would be a good location for a series of walk trails. A long distance walk for backpackers and a shorter walk for day users could be established through the area cater for different users and their needs. An access track for private landholders an management purposes is available for limited and authorised use in this area. A walk track from Martins Tank camp ground to Lake Pollard and back could be established. This walk is

already used by bushwalking groups in the late summer when the Black Swans are in large number at Lake Pollard.

In addition to those access routes identified for retention, there are a number of small tracks in the Park that serve no management or public access purpose. These will be assessed for possible closure and rehabilitation.

Greater pressure will be placed on the existing access and any additional access provided in the future, as visitor levels increase. All new access must be able to sustain this increase, and increasing types of access provided in the northern section of the Park will need to be accompanied with increased CALM presence in that area.

Almost all visitors to Yalgorup National Park use vehicles to arrive at their destinations. Unregulated four wheel drive access has destroyed native vegetation and caused erosion in the Park, particularly in the coastal dunes. Of major concern for neighbours and management are the use of dune buggies and motorbikes in the Park. The Control of Vehicles (Off-Road Vehicles) Act 1978 could be used both by CALM and local government Rangers, to prosecute those using restricted areas. Non-vegetated beach areas will continue to be available for responsible four wheel drive use. The newly established four wheel drive track from North Preston Beach Road to the beach will provide access for four wheel drive vehicles. In addition to erosion problems, four wheel drive vehicles have the potential to spread disease and weeds within the Park. It is important to educate drivers of these vehicles, with ‘code of the coast’ signs to encourage the use of low air pressure in their tyres and to stay away from vegetated dune areas.

Bicycles are also used on roads and tracks along the lakes. This type of activity is compatible with other uses and values of the Park.

Actions

1. **Confine public vehicle access to developed roads and tracks where possible.**

4. **Provide two wheel drive access within walking distance of the beach by continuing North Preston Beach Road closer to the beach, and investigate the possibility of allowing four wheel drive access to the beach (Map 8 Prop. new access).**

5. **Prepare detailed plans and specifications for all proposed tracks and parking areas in accordance with accepted design principles and Departmental standards. These include:**

- **Design and develop any new access routes as low in the topography as possible and in a manner that complements Park landscapes while maximising scenic opportunities (Section 13).**

- **Locate and design access routes in the Park so that they do not degrade surface and groundwater quality.**
- **Conduct a full disease assessment of all areas in which track reconstruction will occur.**
- **Develop and maintain access routes in ways that minimise the risk spreading disease.**

6. **Monitor, in association with user groups and local government, all four wheel drive tracks, access to four wheel drive beaches, the use of dun buggies and motorbikes and instigate management action as necessary**

7. **Progressively develop a varied system of walking tracks within the Park, distinct from tracks for vehicles or horses.**

8. **Maintain management tracks to a level suitable for visitor convenience and management requirements.**

9. **Provide access close to a safe area of beach that is vehicle free.**

10. **Provide access for motorised vehicles on roads and tracks developed an maintained to Departmental standards.**

11. **Direct motorised vehicles to the most appropriate areas, close unsuitable, roads and tracks and prescribe conditions of use that will minimise environmental and social impacts.**

12. **Restrict vehicles to using any vegetated beach areas between the low an high water marks and discourage access into vegetated foredunes with signs and road closures.**

13. **Provide information to Park users on appropriate four wheel drive techniques for coastal areas.**

14. **Identify existing access roads and tracks suitable for bicycle riding.**

The areas surrounding Yalgorup National Park have been used by horse riders for about 1 years. Horses have been kept and run in the area since the early 1850s when the area w first settled.

Numerous people living close to Yalgorup National Park own horses. Some neighbours have expressed a desire to be able to ride in the Park and have suggested designated horse riding trails be established. Horse riding is common throughout the area and some riding occurs inside the Park, although it is not an approved activity. At present a number of horse riders follow road reserves down to the beach to exercise their horses. The 10th Light Horse Bridle Trail, from Island Point South, also runs along the outside of State forest, which the Central Forest Region Regional Plan proposes to add to the Park.

The two main groups of horse riders are from the White Hill Road and the Mount John Road areas. The Mount John Road group would like beach access and the White Hill Road groups would like access to the 10th Light Horse Bridle Trail. Interest has been expressed for operating commercial horse and camel riding in the Park. This activity could be permitted on the Park's Bridle Trail subject to conditional licensing (See Section 32 Tourism).

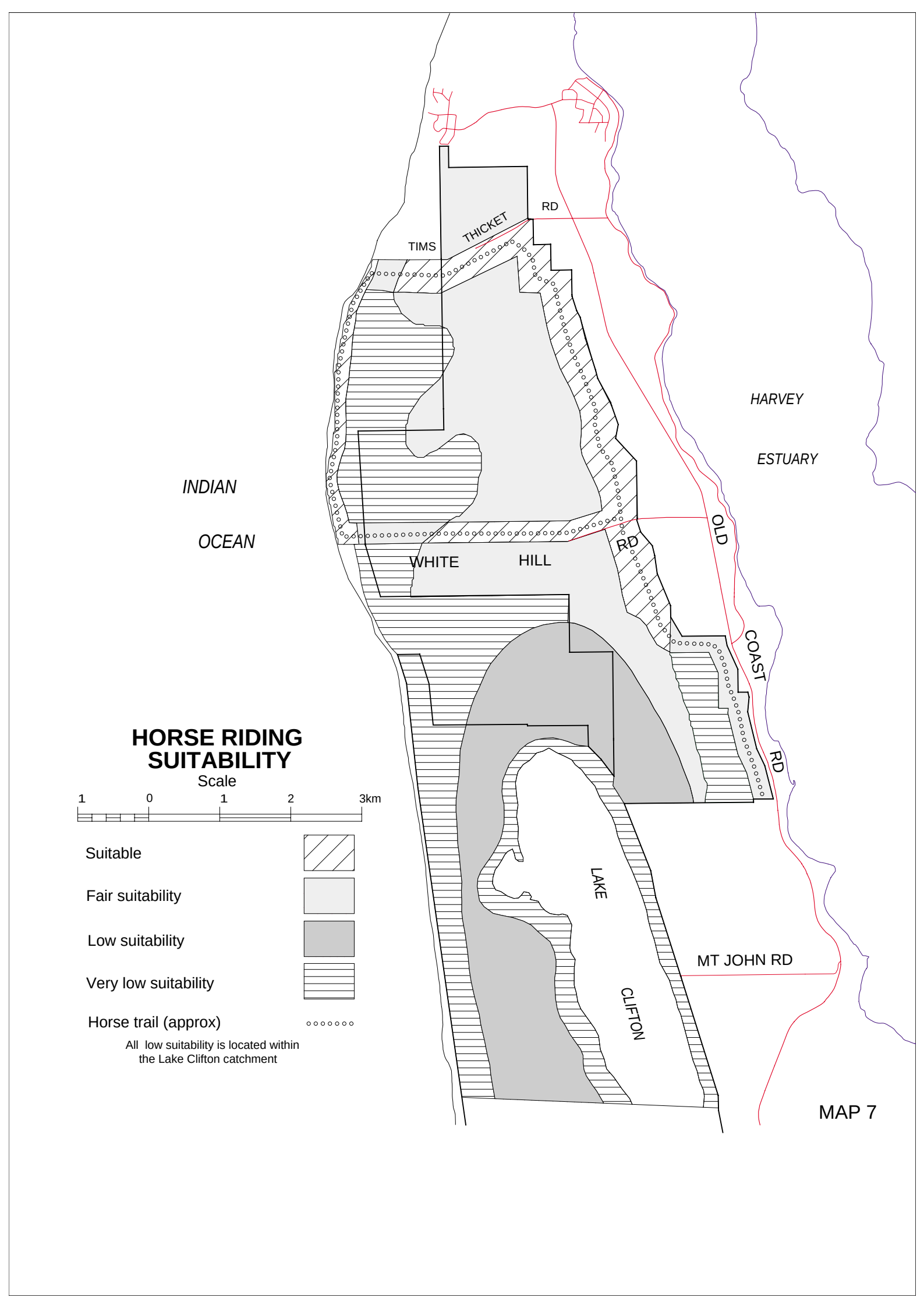
Horses have the potential to spread weeds and disease into unaffected areas and trample and browse on native vegetation. Horses fed on commercial food sources are less likely to spread weeds than horses grazing in paddocks that contain weeds. The potential to spread weeds inside the Park is less with horse riding trails which follow the boundaries of the Park rather than those which go through the Park.

The potential for horses to spread disease is generally greatest during wet conditions when infected soil can be moved in hooves from one place to another. The vegetation complexes contained in the Park have a low predicted impact from dieback with a moderate impact in a small area of Karrakatta complex. Any designated horse trail would be managed according to strict dieback hygiene principles. Hygiene measures such as signs requesting cleaning hooves before entering the Park could be put into place.

Horses can also foul watercourses with their droppings. Locating a bridle trail outside the catchment boundary will avoid this. The area inside Lake Clifton's catchment boundary is not considered suitable for a horse riding trail (see Map 7).

A good opportunity exists in Yalgorup National Park to separate horses, vehicles and walkers (Map 8). Increasing access for vehicles and walkers is being provided for in other areas of the Park (See Sections 22&24). Access to the beach is well established along the Tims Thicket and White Hill mad reserves and horseriders would be able to ride safely off the edge of the roads using the proposed horse riding trail.

It is proposed that horse riding be allowed on a designated trail outside the Lake Clifton catchment boundary, on the edge of road reserves and on the outside boundary of Yalgorup National Park. Consideration will also be given to priority flora locations, to determine an exact location for the horse riding trail


HORSE RIDING SUITABILITY
Scale
1 0 1 2 3km
Suitable
Fair suitability
Low suitability
Very low suitability
Horse trail (approx)
All low suitability is located within the Lake Clifton catchment
INDIAN OCEAN
HARVEY ESTUARY
TIMS THICKET RD
WHITE HILL RD
OLD COAST RD
LAKE CLIFTON
MT JOHN RD
MAP 7

ACTIONS

1. **Establish a code of ethics for horse riding elaborating on horse care and control to minimise any impact within the Park.**

2. **Further assess the land's capability and suitability for horse riding and determine the exact location of the trail.**

3. **Permit horse riding in the Park (including the possibility of commercial horse or camel rides) on a designated trail on the outside boundary of the Park (Map 7). No specific additional horse riding facilities will be provided.**

4. **Ensure that the designated horse trail Park entrance locations are well designed and signposted to ensure compliance through information on dieback disease hygiene principles, weed invasion impact and the effects of horse activity on water quality.**

5. **Link the horse riding trail with the existing 10th Light Horse Bridle Trail.**

6. **Close tracks when maintenance work or rehabilitation is required.**

7. **Monitor the impacts of horse riding and modify or further restrict use if the activity appears environmentally unacceptable.**

8. **Encourage horse riding in areas outside the Park and its Lakes, such as pine plantations, which are able to sustain this activity.**

9. **Encourage horse riders to feed their horses on a seed free diet for 24 hours prior to entering the Park.**

10. **Require Park riders to display a license tag on their horse to show they have paid a registration fee. Use the fees to maintain horse riding trails.**

11. **Seek financial support from horse riding groups and neighbouring horse property owners to help establish and maintain the horse riding trail.**

24. NATURE OBSERVATION AND NATURE WALKS

The objective is to provide walks and observation points from which the Park's natural attributes can be viewed to enhance visitors' experience.

Yalgorup National Park with its large variety of vegetation and landscapes and unique wetlands and lakes provides a great opportunity to explore by foot

WALKING AND SIGHTSEEING IN YALGORUP NATIONAL PARK

Currently no designated bushwalking or nature walks are located in the Park. Many visitors are currently using management tracks for walking, and a few bushwalking groups regularly use the Park. The potential exists to provide more opportunities for bushwalking through designated nature walks that cater for a variety of users, their needs and levels of fitness. However, the placement of any walks must also consider erosion potential, spread of disease and impact on vegetation.

As already mentioned (Section 22), location 5524 north west of Lake Clifton in the Park is a possible location for a long and short walk and a lookout could be incorporated into both of these walks. The longer walk could have designated backpack camping areas. Other short walks would be located behind the information bay along Preston Beach Road, from the Lake Preston day-use area to Lake Preston, and from Martins Tank Camp Ground to Lake Pollard, A nature walk will be located at the end of North Preston Beach Road (see Map 8).

Viewing scenery and sightseeing is the most popular activity in the Park. Rangers observations show that the amount of sightseeing has continued to increase from 1988 to 1990 (See Figure 2). A part of sightseeing is being able to stop and view the scenery. No developed lookouts or vantage points are currently established in the park. Lookouts are proposed behind the information bay, at the end of White Hill Road, at the end of North Preston Beach Road and along the proposed walks through location 5524.

Yalgorup National Park displays a diversity of birdlife as well as the unique stromatolites and thrombolites that are found along the eastern side of Lake Clifton. In the user survey 16.7% of visitors wished for more information to be provided on the flora and fauna of the area. An observation facility to view the stromatolites and thrombolites is proposed at the end of Mount

John Road. The possibility of viewing facilities on Lake Preston, Lake Hayward and Lake Pollard will also be investigated. Birdwatching and photography are also popular in the Park with 45.8% of users and 80.6% of neighbours participating in either of these activities.

3. **Designate preferred backpack camping areas along the path network where appropriate and consider fresh water availability and well maintenance if practical (Map 8).**

4. **Provide safe access to points of special natural interest where this can be achieved without threat to the natural environment or visual landscape.**

5. **Locate a lookout at the end of White Hill Road and include relevant interpretive material.**

6. **Provide a nature observation facility at the end of Mount John Road for viewing waterbirds and stromatolites and thrombolites in Lake Clifton.**

7. **Design and develop a short nature walk from the Mount John Road dayuse area.**

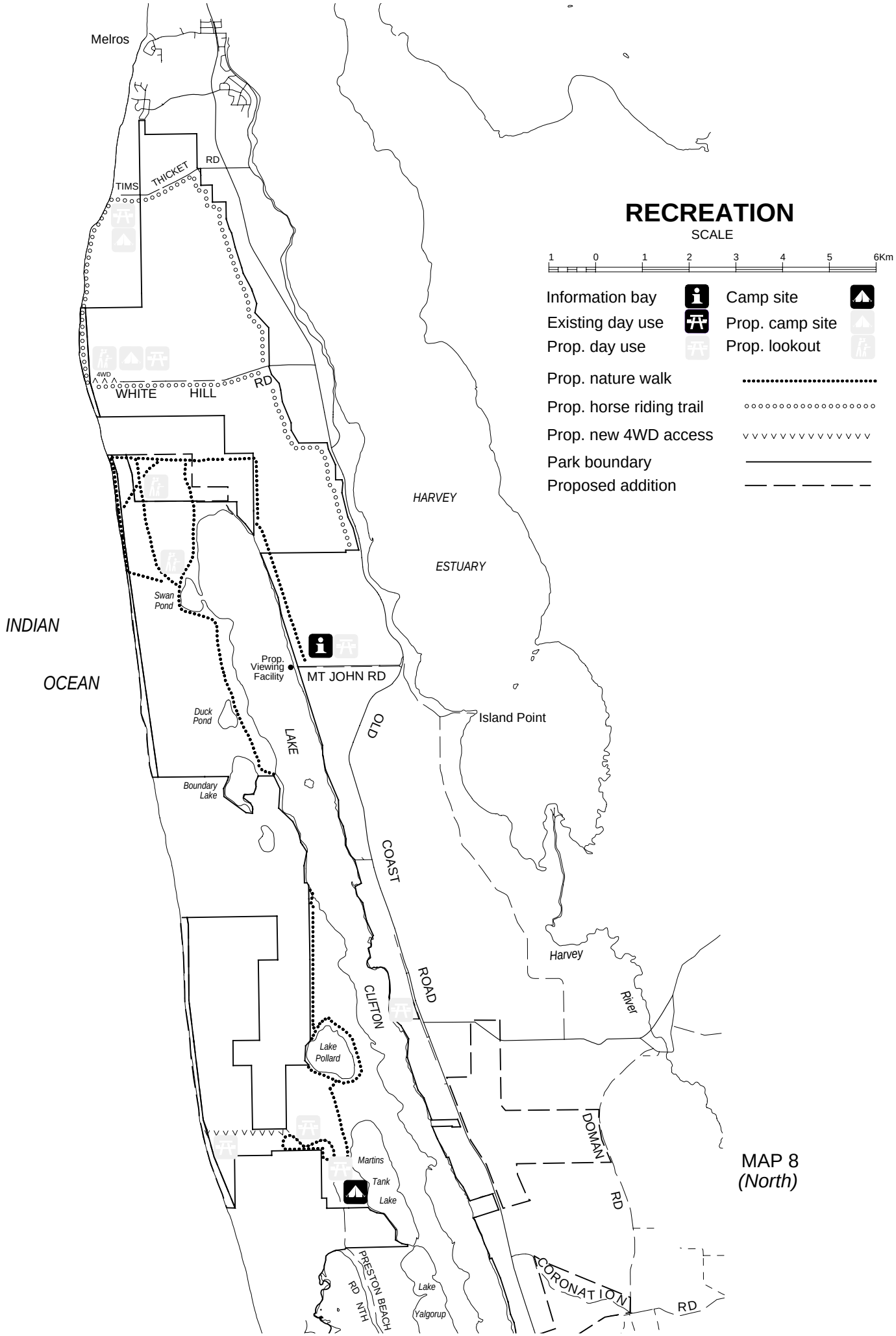
8. **Investigate the possibility of constructing waterbird viewing facilities at Lake Preston, Lake Hayward and Lake Pollard.**

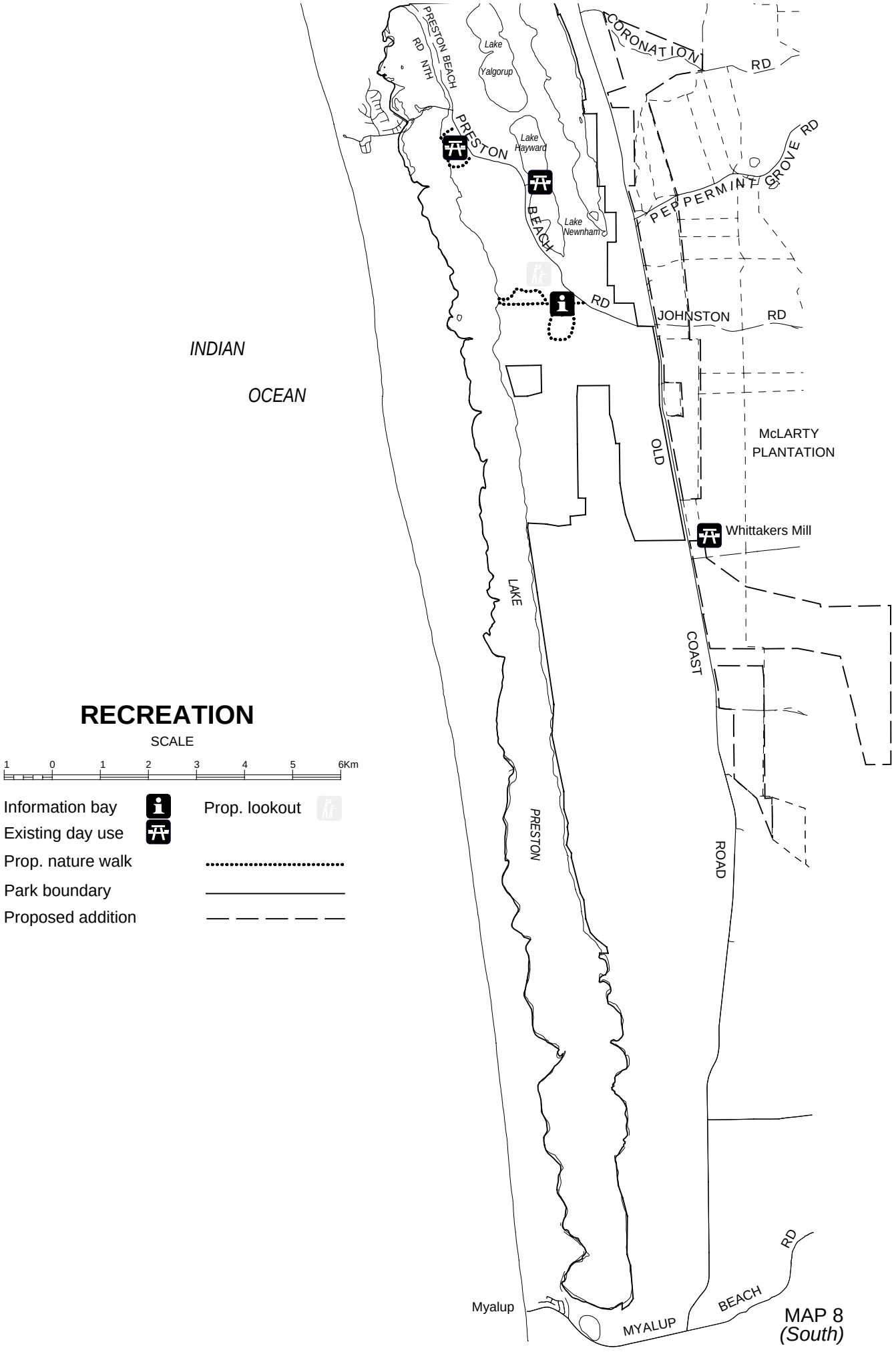
9. **Provide a walk loop to Lake Preston from the Lake Preston day-use area.**

10. **Provide a walk from the Preston Beach Road Information Bay to a lookout and to Lake Preston.**

11. **Develop a nature walk at the end of North Preston Beach Road which includes a lookout.**

12. **Develop a long walk from Martins Tank Lake north to location 5524 and around Lake Clifton to Mount John Road. Within this walk develop shorter loops around Lake Pollard and two varying length loops that each include a lookout in location 5524.**


RECREATION
SCALE
1 0 1 2 3 4 5 6Km
Information bay
Existing day use
Prop. day use
Camp site
Prop. camp site
Prop. lookout
Prop. nature walk
Prop. horse riding trail
Prop. new 4WD access
Park boundary
Proposed addition
Melros
TIMS
THICKET
RD
4WD
WHITE
HILL
RD
HARVEY
ESTUARY
Swan Pond
INDIAN
OCEAN
Prop. Viewing Facility
MT JOHN RD
Duck Pond
LAKE
OLD
Island Point
Boundary Lake
COAST
ROAD
CLIFTON
Harvey
River
Lake Pollard
DOMAN
RD
Martins
Tank
Lake
PRESTON BEACH
RD NTH
Lake
Yalgorup
CORONATION
RD
MAP 8
(North)


INDIAN
OCEAN
PRESTON BEACH RD NTH
Lake Yalgorup
CORONATION RD
PRESTON BEACH
Lake Hayward
PEPPERMINT GROVE RD
Lake Newnham
JOHNSTON RD
RD
OLD
McLARTY PLANTATION
Whittakers Mill
LAKE
COAST
PRESTON
ROAD
Myalup
MYALUP BEACH RD
RECREATION
SCALE
1 0 1 2 3 4 5 6Km
Information bay
Existing day use
Prop. lookout
Prop. nature walk
Park boundary
Proposed addition
MAP 8
(South)

25. DAY USE

The objective is to provide day-use recreation facilities appropriate to the environmental setting that encourage visitor enjoyment and understanding of the Park's values.

Day-use activities include picnicking, barbecuing, sightseeing, birdwatching, photography and sketching/painting. Picnicking and barbecuing are traditional activities in most national parks, either as a pursuit in its own right or as an adjunct to other recreational activities. Picnicking and barbecuing facilities are provided in the Park at Lake Hayward, Lake Preston and Whittakers Mill. (Map 8)

New picnic and barbecue facilities will be provided at Martins Tank Lake, White Hill Road, Mount John Road, the Lime Kilns, at a site north-west of Martins Tank, at North Preston Beach and at Tims Thicket and Melros if these reserves become part of the Park.

Actions

I Design and develop day-use sites and environmentally sensitive facilities in accordance with the Department's Policy Statement No. 18 Recreation, Tourism and Visitor Services and the Central Forest Region Regional Plan Day-Use Strategies.

2. Ensure that site development plans are completed and approved by the District Manager before development, maintenance or rehabilitation works are undertaken.

3. <u>Martins Tank</u> (High Priority)

- **Develop a day-use area at Martins Tank Lake for picnicking with a walk to Lake Pollard and further north.**

4. <u>Tims Thicket Road</u> (High Priority)

- **Designate a day-use area south of Tims Thicket Road if the site is added to the Park.**
- **Provide further day-use facilities south of Tims Thicket Road in a suitable location near the beach with a walk track to the beach if the site is added to the Park.**
- **Rehabilitate all unnecessary vehicle tracks and disturbed areas.**
- **Investigate the possibility of using old quarries for recreation after further rehabilitation, including earth shaping and revegetation.**

5. <u>White Hill Road</u> (High Priority)

- **Develop a day-use area at the end of White Hill Road with a lookout, picnic facilities, two wheel drive access close to the**

6. Lake Hayward (Low Priority)

- **Expand the existing day-use area if and when needed.**
- **Retain picnicking as the main activity at this site.**
- **If pedestrian impacts on the foreshore of Lake Hayward are detrimental to the lake environment, consider constructing a formal viewing platform.**

7. Lake Preston (Medium Priority)

- **Redesign the day-use area to provide for picnicking, walking and birdwatching on Lake Preston.**
- **Continue to rehabilitate the quarry at the Lake Preston day-use area.**
- **In the redesign, investigate the potential to expand if and when the need is demonstrated.**

8. Information Bay (High Priority)

- **Maintain information facilities at this site on Preston Beach Road, and consider including a toilet when the walk to Lake Preston and the lookout has been developed.**

9. Mount John Road (High Priority)

- **Design a day-use site at the end of Mount John Road with the main activity being to interpret the stromatolites and thrombolites in Lake Clifton.**

10. Lime Kilns (Medium Priority)

- **Provide vehicle access, parking, picnic facilities, interpretive information and toilets at the Lime Kilns while respecting the historical integrity of the site.**

11. Whittakers Moll (Medium Priority)

- **Continue to use the Whittakers Mill site as a day-use area for roadside resting and picnicking with allowance for does on a leash.**
- **Upgrade picnic facilities, rationalise road and tracks and provide toilets and historical information on site.**

12. North Preston Beach (Medium Priority)

- **Develop a day-use site near the beach and at the end of North Preston Beach Road. Provide picnic facilities in a suitable location if the need is demonstrated.**

13. Northwest of Martins Tank (Medium Priority)

- **Develop a day-use site that focuses on a nature walk. Provide information, interpretation and limited picnicking facilities.**

14. Melros Area if included in the Park (Low Priority)

- **Develop a day-use site for picnicking at Melros, if the area is included in the Park.**

26. CAMPING

The objective is to provide for and encourage low-impact camping in designated areas provided that the activity is sustainable and appropriate to the environmental setting.

Vehicle-based camping in the Park is formally provided at only Martins Tan amp Ground. The camp ground is situated on the banks of Martins Tank Lake on a cleared area among Tuart and Peppermint woodland. The camping site is located on a point on the western side of the lake. Martins Tank Lake is highly saline and few waterbirds have been observed on the lake in recent times.

Martins Tank is a natural and peaceful spot with numerous attractions nearby. Within walking distance is Lake Pollard and Lake Clifton which support large populations of birdlife. A walk trail from Martins Tank Camp Ground to Lake Pollard and back could be formally established.

Martins Tank Camping Ground is in the process of being redeveloped as a camp site in accordance with a Recreation Development Plan. The user survey shows that a small number of visitors camped in the Park over the Easter period of 1992. It is expected that the numbers will increase at this camp ground as more people become aware of its location. The most frequently used day-use areas and the Information Bay should be used to promote the camp ground.

The camp ground has a toilet block, various levels of camping bays with fire rings, and picnic tables. It caters for large group camping and has a number of small group sites. The Recreation Development Plan indicates an area where further development can be undertaken if and when the camp ground needs expanding.

A fee is payable to the Ranger. A self registration fee collection system is proposed for the camping ground to allow the Ranger more time to manage other areas of the Park.

Recreational activities were observed by Park Rangers over 1988 (1036 activities), 1989 (1117 activities) and for 4 months in 1990 (411 activities). The recordings show that on average camping was the third most often observed activity out of 11 activities (Table 6).

CAMPING IN
YALGORUP NATIONAL PARK

The percentage in Figure 3 represents people involved in camping activities compared to all 11 recreation activities surveyed in the Park.

Another area suitable for a camping site is at the end of Tims Thicket Road. Ibis possible camping site is within the Tims Thicket Reserve, and would be a valuable addition to the Park. An alternative to this camp site is at the end of the two wheel drive access along White Hill Road.

Backpack camping could be provided at designated sites along the proposed walk track north of Lake Pollard, within location 5524. These backpack camping sites would provide overnight opportunities for long distance walkers within the Park.

Actions

1. **Design and develop camping sites and facilities in accordance with the Department's Policy Statement No. 18 Recreation, Tourism and Visitor Services and the Central Forest Regional Plan Camping Strategies.**

2. **Ensure that site development plans are completed and approved by the District Manager before development, maintenance or rehabilitation works are implemented.**

3. **Continue to collect camping fees in the Park to help offset the cost of providing and maintaining facilities.**

4. **Investigate the use of a self-registering system.**

5. **Maintain liaison with individuals and organizations who provide campgrounds on nearby or adjacent lands.**

6. **Permit backpack camping in designated sites along the long walk track in location 5524.**

7. **Cater for a range of camping requirements, such as small and large groups, within the Park and investigate group camping arrangements that include vehicles in the group camp.**

8. **Design camping sites and facilities to ensure that potential risks toil visitors and the impact on Park values are minimised.**

9. **<u>Martins Tank</u> (High Priority) Continue site development at Martins Tank Camp Ground in accordance with the Recreation Development Plan.**

10. **<u>Tims Thicket Road</u> (High Priority)**

- **Designate a camping area south of Tims Thicket Road if the site is added to the Park.**

27. WATER BASED ACTIVITIES

The objectives are to:

- **Provide for water-based recreation activities that are compatible with protecting and maintaining conservation values.**
- **Provide for water-based recreation without impairing other recreation activities.**

Recreation activities occur on Lake Preston in the far south of the Park. The Lake has been divided into three recreation zones:

1. No boating or swimming
2. Canoeing only
3. Motorized boating and sailing (Map 3).

This helps to cater for the various activities and to minimise conflicts.

To protect the stromatolites and thrombolites no activities (other than scientific) are permitted on Lake Clifton. Currently no water-based activities are allowed in any of the Park's lakes other than Lake Preston. Rangers have observed people swimming in Lake Clifton and Lake Hayward and this activity is likely to disrupt the ongoing processes responsible for the microbialites and algal mats (See Section 10). Information can be provided at the lakes, to inform visitors of lake conservation values and why swimming is prohibited. At the same time, visitors could also be directed to other locations for swimming and boating, such as the ocean or estuary.

Beach fishing and swimming are very popular recreational activities along the coast, adjacent to the Park. The proposed track from North Preston Beach Road would open up new fishing and swimming locations. Because some fish run at night, fishermen will be allowed to rest in vehicles on the beach during this period. However, the use of tents and other camping equipment will not be permitted. Resting will not be allowed in the foredunes.

The Bunbury Water Ski Club has been operating in the southern end of Lake Preston since 1967. The Club is a fairly small group operating in a sensitive area. To control the impact of skiing the group should be kept small. Motorized boating and sailing in Lake Preston is restricted to an area shown in Map 3. Canoeing is also restricted to the southern end of Lake Preston (Map 3). Access for small boat launching is either from the Water Ski Club or from a public boat launching facility further north on the western foreshore of Lake Preston. Few sites are suitable for boat launching due to the shallowness of the water. It is not expected that further sites will be either warranted or permitted. An additional area for canoeing may be created at Martins Tank Lake and zoning extended to include the entire lower third of Lake Preston if the environmental impact of canoeing on each of these lakes can be shown to be minimal and manageable.

Actions

1. **Retain the waterskiing zone, access by the Bunbury Waterski Club and access by the public boat launching facility on Lake Preston subject to monitoring environmental impacts.**

4. **Monitor the effects of water-based recreation activities** on **the environment and modify the activities if necessary.**

5. **Permit "overnight resting" in vehicles along the beach adjacent to the National Park for people beach fishing. "Overnight resting" is defined as sleeping in, or next to a vehicle for no more than one night. This recommendation will be subject to the coastal strip adjacent to the National Park being added to the Park and will be subject to periodic review once in place.**

6. **Consider introducing some form of conditional canoeing in Martins Tank Lake, and extending zoning for canoeing to include the entire lower third of Lake Preston, after an assessment has been made to determine the environmental impact canoeing will have on each of these lakes.**

28. **PETS**

The objective is to protect the Park and its users from the negative impacts pets.

Domestic pets are generally not permitted in national parks. This is to protect native fauna the rights of other Park users. Pets disturb wildlife and Park visitors, can introduce disease and foul recreation sites. The smell of domestic pets can impede native fauna activity. Walking pets along management tracks within the Park is one activity observed by Park Rangers. Other than guide dogs for the blind, or tracker dogs for search and rescue, pets will continue to be excluded from the Park with the exception of the recreation area at Whittakers Mill and the beach area near the Preston Beach townsite. Whittakers Mill is a popular stop for people travelling between Perth and Bunbury. Pets are often observed there and will continue to be permitted if the area becomes part of the National Park. The coastal strip adjacent to the National Park is also proposed to be added to the Park. Pets will continue to be allowed on the beach adjacent to the Park near the Preston Beach townsite.

Actions

1. **Provide information to Park visitors explaining the Department's policy on pets, and enforce the policy.**

2. **Encourage the use of areas outside the Park, that are able to sustain activities such as pet exercising.**

3. **Allow dogs, on a leash, at the Whittakers Mill recreation area, which is proposed for addition to the National Park. If adjacent Park beaches at Tims Thicket, White Hill and Preston Beach are included in the Park, zoning for pets will be considered in consultation with the public. Pets will not**

PART E. COMMUNITY RELATIONS

29. INFORMATION AND INTERPRETATION

The objective is to increase awareness, appreciation and understanding of the Park's values and management, and encourage responsible use of the Park.

To achieve the objectives for managing Yalgorup National Park, an effective information and interpretation strategy is essential. It will increase the level of community awareness and understanding of the value of natural areas and their appropriate use. It will inform users of attractions and facilities available in the Park.

Currently, little information is publicly available on the Park and there are no established interpretation sites. Visitor surveys indicated that there should be a visitor information booth, and visitors as well as neighbours requested that more information be provided on the area's flora and fauna.

A display board is located at an information bay along Preston Beach Road, at the entrance of the Park. Information about the area's flora and natural history is provided. A map of the area is included.

Smaller information facilities could also be established at the four existing recreational sites and at White Hill Road, Mount John Road and Lime Kilns. The first new information/interpretation facility could be at a lookout established at the end of White Hill Road. Suggested information provided at the lookout would be about the actual site and also about attractions in other areas of the Park, such as Martins Tank Camping Ground. A second new facility could be a nature observation platform at the end of Mount John Road. This site could include information on the ecology and formation of the stromatolites and thrombolites, and other attractions and activities in the Park. Another new site could be at the Lime Kilns, just off the Old Coast Road. An interpretation site could be established here with information on the history of the kilns, and a photo or drawing of what they used to look like. These information/interpretation sites could be used to inform visitors of other attractions and recreational activities in the Park, encourage them to visit other areas of the Park, and inform them of conservation values and minimal impact recreational practices. Sponsored activities during peak visiting periods would also be a good way of educating visitors not familiar with the area.

Information could also be located at Lake Clifton and Lake Hayward informing visitors of the high conservation value of the lakes and why water-based activities are prohibited. Nature based information could be incorporated into a nature trail at the end of the two wheel drive road on

TABLE 7. INFORMATION AND INTERPRETATION STRATEGY

LEVEL	LOCATION	POSSIBLE TYPE OF INFORMATION
1. Orientation	Tourist Bureaux key areas	Pre-visit information for trip planning. (adjacent regions-Metro).
	CALM office	Recreation opportunities in Dwellingup District. Maps, special activities. Special requests. Ecological updates.
	Preston Beach Road	Welcome to Yalgorup National Park. Where to go, what to see, Map, ecology, history. Regulatory.
	Whittakers Mill	Overview of Yalgorup National Park. History of area. Recreational opportunities.
2. Recreation Sites	North Preston Beach Rd and at Preston Beach	Code of the Coast. 4WD information. Coastal vegetation. Dune systems. Regulations.
	Martins Tank Lake	Ecology of lake – algal mats. Recreation – walk trails. Cultural history.
	Lake Hayward	Ecology of Lake Possible impacts on the lakes. Birdlife.
	Horse Riding Trail	Horse riders ethics. Dieback disease. Regulations.
	Lime Kilns	European history of area. What happened at site. Recreation opportunities in other areas of Park.
	Mt John Road	Ecology of lakes: · stromatolites/thrombolites and benthos · birdlife · algae Possible impacts on the lakes. Recreation opportunities in other areas of the Park.
	White Hill Lookout	Vegetation complexes. Identify trees eg. Tuart, Peppermint. Recreational opportunities in other areas of Park.

A need exists for brochures and pamphlets about the Park to be distributed from CALM offices, within the Park and at strategic populated locations. Such pamphlets should provide brief information on the Park's values, facilities and attractions. Scientific groups such as the Stromatolite Advisory Group and the Royal Australasian Ornithologists Union should be involved in producing informative brochures. This information should be accessible for use in education and interpretation programs.

Actions

1. **Develop and implement a community education and interpretation strategy for the Park.**

2. **Liaise with scientific study groups to develop an information base for use in education and interpretive programs.**

3. **Build small information/interpretation facilities at Mount John Road, Lake Hayward, Martins Tank, White Hill Road, and at the Lime Kilns as funds become available.**

4. **Prepare and make available publications such as a brochure to inform schools, the public, and local landholders of the intrinsic value of the Park's lakes and constraints on activities permitted within the Yalgorup catchment.**

5. **Conduct seminars and information days for the public and landholders.**

6. **Provide information on opportunities for various types of day-use recreation activities both in the Park and on other lands in the area.**

7. **Provide information on points of scenic interest in the Park and provide interpretation at these points for visitors.**

30. EDUCATION

The objective is to facilitate and encourage the use of the Park by educational groups, maximise information dissemination and minimise impact on the Park's values.

Yalgorup National Park is a valuable educational resource. It provides visitors with the opportunity to learn about natural areas and the appropriate use of these areas. In July 1992 the Peel TAFE Winter Escapade Program ran a course on stromatolites at Lake Clifton. The course, conducted by CALM staff, was attended by over 20 people. Apart from considerable world scientific interest there is public interest in the Lake Clifton stromatolites, and further education material on the stromatolites and the Park should be made available to the public.

use of the Park for research and educational purposes. Groups of tertiary students also undertake guided tours around the Park and Lake Clifton area. Current tours given by CALM staff, lecturers, teachers and research scientists should be increased and consideration given to incorporating volunteers in this educational initiative.

Actions

1. Assist and encourage educational groups wherever appropriate.

2. Investigate the possibility of assisting the University of Australia to continue operating the Neville Stanley Field Station

3. Liaise with educational groups using the Park to review the education programs and set standards for appropriate research.

4. Liaise with program coordinators to modify any educational activities that may be having a detrimental impact on the Park's environment.

5. Consider the impact of any proposed Park management activities on educational programs.

31. COMMUNITY INVOLVEMENT

The objective is to develop, encourage and facilitate liaison with the community and their involvement in Park management.

A number of organisations and groups are interested in the management of Yalgorup National Park, State and local Government agencies, local residents, Park users, public interest groups and organisations involved with scientific work are all interested in the management of the Park. Continued liaison with groups such as Land Care District Committees and Progress Associations is important to achieve management objectives.

The Department will involve interested community members in education programs and in Park management. A Yalgorup National Park Advisory Committee has been formed, comprising representatives from relevant Shires, public interest groups and CALM. The role of this group was to advise on the preparation of the management plan. A further Advisory Committee or Strategy Group will be considered after the Plan is approved. Its role will he to:

- Advise on the Plan's implementation.
- Advise on issues referred to the committee (through the Regional Manager) by the Minister, the Department, or the NPNCA.
- Bring before the Department matters of concern or interest.
- Assist the Department disseminate information to the public

Friends of Yalgorup National Park, honorary CALM officers and camp ground hosts are possible ways of involving individuals and groups in Park management. Getting community cooperation in managing the Park makes the Ranger's job easier. The Royal Australasian Ornithologists Union has members who have helped count waterbirds and other birds in the Park. This is a good community involvement scheme in which CALM works very closely.

Actions

1. **Maintain and foster close communications and the active involvement of local individuals and groups interested in Yalgorup National Park.**

2. **Monitor community response to Departmental policies and management practices through both formal and informal contacts.**

3. **Identify recommendations within this Management Plan that can be implemented by community involvement.**

4. **Seek assistance from volunteers in education programs and to monitor and control weed species in the Park.**

5. **Encourage volunteer programs to help with rehabilitation work.**

6. **Consider establishing an Advisory Committee or Strategy Group to facilitate ongoing community involvement.**

PART F. COMMERCIAL AND OTHER USES

32. TOURISM

The objective is to encourage tourism in the Park that is environmentally and socially sensitive and, where possible, is of educative or interpretive value to visitors.

One commercial operator is issued with a permit to conduct camping excursions in Yalgorup National Park. Currently groups are taken from Martins Tank Camp Ground to Lake Pollard and Lake Clifton. An opportunity exists to extend this camping excursion into block 5524 along Lake Clifton in the vicinity of Boundary Lake, Duck Pond and Swan Pond. A camping excursion could start at Mount John Road and finish at Martins Tank Camp Ground.

Education in the practice of minimal impact camping techniques is part of the present excursions, and would be expected to be part of any further excursions. Along the west side of Lake Clifton, safe areas could be allocated for cooking fires, where tents could also be pitched comfortably and informal camping areas established. Locations near Swan Pond, Duck Pond and other waterholes, could be suitable for these purposes. Appropriate standards should be maintained by commercial operators not only to minimise any impact on the environment but also to inform their clients of the Park's values. Commercial horse and camel riding operations in adjacent areas to the Park have expressed interest in operating in the Park. This may be considered under a commercial operators license.

Presently no registered commercial day-tour operators are licensed to operate in the Park. A number of day-tours operate locally within the City of Mandurah and in the Peel Region. Operators conduct tours of the historic sites of Mandurah and Pinjarra and connect up with the Etmilyn Forest Train Excursion at Dwellingup. Day-tour operators also visit Ravenswood, the Murray and Serpentine River Deltas and link up with a River Cruise Operation on the Peel Harvey Estuary.

Many opportunities exist to extend these tours to include Yalgorup National Park. An opportunity also exists to provide nature-based tours that could feature the waterbirds which are prevalent in the internationally important wetlands. The day and half-day tours of the Mandurah canals and the Dawesville Channel could easily be extended to include the Park’s flora and fauna and scenic areas.

A regional tourism complex providing accommodation is not likely to be accepted within Lake Clifton's catchment boundary as the impact of increasing population density may be disruptive to the lake ecosystem. Any large scale regional tourism complex within the Park but outside the Lake Clifton catchment is also unlikely to be accepted because of concerns regarding weed and disease introduction and difficulty in managing human

A tourism complex that is adjacent to the Park and outside the catchment boundary is more likely to gain acceptance. The development proponent would however need to ensure that any adverse impact on Park values would be minimal and could be managed. This may require that funds for impact assessment studies and funds for ongoing management be provided by the developer. CALM would encourage development in the region that is environmentally and socially sensitive and that is of educative or interpretive value to visitors.

Actions

1. **Liaise with tour operators to inform them of regional and local management initiatives, developments and road conditions.**

2. **Ensure that commercial tour operators maintain appropriate standards with respect to information, quality of service provided and minimal environmental impact operations.**

3. **Ensure tour operators obtain the appropriate level of permission to operate within the Park and pay the necessary fees for their activities.**

4. **Identify the sustainable level of tourist operator use where concessionaires wish to operate, monitor the impacts of these activities and regulate them as required.**

5. **Call for expressions of interest for concessionaires and limit the number of operators to a sustainable level.**

6. **Encourage tourism within the region particularly that which is of educational or interpretive value to visitors.**

7. **Advise on locations for proposed tourist complexes giving preference to those outside the Park, its catchment and those that are environmentally and socially sensitive.**

33. LEASES

The objective is to ensure that lease arrangements and activities within the Park are compatible with other Park values and management objectives.

Currently two types of leases affect the Park: apiary sites and waterskiing. Leases within the Park include six apiary sites (Map 6). Conflict has occurred between these two operations due to the limited number of fresh water points. The safety of operational staff and

Feral colonies have become established in the Park. These should be located and removed. Beekeepers should also be kept informed of annual burning programs and notified before each prescribed bum.

The Bunbury Waterskiing Club, which operates on Harvey Shire land, is another lease holder which carries out its activities in the Park (Map 2). The impact that water skiing has on the Park's conservation values will need to be assessed. Conservation values that may be affected include the use of the lake by large numbers of Shelduck and Musk Duck. The impact of waterskiing on Lake Preston on Shelduck moult migration needs to be assessed.

The use of the lake by the Waterskiing Club tends to be intensive during summer, particularly over long weekends and school holidays. More than 60 people have been counted on the foreshore reserve, and a large number of these camped within the local government reserve. The adequacy of existing facilities to handle these numbers needs to be determined. Nutrient enrichment of Lake Preston may be resulting from the existing toilet facility. An assessment of the impact of the lease activity will need to take this into consideration.

Actions

1. **Investigate the possibility of relocating some apiary sites.**

2. **Ensure that the present location of apiary sites or naturally established bee hives cause no inconvenience or danger to Park staff or visitors and are appropriately located within the natural environment of the Park.**

3. **Require occupiers of registered sites to comply with notice of hive ownership, as required by the Beekeepers' Act.**

4. **Implement a system of permanent signposting showing apiary site numbers at each site.**

5. **Assess the environmental impact on Lake Preston of waterskiing and the foreshore facilities provided, and report the results to the NPNCA.**

PART G. INTERACTION WITH NEARBY LANDS AND WATERS

34. PRIVATE PROPERTY

The objective is to encourage management of nearby private property to be in sympathy with management of the Park.

Private property owners within the groundwater divide of Lake Clifton and Lake Preston shall be encouraged to manage their properties so as not to increase nutrient input into the Lakes. Preliminary evidence suggests that Lake Clifton may have reached its nutrient assimilative capacity and further uncontrolled development may reduce water quality. This could destroy living stromatolites and thrombolites in Lake Clifton. Overland water flow could be the main contributor to nutrient loading in the lake at present. Fringing vegetation along the foreshore and along drains will help to ameliorate this.

Land-use activities in the Lake Clifton and Lake Preston Catchments, that cause the fringing vegetation between private property and the lake to deteriorate, could result in an increase in nutrient loading. It is important to maintain the conservation values of the Lakes by protecting the lake foreshore buffer areas by fencing to exclude stock, managing weed intrusions and minimising disturbance including fire. In addition, protection of the lake foreshore fringing vegetation by fencing and rehabilitation of existing remnant vegetation with indigenous species should be actively encouraged through some type of incentive program and liaison with land care groups.

Any proposals for irrigated agriculture, intensive agriculture or groundwater extraction within the Lake Clifton and Lake Preston Catchments, particularly on the eastern shoreline of Lake Clifton, which are likely to effect lake water quality or quantity may be subject to an assessment by Department of Planning and Urban Development, Department of Environmental Protection, Water Authority of WA and WA Department of Agriculture. Proposals to subdivide through local government, particularly along the eastern shoreline of Lake Clifton, are unlikely to be supported unless the proponent is able to show that the subdivision will not result in an increase in nutrient input into Lake Clifton.

Increased residential or tourist density, through rezoning or allowing chalets or caravan parks

on rural land, is unlikely to be supported by CALM because of the increased pressures on the environment and requirements for septic tank sewage disposal. Because of the potential contamination of the groundwater, conventional septic tank leach drain systems may not be considered adequate, and any proposals for new on-site effluent disposal systems may also be subject to an assessment within the Lake Clifton and Lake Preston catchments.

Actions

1 **Encourage private property owners to manage their properties to reduce nutrient input into the lakes.**

2. **Encourage private property owners to protect fringing vegetation between private property and the lakes by excluding stock, weeds, fire and any use of the area that may degrade the soil or vegetation.**

3. **Encourage private property owners to rehabilitate areas of fringing vegetation with indigenous species, provide plants and trees when possible and inform property owners of preferred species to plant.**

4 **Seek to inform present and prospective landowners of compatible land use practices and environmental constraints on land-use in the Lake Clifton and Lake Preston catchments.**

5. **Actively encourage private land owners to fence their properties and control stock, the spread of disease, weeds, feral animals and fire particularly in areas near any of the lakes.**

6. **Inform Park neighbours about Park management practices and encourage them to manage their lands in sympathy with Park objectives.**

35. LOCAL GOVERNMENT

The objectives are to:

- **Negotiate with local government to introduce land management practices that complement Park management.**
- **Negotiate for local government planning to be consistent with Park management objectives.**

Yalgorup National Park is within three local government authority boundaries: the Shire of Harvey, the Shire of Waroona and the City of Mandurah. Each authority has foreshore reserves or road reserves, including fringing vegetation along either Lake Clifton or Lake Preston. In order to manage these consistently, the foreshore reserves and the lake fringing vegetation component of road reserves should be vested in the National Parks and Nature Conservation Authority. Other reserves in local government control with very high

conservation and recreation value, which are adjacent to the Park, should be considered for addition to the Park (See Section 4).

It will be desirable for local government reserves and road reserves adjacent to or nearby the Park to be managed in a complementary way

each of the reserves or Toad reserves are important, where conservation values within the reserve are at risk, where fire management needs to be considered to protect people and property in adjoining areas or where activities within the area have a potential to adversely affect the Yalgorup National Park.

The planning process at the local government level can act to inform present and prospective landowners of allowable land uses and environmental constraints in Town Planning Schemes. One way to protect areas of fringing vegetation may be to designate a landscape protection area around Lake Clifton and Lake Preston. No clearing or filling of landscape protection areas would be allowed without permission from local government. Land covenants could be imposed on land titles at the time of subdivision, to protect Park values. Rural Studies , District Planning Strategies and Coastal Management Plans are also important inputs into Town Planning Schemes.

The Authority responsible for implementing the Town Planning Scheme is the Local Government Council. Any proposal to develop or change land that is likely to have an affect on Park values, should be referred to CALM for advice and recommendations. The onus of proof that the proposal will not result in an increase of nutrients into Lake Clifton or Lake Preston, or will not adversely affect Lake Clifton or Lake Preston, will rest with the developer.

Local councils should consider groundwater flows, proximity to either lake, objectives of management plans in the area, the Yalgorup National Park Management Plan and particularly the potential impact of any proposal, on water quality or quantity within the lakes. Proposals that do not appear to be consistent with achieving the Park plan's objectives should be referred to CALM for advice.

Actions

1. **Negotiate with local government authorities to manage land near the Park in a way that is consistent with Park management objectives.**

2. **Encourage local government to prepare management plans where property and conservation values of the Park, or in adjacent reserves may be at risk.**

3. **Liaise with local government planning staff and councilors to ensure that any proposal on private land is adequately assessed for potential impacts on Park values.**

4. **Negotiate with local government to CALM if it may potentially affect Park values.**

5. **Assist local Shires and others, where possible, to conserve natural areas particularly areas adjacent to the Park**

Land held or vested by State Government Departments near the Park includes the vacant Crown land (coastal strip adjacent to the Park) held by the Department of Land Administration, the Marram Grass Reserve 25912 vested in the Department of Agriculture, State Forest vested in the Lands and Forest Commission and Reserve 39349 vested in the Water Authority of Western Australia.

Any land owner in the South West Coastal Groundwater Area, wishing to sink a bore, is required to get approval from the Water Authority of Western Australia and its advisory committee. The Environmental Protection Authority can also be called in to assess groundwater applications and make recommendations. In April 1991 the EPA assessed four applications for well licenses within the Lake Clifton catchment. Three of these were considered to be environmentally unacceptable. The one application considered environmentally acceptable was a well license for domestic consumption, while the three opposed were part of irrigated land proposals that could contribute to nutrient enrichment 01 Lake Clifton.

The Environmental Protection Authority has now set a precedent with these decisions, and further proposals will be easier to deal with if an Environmental Protection Policy (EPP) is in place. Instead of recommending against environmentally unacceptable land uses on a Policy would inform landowners in advance of acceptable land us

The Department of Planning and Urban Development (DPUD) gives final approval to subdivisions and rezoning proposals, and has recently had to put a number of conditions on a T
proposal within the Lake Clifton catchment. A legal agreement was also involved. DPUD was involved in extensive liaison with other State Government departments in setting these conditions. DPUD would have a much easier task in the future if an EPP and a

complementary statement of planning policy by DPUD was put in place, which could guide local government Council decisions and town planning scheme revisions.

Regional plans being prepared by DPUD, which affect the Yalgorup National Park, include the Peel Regional Plan and the Draft Wellington Bunbury Regional Plan. These plans can address environmental strategies that use catchment boundaries to determine locations for preferred land uses and can detail environmental constraints on land use within these catchment boundaries. Area plans such as the Preston Beach Coastal Plan, which affect the National Park, can be produced by DPUD. Other management plans which DPLJD helps to commission and supervise, such as the Coastal Management Plan for the City of Mandurah, will also affect the National Park. DPUD can direct policy and control development and is also responsible for processing town planning schemes.

The Department of Agriculture advises on any special residential, rural residential or intensive agriculture development proposals. Local

interdepartmental group. Other State Government agencies that provide advice to landholders on land-use practices in the vicinity of the Park catchment include the Waterways Commission, Water Authority, Peel Inlet Management Authority and the Department of Minerals and Energy.

All persons proposing to clear over I hectare must obtain permission from the Commissioner of Soil Conservation. Private property can also be protected under the Soil and Land Conservation Act to preserve vegetation threatened by land degradation.

The Main Roads Department has recently widened the Old Coast Road, a second carriageway is planned and a new major road may dissect a portion of the proposed addition to the Park. Land requirements for proposed major road widening including second carriageway developments and new major road developments consider all engineering, economic, environmental and social factors and involve public and government agency consultation. It would be CALM's preference that any proposed addition to National Park not be dissected by a major road development. However, it is not expected that the proposed addition boundaries will be formalised until after the outcome of a Public Environmental Review on the new major road development proposal. Limestone mining is also required to provide road building materials. This occurs in various locations outside the Park. CALM State Forest proposed to be added to the Park, includes some areas with potential high grade limestone and areas that require fuel reduction burning to protect adjacent pine plantations. The old Whittakers Mill Site, within this proposed addition, is a recreation day-use area. Access to the existing rest stops and other presently permitted activities in forested areas east of the Old Coast Road are likely to continue as they have been, through the life of this management plan. The remainder of this area is proposed to be zoned 'natural environment'. A closer evaluation of conservation values, resource management requirements and major road development proposals will need to he done to determine the most appropriate area suitable for addition to the Park. The areas with the highest conservation values may include Tuart/Peppermint

vegetation with good fauna habitat potential and/or areas with priority flora or important vegetation groups. Some of the State Forest to the south is also considered important for migration of fauna between the Park and a system of swamps to the east (EPA, 1983).

A gazetted water ski area was approved in the southern section of Lake Preston in 1967 (3). The Bunbury Water Ski Club has a lease on Harvey Shire land and the club has located facilities near the lake. Waterskiing occurring within the National Park on Lake Preston need to be reviewed to determine whether the activity can continue or whether the operation needs to be modified to reduce any environmental impact. The Fisheries Department and the Department of Transport are the agencies with which CALM will also need to liaise to protect the fisheries resource and monitor coastal erosion by wave action. The Department of Health is responsible for mosquito and midge control and with the Environmental

Actions

1. **Arrange for all land owners who seek approval from local government to construct a bore in the Clifton/Preston catchment to be advised that they are required to consult with the Water Authority and the South West Coastal Groundwater Advisory Committee.**

2. **Encourage the Department of Environmental Protection to prepare an Environmental Protection Policy which provides for the protection of Lake Clifton and Lake Preston and in particular the associated vegetation and water quality.**

3. **Encourage the Department of Planning and Urban Development to:**

   i) complement the Environmental Protection Policy with a statement of planning.

   ii) ensure consistency between their Peel Region Plan, the Bunbury Wellington Region Plan and CALM's planning and policy documents regarding directions to local government on development control.

4. **Support the Department of Agriculture and the Community Catchment Support Group (Peel Harvey Community Catchment Centre in Pinjarra) in advising, educating and involving the Clifton/Preston catchment community to manage their properties to minimise nutrient loading and pollution in the catchment.**

5. **Encourage other State Government Departments to plan for operations and management consistent with CALM's planning and policy documents in the area.**

6. **Use a coordinated approach between the relevant authorities, departments and landowners to ensure land uses or sub-divisions of enclaves or adjoining private land do not adversely affect Park values.**

7. **Liaise with relevant authorities and departments to ensure that land-use on adjoining land does not adversely affect Park values.**

8. **Review the boundaries of the areas of State Forest proposed for addition to the Park and ensure that conservation values and resource management requirements are adequately accounted for.**

PART H. RESEARCH AND MONITORING

37. RESEARCH STRATEGY

Research efforts should be integrated so that a clearer picture about the ecology of the area can be built up, using a number of contributions to achieve a greater depth of knowledge. As part of wider management programs the knowledge base becomes broader, and further integration and information exchange occurs in a more holistic manner.

Studies required include monitoring groundwater quality, quantity and overland flow, weeds, feral animals, plant diseases, native flora and fauna species surveys, and studies to assess the impact of fire on weeds and Tuart regeneration, and the effect of horse riding and water-based recreation on conservation values of the Park. A greater understanding of benthic microbial communities and water chemistry requirements, and a greater understanding of the processes determining Lake Clifton's nutrient status are important for government agencies to decide what protection measures are required for the survival and growth of the stromatolite, thrombolites and benthic microbial communities.

Studies that are outside the Park, but within the Park catchment area, include groundwater studies by CSIRO and the Water Authority, and should also include studies of the impact of land-use activities in the catchment and studies to determine filter strip characteristics important in protecting conservation values of the lakes. CALM is involved with research in the Lake Clifton area to enable knowledge-based decisions to be made to protect the stromatolites and thrombolites. Volunteers and educational institutions should be encouraged to participate in research programs, particularly those that have priority in terms of conservation values at risk.

The social research strategy is to increase the data base that currently includes Rangers' observations from 1988, recent surveys of neighbours and visitor surveys, a Martins Tank camping registration survey, and traffic counter data. The Park is "young" in that it is not well known and has a very high proportion of first-time visitors. Preferences and perceptions will be important to assess in the early stages, and promotion of the Park should be strategically planned to keep ahead of recreational pressures. Park promotion, social research and information, interpretation and education programs need to be run hand in hand. The most important step will be to involve the neighbours of the Park, particularly those along the eastern foreshore of Lake Clifton.

The pressures exerted by recreational activities will need to be assessed regularly. The need for additional facilities will need to be monitored taking into consideration population growth in nearby areas, zoning and access. A sustainable level of use by tourist operators will need to be determined. Volunteer activities, such as camp ground hosts and

38. NATURE CONSERVATION RESEARCH

The objectives are to:
• Increase knowledge of the Park's flora and fauna.
• Increase knowledge and understanding of the Park's natural processes.

The Park's flora and fauna require a great deal more survey and research. The fauna distribution and abundance is important, particularly with regard to the Grey Kangaroo which may or may not be having an impact on dune stabilisation. Feral animals, particularly the rabbit and the fox, are recognised as having an impact on conservation values, and monitoring in association with control should be escalated in cooperation with the Agriculture Protection Board and property owners. Further surveys are needed to establish whether the Ring-tail Possum, Honey Possum, Pigmy Possum, Bandicoot, Wambenger and Quokka are present. If any of these are present, management will need to ensure that their habitat is conserved and will need to consider specific requirements for each species particularly in relation to predation, fire regimes and plant disease occurrence.

A detailed flora survey has been completed for the coast of the City of Mandurah, which includes much of the northern section of the Park. This survey should be extended to cover all of Yalgorup National Park. The vegetation groups could then be considered on a smaller scale when planning for new facility and track locations. Fortunately most new recreational developments are to be located in the area that has recently been surveyed. The numbers of threatened or priority species known to be present within the Park are likely to increase with more intense surveys through the remainder of the Park.

The benthic microbial communities, their association with water chemistry and, in particular, the associations responsible for the survival and growth of stromatolites and thrombolites in Lake Clifton need further research. An integrated catchment management approach will be important in researching patterns and processes within the Park's catchment area. The impacts of catchment land-use and management practices on ground and surface waters need to be researched so as to allow predictions on how the Park's conservation values may be affected. CALM, CSIRO and a number of other government departments and educational institutions will be working together to improve knowledge and understanding of the natural processes important for sustaining ecological systems.

Universities have undertaken a great deal of research in the Park and are well positioned with their expertise to continue to contribute. The University of Western Australia and the early observations of Neville Stanley himself have lead to a number of post graduate research projects and publications drawing world attention to the important conservation values of the Yalgorup lake system.

the Waterways Commission. Volunteers from the vicinity and students may also be suitable for monitoring the impact that may be occurring from any particular activity in the Park.

Plant diseases in the Park need further research, particularly Armillaria which seems to have the greatest impact in the Quindalup Dune System. Rehabilitation strategies for dune stabilisation, rehabilitation after mining and Tuart regeneration and rehabilitation all need to continue to evolve with concerted effort, and can be good community involvement projects. Fire management research depends on preliminary assessments of flora and fauna to determine the suitable locations for experimental burning prescriptions.

The area between the Martins Tank chain of lakes and Lake Clifton has been intensively researched by CSIRO. Coring and subsequent groundwater monitoring has yielded a great deal of important information on stratigraphy, history and groundwater hydrology. This area has also been selected as a possible release site for the Ring-tailed Possum. Any site selected for the release of fauna would also require a fox control program. Burning of this area should be subject to a survey of the flora and fauna before and after the burn. The hydrological impact of burning could also be assessed. Fire in relation to weeds and Tuart regeneration will need further research efforts to fine tune burning prescriptions.

Water-based recreation possibilities in the future may include Martins Tank Lake where canoeing will be investigated. In the southern section of Lake Preston waterskiing and canoeing have been permitted since 1967. The use of this area needs to be assessed to determine if there is a significant impact on conservation values such as would warrant either disallowing the activity, or modifying the time and location of the activity. Horse riding will be allowed subject to continuous assessment by CALM. The Department may disallow or modify management if the activity is found to impact adversely on the Park's values.

Actions

I Implement an integrated program of nature conservation research, survey and monitoring within the Park and in surrounding areas, and investigate reporting on this program annually to the community.

2. Encourage research by CALM staff and others into aspects of the Park relevant to its management. Modify management practices on the basis of improved knowledge.

3. Carry out more detailed surveys to record the distribution, abundance and other details of flora and fauna.

4. Carry out detailed surveys of the Park's flora and vegetation to complement work recently done in the northern section.

7. Actively encourage research into the hydrology of the Park and its surrounds, and monitor the impacts of catchment land-use practices on ground and surface waters to enable better scientifically- based land-use management decisions.

8. Monitor the effectiveness and impacts of fire management measures and make any necessary changes to procedures in the light of research and experience.

9. Monitor the status of all plant diseases in the Park and carry out any necessary management actions in the event that new disease threats become apparent.

10. Review management prescriptions in the light *of* any new research into the introduction, spread, impact or control of plant disease in the Park.

11. Review rehabilitation efforts, the population dynamics *of* Tuart and other key species and develop new rehabilitation techniques and species recruitment methods where necessary.

12. Investigate the habitat requirements and ecology of vulnerable species in relation to the impact of feral predators, fire regimes and plant disease occurrence.

13. Assess the Park's flora and fauna to determine appropriate release sites for the Ring-tailed Possum and any other native fauna. Implement a fox control program in association with landholders, and integrate and coordinate research efforts in the area.

14. Assess the effects of water-based recreation and disallow or modify management of the activity if environmental impacts are unacceptable.

15. Monitor the impacts of horse riding and disallow or modify management of the activity if environmental impacts are found to be unacceptable.

16. Encourage volunteers, educational institutions and other organisations to participate in nature conservation research projects.

39. SOCIAL RESEARCH

The objectives are to:

- Monitor visitor use including experience and perceptions and forecast future recreational demands.
- Monitor the impact of visitor use, land use and management

observations, from January 1988 to April 1990, has been placed on a data base. This type of information shows trends and helps forecast future recreational demands.

Neighbour and visitor surveys have also recently been conducted in the Park. These surveys indicate visitors' perceptions and levels of satisfaction of the Park, as well as the types of activities occurring.

In the user survey, the majority of visitors were visiting the Park for the first time. It will be important to assess the perceptions of visitors in these early stages and to use this information to determine the best strategy to promote the Park. This information can also be used to assess the need for additional facilities. In the user survey most visitors were with a partner or family group and were from the metropolitan area. The feature that users liked the least about the Park was the lack of facilities, and the aspect they liked most was the natural environment, the quiet and its feeling of isolation. Suggested improvements for the Park included providing more facilities and more information on the Park and its flora and fauna.

In the neighbour survey, two activities that neighbours liked least were the recreational use of motorbikes and four wheel drive vehicles. Activities that the neighbours liked most were observing the natural environment, wildlife and birds. Many of the neighbours wished the Park to be left as it is and a number requested the development of a horse riding trail in the Park. Continued liaison and involvement with Park neighbours will be very important to assess levels of satisfaction and to help monitor impacts.

While initial data have already been collected on the uses and use levels in the Park, research needs to be continued to monitor trends and ensure that adequate provision of facilities precedes increased use of the Park. This will in turn minimise degradation.

The social research strategy will include installing a traffic counter on North Preston Beach Road to ascertain vehicle numbers. Visitors using Martins Tank Camp Ground are requested to sign a registration book and this also helps to ascertain visitor numbers and the need for additional facilities.

Existing and future tourist operations will need to be assessed in terms of likely impact. Conscientious regulation and monitoring of tourist operations and visitor numbers will help to

determine a sustainable level for tourist operator use. Any increase in facilities or recreational opportunities will need to consider increases in population and access, particularly coming from the north where the greatest population increases will occur.

Social research and monitoring projects should determine if recreation, environmental education and interpretation activities are meeting visitor needs. The impacts of all activities should be monitored, and changes made if any impacts are unacceptable. It is appropriate that research and monitoring involves as wide a range of people as possible. The involvement of volunteers

patterns, preferences and perceptions, and to assess levels of satisfaction with Park management.

2. **Monitor the need for additional facilities resulting from changes in visitor use, and consider their provision subject to an assessment of their likely impact.**

3. **Encourage volunteers, educational institutions and other organisations to participate in social research projects.**

PART I PLAN IMPLEMENTATION

40. PRIORITIES

The objective is to manage the Park according to assigned priorities for implementation.

The conservation value in the Park that is most under threat is Lake Clifton and its stromatolites and thrombolites. Actions to protect conservation values of Lake Clifton are the highest priority to carry out and are listed in Group 1. 'nose which would immediately protect the Park's other conservation values are also high priority and are listed in Group 2. Group 3 includes high priority management, research or information dissemination actions that need to proceed along with actions that more directly protect and restore conservation values. Often the development of increased recreational opportunities and associated facilities can direct, control and minimise impact from recreational activities, particularly when educational and interpretive programs are part of the opportunity offered. Recreational actions are also included in the third group for this reason.

TABLE 8. MANAGEMENT PRIORITIES
(by Section and Action)

HIGH PRIORITY - GROUP 1

4. Land Tenure and Boundaries

4. Negotiate with the relevant State or local government authorities about adding to the Park the following reserves: 40372, 33285, 28796, 32261, 33843, 34745, 27458 and 25912 (Table 2).

7. Geology, Landforms and Soils

2. Mnimise development along the edge of the lakes and disturbance to the vegetation and foreshores of the Vasse Lagoonal System (See Map 4).

8. Vegetation and Flora

4. Protect and restore the Vasse Lagoonal Complex and the Quindalup Dune Complex and the fringing vegetation around the Lakes.

10. The Lake System

1. Liaise with local government to ensure that management of lakeside reserves is consistent with Park management objectives
2. Survey poorly identified tenure boundaries.
3. Reposition or establish new fences on foreshores to stop stock entering the lakes or consider an incentive program for private property owners so they will take this initiative.

HIGH PRIORITY – GROUP 1 (cont)

5. Liaise with local government, relevant State Government agencies, CSIRO and the DEP to provide advice to landholders on land-use practices that are appropriate within the Park catchment area (see State Government section).
6. Restrict recreational activities on the takes to waterskiing and canoeing in the lower section of Lake Preston.
8. Seek greater legislative protection of the Lake Clifton stromatolites and thrombolites.

24. Nature Observation and Nature Trails

6. Provide a nature observation facility at the end of Mount John Road for viewing waterbirds and stromatolites and thrombolites in Lake Clifton.

1. Encourage private property owners to manage their properties to reduce nutrient input into the lakes.
2. Encourage private property owners to protect fringing vegetation between private property and the lakes by excluding stock, weeds, fire and any use of the area that may degrade the soil or vegetation.
3. Encourage private property owners to rehabilitate areas of fringing vegetation with indigenous species, provide plants and trees when possible and inform property owners of preferred species to plant.
5. Actively encourage private land owners to fence their properties and control stock, the spread of disease, weeds, feral animals and fire particularly in any areas near the lakes.

HIGH PRIORITY - GROUP 2

4. Land Tenure and Boundaries

5. Acquire for the Park or seek sympathetic management, from current vesting bodies, of Melros Reserve 33139 and Tims Thicket Reserve 24198.

7. Geology, Landforms and Soils

4. Minimise management activities in, and public access to, the coastal dunes areas.

8. Vegetation and Flora

1. Locate threatened and priority flora species and store information on biology, location, and herbarium specimens at the District Office, the State Herbarium and at CALMs Como Office. Consult records and take appropriate action before undertaking development or management activities.
2. Extend the detailed vegetation and flora survey undertaken in the Park's northern section to cover the entire Park and important adjacent areas. Locate populations of important vegetation groups and priority and fire sensitive species, and develop management recommendations for their conservation particularly preceding any new recreational site development or burning operation.
3. Protect areas that are in good condition and protect and consider enhancing areas with threatened and priority flora, particularly those vegetation communities and species susceptible to disturbance, plant disease or weed invasion.

9. Fauna

1. Protect fauna habitats from the spread of weeds, disease, wildfires, and human disturbance.
4. Instigate more intensive fauna surveys and investigate reintroducing former known threatened fauna inhabitants in conjunction with a fox baiting program (See Section 17 Feral Animals).

13. Visual Landscape

3. Classify Park landscapes according to the Departmental Landscape Management System.
4. Any visual alterations to the natural landscape should be subtle, and remain subordinate to natural elements by borrowing extensively from form, line, colour, texture and scale found commonly in the surrounding landscape.

14. Erosion, Mining and Rehabilitation

2. Monitor the movement of dune blowouts. If a blowout is expanding and is likely to destroy management infrastructure or important vegetation or habitats, implement control measures,
8. Ensure that within any scenic areas, degraded landscapes (such as quarries) are rehabilitated after use or progressively in stages.

15. Disease

1. Conduct plant disease surveys and implement appropriate hygiene measures prior to commencing any operation that requires soil or plant material movement.
2. Educate Park users about plant disease, through printed information emphasising preference for summer activity use in the Park and the need to stay on well formed roads or tracks.
3. Provide educational signs and printed information for horse riders on disease management strategies.
4. Train Park staff to recognise plant diseases, and in sampling and management techniques.

16. Introduced Plants and Noxious Weeds

1. Liaise with the Agriculture Protection Board, landholders and local authorities regarding weed control on Park boundaries and adjacent properties.
2. Continue to maintain a register of all known occurrences and severity of introduced weeds.
3. Prepare and implement an introduced plants and weeds control program.
4. Monitor any effects of control programs on non-target species and make changes to procedures if required.

4. Implement comprehensive feral animal control programs in conjunction with native fauna release programs.

18. Fire

1. Implement prescribed bums in accordance with the master burning plan. Implement a range of fire regimes, including variation in season, intensity and size, particularly between different blocks according to the fire management plan (Map 6).
2. Burning will be conducted in accordance with written prescriptions approved by CALM's District Manager (available for viewing on request). The frequency of prescribed burns will depend on the succession of litter accumulation and protection, regeneration and conservation requirements.
3. Strategically placed fuel reduced areas will be maintained, rather than narrow buffers, along private property boundaries. Where possible successive bums in each block will be programmed in different seasons,
4. Roads required for fire control and essential management activities will be defined and maintained to suitable standards. Firebreak construction will be kept to a minimum. Those roads considered unsuitable for public use will remain closed to the public (See Section 22).
5. Continue to liaise with local government and the local Bush Fire Brigades to ensure an effective fire fighting force is in place. Establish agreements with adjacent landholder agencies, where necessary, regarding a cooperative approach to carry out fuel reduction requirements. If conditions or land responsibilities change, review agreements or establish now agreements to ensure ongoing protection.

HIGH PRIORITY - GROUP 2 (Cont)

6. Contain all fires in or threatening the Park considering values at risk, disease risk, fire behaviour, resources presence of low fuel areas and ecological values. Suppression actions may include direct attack, backburning from established roads or buffers, or by allowing the fire to bum out to low fuel buffers.
7. Actively promote public education and awareness of fire risk, safety and survival through pamphlets information boards and personal contact by Park staff.

19. Tuart

1. Initiate research to study the effects of land-use and fire management on the population dynamics of Tuart to determine whether or not Peppermint is replacing Tuart in some stands.
2. Select recruitment methods that do not adversely effect other Park conservation values such as habitat requirements for the Ring-tailed Possum.
3. Seek NPNCA approval of recruitment methods before they proceed, if research shows that intervention is necessary.

21. Attractions and Existing Use

3. Monitor the impacts of all activities in the Park and make any necessary changes to management practices if unacceptable impacts are found to be occurring.

22. Access

1. Confine public vehicle access to existing developed roads and tracks where possible.
6. Monitor, in association with user groups and local government, all four wheel drive tracks, access to four wheel drive beaches, the use of dune buggies and motorbikes and instigate management action as necessary.
8. Maintain management tracks to a level suitable for visitor convenience and management requirements.
12. Restrict vehicles to using any vegetated beach areas between the low and high water marks and discourage access into vegetated foredunes; with signs and road closures.

25. Day Use

4. Tims Thicket Road (High Priority)

- Designate a day-use area south of Tims Thicket Road if the site is added to the Park.
- Provide further day-use facilities south of Tims Thicket Road in a suitable location near the beach with a walk track to the beach if the site is added to the Park.
- Rehabilitate all unnecessary vehicle tracks and disturbed areas.
- Investigate the possibility of using old quarries for recreation after further rehabilitation, including earth shaping and revegetation.

26. Camping

10. Tims Thicket Road (High Priority)

14. Assess the effects of water-based recreation and disallow or modify management of the activity if environmental impacts are unacceptable.

HIGH PRIORITY - GROUP 3

5. Zoning

1. Introduce a zoning scheme to manage the Park (Map 3).
4. Inform the public of the zoning system, including where access is allowed, and the reasons for the zones.

7. Geology, Landforms and Soils

3. Locate and design recreation sites to prevent or minimise their impact on fragile geological features an landforms.
5. Locate access roads and recreation sites according to specialist advice on prevailing wind direction stabilisation of slopes, disease-risk, and land capability.

10. **The Lake System**

4. Inform landholders of the importance of minimizing nutrient input into the lakes.

13. **Visual Landscape**

1 . Manage all Park landscapes according to CALM's Landscape Management Policy Statement No. 34 and seek specialist advice when implementing the management plan.
2. Plan and implement all activities in the Park to complement rather than detract from the inherent vis qualifies of the Park and surrounding landscapes.
9. Encourage local authorities, other government agencies and private landholders to use landscape management skills when siting facilities and signs, selecting site-compatible materials and colours, and planning for utilities, roads and building envelopes.

14. **Erosion, Mining and Rehabilitation**

1 . Ensure that, as far as possible, any mining or excavation operations within or adjacent to the Park has minimum impact on the Park, particularly with regard to landscape values, spread of disease and decrease in water quality.
3. Prepare a detailed rehabilitation program that prioritises the works to be implemented and includes dun stabilization techniques.
6. Ensure native plant species that occur in the Park are used in rehabilitation for brushing, planting and seeding.
7. Train Park staff in all aspects of disease identification and rehabilitation work. Seek specialist advice a required-

15. **Disease**

5. Determine how susceptible the Park's plant species are to disease, starting with all threatened and priority species.

17. **Feral Animals**

1 . Continue to liaise with the Agriculture Protection Board, local government authorities and surrounding Ian holders to control feral animals and to educate landholders of the impact of feral animals including foxes cats and dogs on native wildlife,
2. Expand the Rabbit control program to include areas under rehabilitation and ensure chemicals used do no affect native fauna.
3. Monitor feral animal populations and regularly assess the effectiveness of control programs and their threat to native flora and fauna.

22. Access

2. Ensure access is in place to evacuate the Park in an emergency.
3. Close and rehabilitate all unnecessary access tracks.
4. Provide two wheel drive access within walking distance of the beach by continuing North Preston Beach Road closer to the beach, and investigate the possibility of allowing four wheel drive access to the beach (Map 8 Prop. new access).

13. Provide information to Park users on appropriate for wheel drive techniques for coastal areas.

HIGH PRIORITY - GROUP 3 (Cont)

effects
of horse activity on water quality.
Close tracks when maintenance work or rehabilitation is required.
Monitor the impacts of horse riding and modify or further restrict use if the activity appears environmentally unacceptable.

25. Day Use

3. Martins Tank (High Priority)

· Develop a day-use area at Martins Tank Lake for picnicking with a walk to Lake Pollard and further north

5. White Hill Road (High Priority)

· Develop a day-use area at the end of White Hill Road with a lookout, picnic facilities, two wheel drive access close to the beach and four wheel drive beach access.

8. Information Bay (High Priority)

· Maintain information facilities at this site on Preston Beach Road, and consider including a toilet when the walk track to Lake Preston and the lookout has been developed.

9. Mount John Road (High Priority)

· Design a day-use site at the end of Mount John Road with the main activity being to interpret the stromatolites and thrombolites in Lake Clifton.

26. Camping

8. Design camping sites and facilities to ensure that potential risks to visitors and the impact on Park values are minimised.

9. Martins Tank (High Priority)

· Continue site development at Martins Tank Camp Ground in accordance with the Recreation Development Plan.

27. Water Based Activities

1. Retain the waterskiing zone, access by the Bunbury Waterski Club and access by the public boat launching facility on Lake Preston subject to monitoring environmental impacts.
3. Provide information on the conservation values of Lake Clifton, Hayward and Pollard to explain to visitors why water-based activities are not permitted on these lakes.
4. Monitor the effects of water-based recreation activities on the environment and modify the activities is necessary.
6. Consider introducing some form of conditional canoeing in Martins Tank Lake, and extending zoning for. canoeing to include the entire lower third of Lake Preston, after an assessment has been made to determine the environmental impact canoeing will have on each of these lakes.

29. Information and Interpretation

1. Develop and implement a community education and interpretation strategy for the Park.
3. Build small information/interpretation facilities at Mount John Road, Lake Hayward, Martins Tank, White Hill Road and at the Lime Kilns as funds become available.

30. Education

4. Liaise with program coordinators to modify any educational activities that may be having a detrimental impact on the Park's environment.

HIGH PRIORITY - GROUP 3 (Cont)

32. Tourism

2. Ensure that commercial tour operators maintain appropriate standards with respect to information, quality 0 service provided and minimal environmental impact operations.
4. Identify the sustainable level of tourist operator use where concessionaires wish to operate, monitor the impacts of these activities and regulate them as required.
5. Call for expressions of interest for concessionaires and limit the number of operators to a sustainable level.

34. **Private Property**

4. Seek to inform present and prospective landowners of compatible land-use practices and environmental constraints on land-use in the Lake Clifton and Lake Preston catchments.
6. Inform Park neighbours about Park management practices and encourage them to manage their lands in sympathy with Park objectives.

36. State Government

1. Arrange for all land owners who seek approval from local government to construct a bore in the Clifton/Preston catchment to be advised that that they are required to consult with the Water Authority an the South West Coastal Groundwater Advisory Committee,
2. Encourage the Department of Environmental Protection to prepare an Environmental Protection Policy which provides for the protection of Lake Clifton and Lake Preston and in particular the associated vegetation and water quality.
3. Encourage the Department of Planning and Urban Development to:
   i) complement the Environmental Protection Policy with a statement of planning.
   ii) ensure consistency between their Peel Region Plan, the Bunbury Wellington Region Plan and CALM' planning and policy documents regarding directions to local government on development control,
4. Support the Department of Agriculture and the Community Catchment Support Group (Peel Harvey Community Catchment Centre in Pinjarra) in advising, educating and involving the Clifton/Presto] catchment community to manage their properties to minimise nutrient loading and pollution in the catchment.
6. Use a coordinated approach between the relevant authorities departments and landowners to ensure land use or sub-divisions of enclaves or adjoining private land do not adversely affect Park values.
7. Liaise with relevant authorities and departments to ensure that land use on adjoining land does not adversely affect Park values.

38. Nature Conservation Research

6. Continue research to increase knowledge and understanding of patterns and processes in the Park's ecosystem and, particularly, within Lake Clifton and the Park catchment.
7. Actively encourage research into the, hydrology of the Park and its surrounds, and monitor the impacts of catchment land-use practices on ground and surface waters to enable better scientifically-based land-use management decisions.
8. Monitor the effectiveness and impacts of fire management measures and make any necessary changes to procedures in the light of research and experience.
9. Monitor the status of all plant diseases in the Park and carry out any necessary management actions in the event that new disease threats become apparent.
12. Investigate the habitat requirements and ecology of vulnerable species in relation to the impact of feral predators, fire regimes and plant disease occurrence.
13. Assess the Park's flora and fauna to determine appropriate release sites for the Ring-tailed Possum and any other native fauna. Implement a fox control program in association with landholders, and integrate and coordinate research efforts in the area.

HIGH PRIORITY - GROUP 3 (Cont)

15. Monitor the impacts of horse riding and disallow or modify management of the activity if environmental impacts are found to be unacceptable.

39. Social Research

2. Monitor the need for additional facilities resulting from changes in visitor use, and consider their provision subject to an assessment of their likely impact.

40. Priorities

3. Seek resources to implement this plan, as detailed in Staff and Funding (Section 41).

41. Staff and Funding

1. Seek sufficient staff or staffing arrangements at Yalgorup National Park to enable recreational site developments to proceed, particularly in the northern section of the Park.
2. Actively seek sufficient funds to implement this plan and to enable administrative and maintenance infrastructure to expand to cover the Park and additions to it.
3. Install a self registration camping fee collection station at Martins Tank. Use the funds collected to increase, improve and maintain Park facilities and services.
4. Seek revenue from external sources such as special grants, sponsorship and other alternative funding, which could be managed by a trust fund established to implement the Plan.
5. continue to seek budget allocations for Yalgorup National Park sufficient to ensure the recommendations in this Plan are implemented.

3. Control access to separate incompatible activities and provide for equitable use.

Geology, Landforms and Soils

1. Identify specific areas of the Park that are vulnerable to damage due to the nature of the geology, soils and landforms.
6. Provide interpretive information on the Park's geology, its relationship with landforms, soils and vegetation and their vulnerability to damage.

8. Vegetation and Flora

5. Minimise or prevent the removal of or damage to vegetation from constructing and maintaining roads and tracks, and developing and maintaining facilities for visitor use.
7. Retain representative areas of each vegetation community in locations that have been unburnt for extended periods of time (Section 18).

9. Fauna

2. Ensure mosquito and midge research and control programs are approved by CALM s Director of Nature Conservation by virtue of the power delegated to him by the NPNCA (NPNCA, 1993).
3. Increase knowledge of the Park's fauna by recording the incidences of death or injury to fauna resulting from motor vehicles and other causes.

MEDIUM PRIORITY (Cont)

11. Aboriginal History

1. Identify Noongar people having cultural links and ongoing interests in the Park.
2. Consult with Noongar people on matters of cultural interest in Park management or interpretation or field study activities in the Park (NPNCA, 199 1).
3. Report Aboriginal artefacts or other findings to the Department of Aboriginal Sites, Western Australia Museum and ensure artefacts or findings are protected.
4. Encourage archaeological and ethnographic surveys of the Yalgorup National Park.
5. Ensure that CALM's obligations under relevant legislation are fulfilled if any development activities are proposed in the Park.
6. Commence discussions with local aboriginals and other appropriate bodies to address access and use of an area, within or near the Park, for Aboriginal cultural purposes.

12. European History

1. Collate existing information on historic sites located in the Park and maintain an up-to-date register o sites. Liaise closely with local government, the Peel Development Commission, National Trust of WA the Heritage Council of WA and the Australian Heritage Commission to prepare and maintain registers an to evaluate potential additions.
2. Develop management guidelines for any historic sites in accordance with the Burra Charter, and in liaison with the WA Museum, National Trust of WA, Australian Heritage Commission, tertiary institutions an historical societies.
3. Establish a program to conserve historic places, demarcate sites, develop facilities and disseminate visitor information.
4. Encourage historical research and an archeological survey to be carried out at the lime kilns.
5. Liaise with local historical societies regarding volunteer work and other activities.

13. Visual Landscape

5. The District Manager to vet site development plans before any development, maintenance or rehabilitation works are implemented, to ensure conformity with landscape management principles.
6. Use interpretive and explanatory signs before and during operations that affect visual landscape qualifies.
7. Focus views onto distinctive features by selective siting and aligning of roads and walking tracks.
8. Give high priority to rehabilitating previously disturbed sites, such as old quarries in the northern section o the Park, to attain the desired standard of scenic quality.

14. Erosion, Mining and Rehabilitation

4. Investigate more effective rehabilitation strategies and actively involve private and public groups and individuals in rehabilitation programs.
5. Monitor, evaluate and record progress of rehabilitation techniques used.

5. Prepare detailed plans and specifications for all proposed tracks and parking areas in accordance with accepted design principles and Departmental standards. These include:

- Design and develop any new access routes as low in the topography as possible and in a manner that complements Park landscapes while maximising scenic opportunities (Section 13).
- Locate and design access routes in the Park so that they do not degrade surface and groundwater quality.
- Conduct a full disease assessment of all areas in which track reconstruction will occur.
- Develop and maintain access routes in ways that minimise the risk of spreading disease.

7. Progressively develop a varied system of walking tracks within the Park, distinct from tracks for vehicles or horses.

MEDIUM PRIORITY (Cont)

9. Provide access close to a safe area of beach that is vehicle free.
11. Direct vehicles to the most appropriate areas, close unsuitable roads and tracks and prescribe conditions o use that will minimise environmental and social impacts.
14. Identify existing access roads and tracks suitable for bicycle riding.

23. Horse Riding

5. Link the horse riding trail with the existing 10th Light Horse Bridle Trail.
8. Encourage horse riding in areas outside the Park and its Lakes, such as pine plantations, which are able to sustain this activity.
9. Encourage horse riders to feed their horses on a seed free diet for 24 hours prior to entering the Park.
10. Require Park riders to display a license tag on their horse to show they have paid a registration fee. Use the fees to maintain horse riding trails.
11. Seek financial support from horse riding groups and neighbouring horse property owners to help establish and maintain the horse riding trail.

24. Nature Observation and Nature Trails

1 . Provide a variety of walks and nature walks throughout the Park (Map 8).
2. Provide adequate information from which visitors can choose the walk best suited to their needs.
3. Designate preferred backpack camping areas along the path network where appropriate and consider fresh water availability and well maintenance if practical (Map 7).
4. Provide safe access to points of special natural interest where this can be achieved without threat to the natural environment or visual landscape.
5. Locate a lookout at the end of White Hill Road and include relevant interpretive material.
7. Design and develop a short nature walk from the Mount John Road day-use area.
8. Investigate the possibility of constructing waterbird viewing facilities at Lake Preston, Lake Hayward and Lake Pollard.
9. Provide a walk loop to Lake Preston from the Lake Preston day-use area.
10. Provide a walk from the Preston Beach Road Information Bay to a lookout and to Lake Preston.
11. Develop a nature walk at the end of North Preston Beach Road which includes a lookout.
12. Develop a long walk from Martins Tank Lake north to location 5524 and around Lake Clifton to Mount John Road. Within this walk develop shorter loops around Lake Pollard and two varying length loops that each include a lookout in location 5524.

25. Day Use

1. Design and develop day-use sites and environmentally sensitive facilities in accordance with the Department's Policy Statement No. 18 Recreation, Tourism and Visitor services and the Central Forest Region Regional Plan Day Use Strategies.
2. Ensure that site development plans are completed and approved by the District Manager before development, maintenance or rehabilitation works are undertaken.
7. Lake Preston (Medium Priority)

   Redesign the day-use area to provide for picnicking, walking and birdwatching on Lake Preston.

   Continue to rehabilitate the quarry at the Lake Preston day-use area.

   In the redesign, investigate the potential to expand if and when the need is demonstrated.
10. Lime Kilns (Medium Priority)

    Provide vehicle access, puking, picnic facilities, interpretive information and toilets at the

13, Northwest of Martins Tank (Medium Priority)
Develop a day-use facility that focuses on a nature walk. Provide information, interpretation and limited picnic facilities.

MEDIUM PRIORITY (Cont)

26. Camping

1. Design and develop camping sites and facilities in accordance with the Departments Policy Statement No. 18 Recreation, Tourism and Visitor Services and the Central Forest Regional Plan Camping Strategies.
2. Ensure that site development plans are completed and approved by the District Manager before development, maintenance or rehabilitation works are implemented.
3. Continue to collect camping fees in the Park to help offset the cost of providing and maintaining facilities.
4. Investigate the use of a self-registering system.
5. Maintain liaison with individuals and organizations who provide campgrounds on nearby or adjacent lands.
6. Permit backpack camping in designated sites along the walk track in location 5524.
7. Cater for a range of camping requirements, such as small and large groups, within the Park and investigate group camping arrangements that include vehicles in the group camp.

28 Pets

1. Provide information to Park visitors explaining the Department's policy on pets, and enforce the policy.
2. Encourage the use of areas outside the Park, that are able to sustain activities such as pet exercising.
3. Allow dogs, on a leash, at the Whittakers Mill recreation area, which is proposed for addition to the National Park. If adjacent Park beaches at Tims Thicket, White Hill and Preston Reach are included in the Park, zoning for pets will be considered in consultation with the public. Pets will not be allowed in all other areas of the Park.

29. Information and Interpretation

2. Liaise with scientific study groups to develop an information base for use in education and interpretive programs.
5. Conduct seminars and information days for the public and landholders.

30. Education

1. Assist and encourage educational groups wherever appropriate.
2. Investigate the possibility of assisting the University of Western Australia to continue operating the Neville Stanley Field Station.
3. Liaise with educational groups using the Park to review the education programs and set standards for appropriate research.
5. Consider the impact of any proposed Park management activities on educational programs.

31. Community Involvement

1. Maintain and foster close communication and the active involvement of local individuals and groups interested in Yalgorup National Park.
6. Consider establishing an Advisory Committee or Strategy Group to facilitate ongoing community involvement.

32. Tourism

1. Liaise with tour operators to inform them of regional and local management initiatives, developments and road conditions.
3. Ensure tour operators obtain the appropriate level of permission to operate within the Park and pay the necessary fees for their activities.
6. Encourage tourism within the region particularly that which is of educational or interpretive value to visitors.
7. Advise on locations for proposed tourist complexes giving preference to those outside the Park, it catchment and those that are environmentally and socially sensitive.

33. Leases

I. Investigate the possibility of relocating some apiary sites.

5. Encourage other State Government Departments to plan for operations and management consistent with CALM's planning and policy documents in the area.
8. Review the boundaries of the areas of State Forest proposed for addition to the Park to ensure that conservation values and resource management requirements are adequately accounted for.

38. Nature Conservation Research

1. Implement an integrated program of natural conservation research, survey and monitoring within the Park and in surrounding areas, and investigate reporting on this program annually to the community.
2. Encourage research by CALM staff and others into aspects of the Park relevant to its management. Modify management practices on the basis of improved knowledge.
5. Assess the efficiency of management control of weeds and feral animals and any effects these controls have on non-target species. Make changes to procedures if required.
10. Review management prescriptions in the light of any new research into the introduction, spread, impact or control of plant disease in the Park.
11. Review rehabilitation efforts, the population dynamics of Tuart and other key species and develop new rehabilitation techniques and species recruitment methods where necessary.
16. Encourage volunteers, educational institutions and other organisations to participate in nature conservation research projects.

39. Social Research

I . Implement an integrated program of social research, survey and monitoring within the Park to determine visitor numbers, patterns, preferences and perceptions, and to assess levels of satisfaction with Park management.
3. Encourage volunteers, educational institutions and other organisations to participate in social research projects.

40. **Priorities**

1. Assign priorities to the management recommendations detailed in this Plan and implement them in order o priority, subject to availability of resources.
2. Review priorities periodically and make any necessary changes.

42. Evaluation and Review

1 . Review the implementation of the Plan periodically to assess its progress and revise the priority status o recommendations.
2. Review recommendations in the light of new information, particularly from research and monitoring programs. If a major change in the direction of the Plan is required, any proposed revision is subject to NPNCA approval and if approved will be released for public comment (There is a prevision for this under Section 61 of the CALM Act, 1984).

LOW PRIORITY

4. Land Tenure and Boundaries

3. Acquire, by purchase or exchange when opportunities arise and funds are available, private property enclave and properties adjoining the Park that have exceptional conservation or recreation values, management benefits, or that could protect areas with these values within the Park.
6. Encourage the Waroona Shire Council to include protection of the environment in the purpose of Reserve 22091.
7. Investigate the conservation values of the Bouvard Reefs and coastal waters adjacent to Yalgorup National Park and if appropriate recommend their inclusion in a Marine Park or a Nature Reserve.

8. Vegetation and Flora

6. Provide visitors with opportunities to view and increase their knowledge of the Park's vegetation. Including appropriate walk tracks and provide interpretive material.

LOW PRIORITY (Cont)

10. The Lake System

7. Provide researchers with permits to use boats on any of the lakes for approved study purposes only.

21. **Attractions Existing** Use

1. Liaise with Park visitors to identify their specific needs and determine if and how opportunities and facilities to meet these needs can be provided.

26. **Camping**

11. White Hill Road (Low Priority)

If Tims Thicket is not included in the Park.

Designate a camping area at the end of White Hill Road that caters for a range of camping requirements.

27.Water Based Activities

5. Permit "overnight resting" in vehicles along the beach adjacent to the National Park for people beach fishing. "Overnight resting" is defined as sleeping in, or next to a vehicle for no more than one night This recommendation will be subject to the coastal strip adjacent to the National Park being added to the Park and will be subject to periodic review once in place.

29. **Information and Interpretation**

6. Provide information on opportunities for various types of day-use recreation activities both in the Park and on other lands in the area.
7. Provide information on points of scenic interest in the Park and provide interpretation at these points for visitors.

31. Community Involvement

2. Monitor community response to Departmental policies and management practices through both formal and informal contacts.
3. Identify recommendations within this Management Plan that can be implemented by community involvement.
4. Seek assistance from volunteers in education programs and to monitor and control weed species in the Park.
5. Encourage volunteer programs to help with rehabilitation work.

Implementing some of the recommendations in this plan is ongoing, and unless more concerned effort is required, they may not have been included in the three high priority categories. This does not mean that they are not important but that others require more immediate attention as new initiatives that are not necessarily being covered adequately. A medium priority recommendation is often, therefore, one which is being implemented on an ongoing basis.

Priorities should be periodically reviewed and any necessary changes made as recommendations are implemented, are no longer relevant, are no longer appropriate, or circumstances change which affect the availability of resource. Resources to implement this plan can come from a number of different sources, and may be available to implement

particular recommendations which may not necessarily be the highest priority recommendations. Every effort should be made to seek resources to implement this plan's recommendations, but particular effort should be made to seek financial and human resources to implement high priority recommendations.

Actions

1 Assign priorities to the management recommendations detailed in this Plan and implement them in order of priority, subject to availability of resources.

2. Review priorities periodically and make any necessary changes.

Yalgorup National Park extends between Mandurah and Australind and is over 40 kilometres long. The National Park Ranger resides in the centre of the Park. In the northern section of the Park new facilities and recreational activities are being proposed. The northern section is also under the greatest pressure from Mandurah's expanding population and associated recreational demands. Vandalism to signs and illegal entry into the Park is a problem in the north.

The need for a resident Ranger in the White Hill Road area was recognised, and land was acquired for this purpose a number of years ago. A second ranger or some increase in CALM staff presence in the north is a pre-requisite for implementing several important recommendations outlined in this Plan. As an interim measure a mobile ranger could be stationed in a caravan on the White Hill Road block or housed locally during peak periods. Participants at the Community Workshop expressed a desire for an additional ranger to be located in the northern section of the Park.

CALM staff from the District Office and specialist CALM staff such as research biologists, fire specialists and recreation planners frequently attend to issues to do with management or research. A greater input will be expected by all of these once the management plan is released. It will be the responsibility of the District to increase CALM's involvement in the research, planning and management of the Park to implement the Plan's high priority recommendations.

Funding will also need to be increased to implement recommendations that involve establishing new facilities. An initial increase in the budget allocation to Yalgorup will also be required to implement priority management recommendations.

Research monitoring assistance, supervision of the construction of new facilities, and greater presence for the larger number of recreators expected in the northern section of the Park, will all require more of the Ranger's time. In order to free the Ranger from collecting fees at Martins Tank a self registration camping fee collection system should be established. Fees collected will help pay for new facilities.

Alternative funding could come from special grants or sponsorship. A trust fund could be used to handle these financial arrangements.

Actions

Seek sufficient staff or staffing arrangements at Yalgorup National Park to enable recreational site developments to proceed, particularly in the northern section of the Park.

2. **Actively seek sufficient funds to implement this Plan and to enable administrative and maintenance infrastructure to expand to cover the Park and additions to it.**

3. **Install a self registration camping fee collection station at Martins Tank. Use the funds collected to increase, improve and**

5. **Continue to seek budget allocations for Yalgorup National Park sufficient to ensure the recommendations in this Plan are implemented.**

42. EVALUATION AND REVIEW

The Yalgorup National Park Advisory Committee was established to assist in preparing the draft management plan and the final plan. In the light of new information, particularly to do with either the viability of the stromatolites and thrombolites in Lake Clifton or the impact of any recreational activities on Park values, the Plan may need to be revised. Implementation of the Plan should be reviewed periodically, priorities revised and the recommendations contained in this Plan assessed when they are completed. When the final Plan is complete it will direct management of the Park for a 10 year period. At the end of the 10 year period the Plan will be revised.

Actions

1 **Review the implementation of the Plan periodically to assess its progress and revise the priority status of recommendations.**

2. **Review recommendations in the light of new information, particularly from research and monitoring programs. If a major change in the direction of the Plan is required, any proposed revision is subject to NPNCA approval and if approved will be released for public comment. (There is provision for this under Section 61 of the CALM Act, 1984.)**

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GLOSSARY OF TERMS

Algal mat: uniform growth of algae on a surface, resembling a grass lawn.

Benthic microbial communities: an assemblage of bottom dwelling organisms characterised mainly by very small algae and bacteria.

Benthos: bottom dwelling organisms.

Bioturbation: The movement of bottom sediment of a lake due to disturbance by aquatic organisms.

Burra Charter: Australian heritage legislation that resulted from a convention in Burra (South Australia). It contains the principles of heritage conservation which have been developed by heritage professionals throughout Australia. It has been revised a number of times over the last 10 years, with the most recent version being published in April 1988.

Blowout: a mobile sand dune devoid of stabilizing vegetation, often being activated by the wind and often encroaching on surrounding inland areas.

Cohesive mucilaginous mat: an algal mat which is stuck together forming a solid mass.

Confined aquifer: underground water which lies between two relatively impervious layers.

Cyanobacteria: small photosynthetic cells that are bacteria.

Declared rare flora: plant species that are uncommon, not widely distributed, occurring sparsely across their range or that are presumed extinct, endangered or vulnerable over a longer period through continued depletion.

Epiphyte: plant growing on another plant.

Frames of reference: the criteria by which to judge the physical features of a visual landscape as high, moderate or low scenic quality.

Landscape character type: a broad scale area of land with common visual characteristics based on a amalgamation of landform, climate, vegetation,

Glossary

Priority species:	those plant species which may be rare or threatened but for which there is insufficient survey data available to accurately determine their true status. Priority species also include rare species which are currently not threatened.
Quaternary period:	the most recent period of geological time, from the present to about 1.8 million years ago.
Ramsar:	Convention on Wetlands of International Importance; Especially as Waterfowl Habitat. Signatories to the United Nations Educational Scientific and Cultural Organisation's Convention have agreed to designate suitable wetlands within their territories for inclusion in a List of Wetlands of International Importance, to ensure the conservation of wetlands and their flora and fauna by combining national policies with coordinated international action (UNESCO 1971).
Rare:	plants, animals or other organisms which are not widely distributed, or which occur only sparsely across the range.
Stromatolite:	microbialite with a layered internal framework.
Tertiary period:	period of geological time, from about 1.8 million to 65 million years ago.
Threatened:	of species or other taxa, which are naturally rare or geographically restricted, or have become so as a result of human activities and are in danger of declining further, or becoming extinct, unless adverse factors acting upon them can be identified and ameliorated.
Thrombolites:	microbialite with a clotted (unlayered) internal framework.