Rockingham Lakes Regional Park

Management Plan
2010

Management Plan No. 67

Conservation Commission of Western Australia

Department of Environment and Conservation

City of Rockingham

Rockingham Lakes Regional Park

Management Plan

2010

PLANNING TEAM

The Planning Team, representing the managers of Rockingham Lakes Regional Park, coordinated the development of this plan on behalf of the Conservation Commission of Western Australia. The Planning Team was assisted by a consultancy team led by Environmental Resources Management Australia Pty Ltd.

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How to Use This Plan

This Plan is divided into chapters and sections as set out in the table of contents. Guiding principles are stated at the beginning of each chapter. An objective is given at the beginning of each section, followed by a discussion of the main issues and then strategies, which list responsible agencies and a priority rating. Priority ratings provide an indication of the relative importance of a strategy. Key Performance Indicators are listed in the Plan and outline performance measures, targets and reporting requirements.

A number of issues raised in this Plan are interrelated and are dealt with under more than one section. Where this is the case, the discussion refers the reader to other related sections.

ACKNOWLEDGEMENTS

Numerous individuals and groups have contributed valuable ideas and information in the preparation of this draft management plan and their efforts are gratefully acknowledged. In particular, the contribution of the Rockingham Lakes Regional Park Community Advisory Committee is appreciated. The assistance of the Environmental Resources Management Australia Pty Ltd consultancy team is also appreciated.

NOMENCLATURE

Inclusion of a name in this publication does not imply its approval by the relevant nomenclature authority.

THE CONSERVATION COMMISSION OF WESTERN AUSTRALIA AND THE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

All national parks, conservation parks, nature reserves, and other similar reserves are vested in the Conservation Commission of Western Australia (Conservation Commission). These reserves are managed on behalf of the Conservation Commission by the Department of Environment and Conservation.

As the controlling body, the Conservation Commission is responsible for having management plans prepared for all lands that are vested in it. This plan has been prepared by the Department of Environment and Conservation on behalf of the Conservation Commission.

Preface

Regional parks consist of areas of land that have been identified as having outstanding conservation, landscape and recreation values. Regional parks may consist of land areas managed by a range of different management agencies, and private landowners. Regional parks therefore provide the opportunity for a consortium of land managers and landowners to work together to develop a coordinated management approach.

Set in a rapidly growing urban area, Rockingham Lakes Regional Park is a network of environmentally significant lands containing coastal, wetland and upland ecosystems. The park occupies a significant proportion of the City of Rockingham, and is not only important for conservation in this urban context, but also for the range of recreational opportunities it provides.

The park crosses the unique Rockingham-Becher Plain, from the coastal promontories of Cape Peron and Port Kennedy, to the wetlands of Lakes Cooloongup and Walyungup. This area is significant for its geomorphic landforms because the distinct parallel sand ridges indicate the positions of former shorelines, providing a record of sea level changes over the past 7,000 years. Wetlands have formed in between the sand ridges, and these are also significant because they form part of an evolutionary time sequence and support unique vegetation communities. The Becher Point Wetlands are listed as wetlands of international significance under the Ramsar Convention. Thus the area is of considerable interest and importance for research on coastal history, the evolution of wetlands and biological succession.

The park also contains significant flora and fauna, including two 'threatened ecological communities': sedgelands in Holocene dune swales and thrombolites at Lake Richmond. In addition, the woodlands and wetlands around Lake Cooloongup, Lake Walyungup, Tamworth Hill, Tamworth Hill Swamp, Anstey and Paganoni Swamps are important remnants of ecosystems that were once widespread on the Swan Coastal Plain.

While the park has undoubtedly high nature conservation values and contains some popular recreation areas, it is at the same time beset by a number of critical management problems, such as vegetation degradation and loss, widespread weed invasion and feral animal impacts. This management plan, which is based on previously prepared ecological, recreational and historical surveys, as well as information collected during the study period, seeks to establish clear objectives on how best to manage and protect Rockingham Lakes Regional Park.

The Rockingham Lakes Regional Park Community Advisory Committee was established early in the planning process to provide input during the preparation of the plan. The plan has been developed through consultation with a range of stakeholder groups and it reflects their contributions. The draft plan was released for public comment on 27 October 2003 until 27 February 2004. This final plan reflects the outcomes of the investigative and consultative periods and provides a way forward for the sustainable and cooperative management of the Rockingham Lakes Regional Park.

It is recognised that a considerable period of time has elapsed since the draft management plan was released for public comment in 2003. The delay in preparing the final management plan in no way diminishes the value of the contributions made by any organisation or individual. These contributions are important, and remain critical to the integrity of the management plan and ultimately, to the management of the park.

Some issues that were identified in the draft management plan in 2003 may no longer be current or may have changed. New issues have arisen. In finalising the management plan, DEC has attempted to capture the changes that have occurred since 2003 with individual stakeholders and managing agencies without compromising the integrity of the original process of developing the draft plan.

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A. INTRODUCTION

1. Purpose and Status of the Management Plan

PURPOSE OF THE PLAN

The purpose of this management plan ('the Plan') is to provide the overarching approach for the protection and enhancement of the conservation, recreation and landscape values of Rockingham Lakes Regional Park ('the Park'). The Plan includes strategies aimed at conserving the special features of the Park and providing for future community requirements. The Plan will also help to sustainably manage significant nature conservation and cultural values while allowing for an appropriate level of use by the community.

Given the strategic nature of the Plan, more detailed planning (referred to as subsidiary plans) is required prior to significant works taking place within the Park (these are listed in Section 46).

STATUS OF THE PLAN

The Plan has been prepared in accordance with the *Conservation and Land Management Act 1984* (CALM Act). It provides the statutory framework for the management of lands within the Park vested in the Conservation Commission and managed by DEC on the Commission's behalf. The Plan also guides DEC in coordinating the involvement of other managing agencies.

The Conservation Commission and DEC will seek to ensure that planning undertaken by other management agencies for areas within the Park is consistent with the overall direction and principles of this Plan.

In consultation with DEC, the Western Australian Planning Commission (WAPC) will use the Plan to assist with the assessment of development proposals on lands within and adjoining Rockingham Lakes Regional Park to ensure that proposed land use is compatible, and to limit impacts upon the nature conservation and social values of the Park.

The strategies contained in the Plan have been endorsed by Rockingham City Council. The City of Rockingham will refer to the Plan to manage the areas of the Park vested in it, in consultation with DEC.

2. Regional Parks

WHAT IS A REGIONAL PARK?

Regional parks are areas identified as having regionally significant conservation, landscape and recreation values. Regional parks are a land management system that provides the opportunity for a coordinated planning and management approach by a number of management agencies and private landowners.

Regional parks may comprise Crown lands vested in State government agencies and local governments, as well as private lands where the agreement of the landowner is obtained.

As such regional parks may comprise lands with a variety of tenures and reserve purposes, drawn together for integrated management which is coordinated by DEC. Rockingham Lakes Regional Park consists of land comprising Crown reserves vested in the City of Rockingham, the Conservation Commission and the Minister for Community Services, as well as freehold land owned by the WAPC and the Water Corporation, and privately-owned land.

Those lands that have been acquired by the WAPC for inclusion in the Park are to be transferred to the Conservation Commission or the City of Rockingham, for management as part of the regional park.

THE REGIONAL PARK CONCEPT

The concept of regional open space was first introduced to Western Australia in 1955 by the Stephenson-Hepburn Report, which recommended that a statutory region plan be prepared for Perth which reserved private land required for future public purposes. In I963, the Perth Metropolitan Region Scheme (MRS) was established and under the scheme, land was reserved for 'Parks and Recreation'. This land (subject to amendments of the MRS) has been gradually acquired by State planning authorities with the intention of protecting open space of regional significance for conservation and recreation.

Areas with regionally significant conservation, landscape and recreation value were identified by the Environmental Protection Authority (EPA) in *Conservation Reserves for Western Australia, The Darling System – System 6* (Department of Conservation and Environment, 1983). This report recommended areas of land be managed as regional parks. A system of regional parks was envisaged which included Rockingham Lakes, namely Lake Richmond; Lakes Cooloongup and Walyungup; Tamworth Hill Swamp; and Port Kennedy (Localities M102; M103; M104; M106 in the System 6 Report).

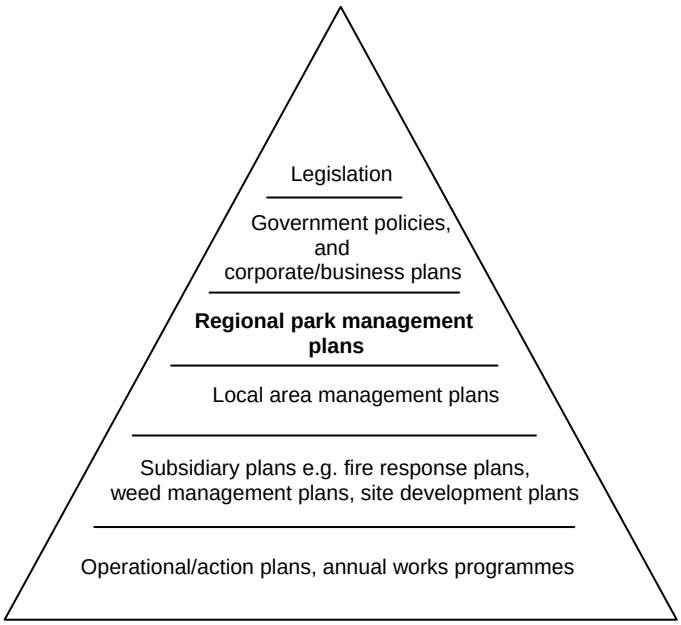
In 1989, the State government decided that the responsibility for managing regional parks would be established with the then Department of Conservation and Land Management, now DEC, and that the responsibility for planning and acquisition of lands for regional open space be retained by the then Department of Planning and Urban Development (now Department of Planning [DoP]) on behalf of the WAPC.

In 1990, a task-force report outlined proposed administration, planning and management of regional open space (Regional Parks Taskforce, 1990).

The EPA's *Red Book Status Report* (Environmental Protection Authority, 1993a) describes the transformation of regional parks from concept to reality as being difficult because of the range of land tenure involved and the funding requirements for continual management of the parks.

REGIONAL PARK PLANNING

Planning for regional parks occurs at a number of levels. Regional park management plans are a part of a broad suite of planning undertaken by the relevant managing agencies. Figure 1 illustrates the planning levels typically undertaken for regional parks.



Source: ANZECC 2000.

Figure 1 - Regional Park Planning Hierarchy

Implementation of local area management plans, subsidiary plans, operational/action plans and annual works programmes will be consistent with the overall direction of this Plan.

3. Rockingham Lakes Regional Park

Rockingham Lakes Regional Park is located approximately 39 kilometres south of the Perth central business district (see Figure 2).

The Park covers an area of 4,270 hectares, which consists of coastal areas, wetlands and remnant bushland areas. The main areas or estates of the Park (as indicated in Figure 3) are:

- Cape Peron;
- Lake Richmond;
- Lake Cooloongup;
- Lake Walyungup;
- Port Kennedy Scientific Park;
- Lark Hill;
- Tamworth Hill;
- Tamworth Hill Swamp;
- Anstey Swamp; and
- Paganoni Swamp.

General Overview

The Park is located in the City of Rockingham, which is experiencing rapid urban development. In 2006, the City had an approximate population of 88,900 people, and it is estimated that the population will be 130,100 in 2021 (Western Australian Planning Commission, 2005). Nearby urban development and increasing visitor numbers will place added pressure on the natural environment and recreation sites in the Park.

The Park is a significant feature of the Rockingham area, occupying around 16% of the area of the City of Rockingham. The Park is surrounded mainly by residential and commercial land uses, with some rural areas around Anstey and Paganoni Swamps, to the south-east of the Park.

The Park consists of a network of environmentally significant lands, comprising coastal, wetland and woodland ecosystems. There are areas of remnant vegetation in the Park that are considered in good condition. There are also highly disturbed areas of vegetation in the Park, which require rehabilitation.

Parts of the Park are used for recreation, with walking and nature observation being popular activities. The Park also provides access to the coast for swimming, snorkelling and boating. Land yachting and model aircraft flying occurs at Lake Walyungup, and the Rockingham Golf Course is located within the Park. Other parts of the Park have limited access and no recreational facilities, and receive few visitors.

Regional Context

Rockingham Lakes Regional Park is an important link in a series of reserves and regionally significant bushland in the region. Nearby, there are wetlands and bushland in Beeliar Regional Park, Leda Nature Reserve, Stakehill and Lakelands. The Shoalwater Islands Marine Park adjoins the Rockingham Lakes Regional Park to the west at Cape Peron, and extends from the Garden Island Causeway to Becher Point, including Shoalwater Bay and Warnbro Sound. The conservation, recreation and scientific values of the Park are enhanced by this regional context (Tingay and Associates, 1997).

Rural land uses occur to the east of Lake Walyungup, and provide a relatively undeveloped buffer to the wetland.

ESTABLISHMENT OF ROCKINGHAM LAKES REGIONAL PARK

In 1997, the WAPC, Port Kennedy Board of Management, DEC and the City of Rockingham collaborated to prepare the *Proposed Port Kennedy and Rockingham Parks Management Framework* (Tingay and Associates, 1997). The aim of the framework was to protect the environmental values of the Park, whilst allowing for a range of appropriate public uses. The resulting report collated information on the biological, environmental and geomorphic values of the Park, as well as the opportunities for recreation and ecotourism (Tingay and Associates, 1997). The Port Kennedy Scientific Park is now managed as part of the Rockingham Lakes Regional Park. The proposed boundary and management areas outlined in Tingay and Associates (1997) provide a basis for this Plan.

Public submissions were invited on the *Proposed Port Kennedy and Rockingham Parks Management Framework* (Tingay and Associates, 1997). These submissions have been reviewed during the preparation of this Plan, and the issues raised in the submissions have been addressed in this Plan where appropriate.

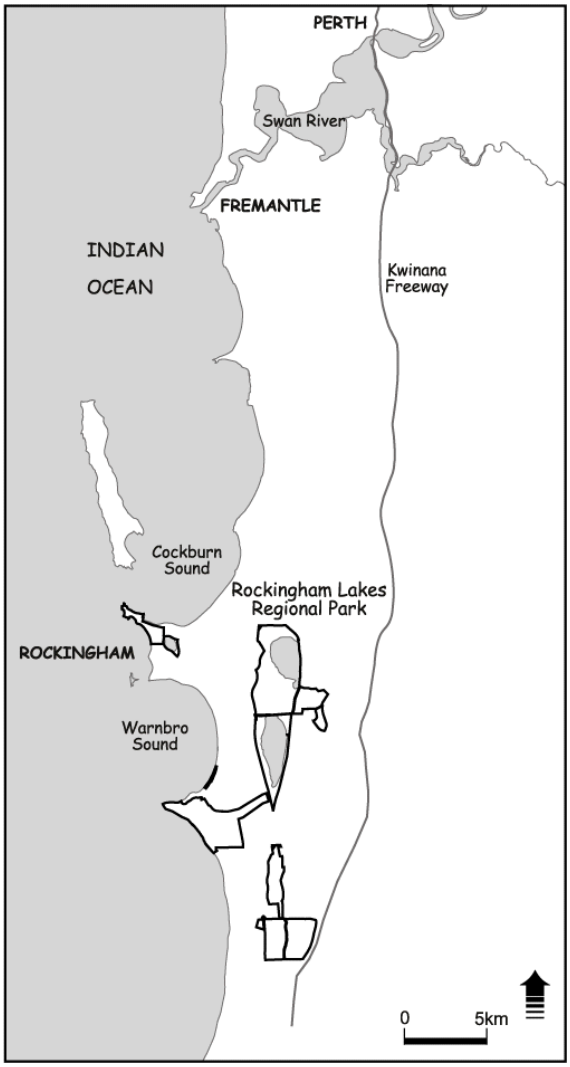


Figure 2 - Park Location

In 1997, the State government announced that Rockingham Lakes would be established as a regional park.

The Rockingham Lakes Community Advisory Committee was established by DEC in 1999 as a regular forum for public opinion and the exchange of advice on management issues affecting the Park.

PARK VALUES

The Park has a number of characteristics that are valued by the community. The foremost values of the Park are discussed below. The Plan seeks to protect and enhance these values.

Nature Conservation Value

Rockingham Lakes Regional Park has significant conservation value owing to its geomorphic features, the presence of diverse wetland types, habitat, flora and fauna. The Park's location in relation to other conservation reserves also enhances its value in a regional context. The Park is considered by the community to be an important natural remnant in its urban context.

The Park includes geomorphic features representative of an evolving coastal environment, which offer a unique opportunity for research into the history of sea level change and the process of coastal wetland development. The landforms and vegetation assemblages of the Rockingham-Becher Plain is unique in a global sense and is therefore of international importance (Semeniuk Research Group, 1991). The Park preserves an important remnant of this plain.

The vegetation communities in the Park represent a sequence from west to east; from coastal shrubland, permanent and ephemeral wetlands, to Quindalup woodlands including stands of tuart, jarrah and marri. This diversity of vegetation has high conservation value.

Of particular importance is the occurrence of two 'threatened ecological communities' (see Glossary): sedgelands in Holocene dune swales; and thrombolites in Lake Richmond. Both of these communities are listed as 'critically endangered' in Western Australia. The two threatened ecological communities are also listed as 'endangered' under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999 (*EPBC Act 1999*)*, and so receive additional recognition and protection.

The wetland ecosystems of the Park serve as a refuge for a diverse bird population, including trans-equatorial migratory birds that are protected under international agreements and the EPBC Act 1999. Carnaby's black cockatoo have been sighted in the Park and are also listed as threatened under the EPBC Act 1999. The Park is also highly valued as a refuge for other wildlife including quenda (*Isoodon obesulus fusciventer*) and western grey kangaroo (*Macropus fuliginosus*) (Tingay and Associates, 1996).

The Park contains natural sites and features recognised and in some instances, specially-protected at the national and international levels. The Australian Heritage Council recognises Tamworth Hill Swamp and Anstey Swamp as having heritage values that should be conserved. Lake Richmond, Port Kennedy Scientific Park, Paganoni Swamp and Adjacent Areas, and Lakes Cooloongup and Walyungup and Adjacent Areas are permanent entries on the Register of the National Estate.

The Becher Point Wetlands at Port Kennedy are listed as wetlands of international importance under the Ramsar Convention (see Glossary). These wetlands are also specially protected under the Commonwealth EPBC Act 1999 and listed on the Directory of Important Wetlands in Australia (Government of Western Australia, 2000).

Recreation Value

The diversity of recreation settings in the Park provides for a range of active and passive recreation pursuits. The Park is a resource for the Rockingham community, as well as the broader community. Urban growth and tourism development in the region will inevitably lead to greater visitor use of the Park.

Most visitors to the eastern areas of the Park are local residents, whereas Cape Peron has a greater profile and attracts visitors from across the Perth metropolitan area (Colmar Brunton, 2005).

The coastal areas of the Park - Cape Peron and Port Kennedy, provide access for recreational activities such as swimming, snorkelling and fishing. Wetland and bushland areas provide opportunities for walking and nature appreciation. Lake Walyungup is a unique setting within the metropolitan area for land yacht sailing and model aircraft flying. The Rockingham Golf Course is also located within the Park.

The Park provides opportunities to promote programmes like DEC's 'Healthy Parks, Healthy People', which encourages people to visit and enjoy themselves in parks by raising the awareness of the physical, mental and social health benefits of spending time in nature.

Proposed recreation facilities in the Park are described in Section 33 and illustrated in the Recreation Masterplan, Appendix A.

Cultural Heritage Value

The Rockingham area has significance to both Aboriginal and non-Aboriginal people.

Traditionally, Aboriginal family groups travelled this area throughout the seasons. The wetlands and woodlands of the Park are likely to have cultural significance for Aborigines due to their importance for food and water and their spiritual significance (Hayden and Hayden, 2002). Lake Richmond was an important area for gathering food and camping. Lakes Cooloongup and Walyungup also hold special Dreaming significance as places where the Sea Waugal laid her eggs (Walley, *pers. comm.*, 2002). Both of these names are Nyoongar in origin (Draper, 1997). Cooloongup means *place of children* and Walyungup means *place where Nyoongars talk* (Walley, pers. comm., 2002). Paganoni Swamp is also culturally significant as it has an Aboriginal burial site nearby. There are seven listed Aboriginal sites in the Park.

The first European exploration of the Rockingham area occurred between 1801 and 1804 by a French expedition under Commodore Nicolas Baudin (Fall, 1979). Baudin named a number of features along the coast, including Cape Peron. The name Rockingham however, commemorates a ship that ran aground in stormy conditions opposite the present location of Governor Road in 1830 (Fall, 1972).

Farmers settled the eastern parts of Rockingham during the 1830s, when many moved south to the area to find more arable soils than those near the failed settlement of Clarence, near to Woodman Point (Fall, 1972). Market gardening was previously undertaken on the east side of Lake Walyungup and dairy farming also occurred in the area. Rural pursuits are still undertaken to the east of Lakes Cooloongup and Walyungup.

The early fate of the town of Rockingham was tied to its port. The town grew as a result of the establishment of the port in Mangles Bay, which was important for the shipment of timber from local suppliers as well as those in the Jarrahdale area. Rockingham, however, declined to a small seaside settlement in the early twentieth century, once major ports were constructed at Bunbury and Fremantle (Fall, 1972).

During the Second World War, the HMAS Stirling Naval Base was established at Garden Island as a prominent centre of military and naval operations. The Cape Peron gun emplacements were established as an integral part of the coastal defence system, along with emplacements at Garden Island, Rottnest Island and Buckland Hill. The Cape Peron Battery Complex is listed on the Rockingham Municipal Heritage Inventory and is a permanent entry on the Register of the National Estate.

Improvement to transport and infrastructure systems lead to an increase of visitors and residents to the Rockingham area. Significant industrial growth occurred in the region in the early 1950s. Rockingham has since continued to experience growth in commercial, light industry and residential sectors. Despite the development that has occurred, numerous historic buildings and sites relating to early European settlement have been retained in Rockingham and in the Park (Government of Western Australia, 1979).

Landscape Value

The Park has many areas of high landscape quality, including mature woodlands and vegetated wetland areas. The tuart forests near Lake Cooloongup and the woodlands of Anstey and Paganoni Swamps provide natural landscapes in an urban area. Elevated views across the Rockingham-Becher Plain can be gained from Tamworth Hill. Water is a major visual element in the Park that adds to the landscape

amenity of the wetlands and coastal areas. The salt-encrusted expanses of Lakes Cooloongup and Walyungup create a stark but interesting landscape. The rugged Cape Peron promontory provides for vistas across Cockburn Sound to the north and Shoalwater Bay and islands to the south.

The diverse and distinctive landscape character types represented in the Park are integral to its scenic value.

Research and Education Value

The Park has some unique environmental features which also provide valuable research and education opportunities.

The proximity of Shoalwater Islands Marine Park and Rockingham Lakes Regional Park provides opportunities for researching and understanding coastal processes and ecosystems.

Remnant bushland areas and local wetlands hold significant conservation, scientific and aesthetic values. Research on the flora and fauna of these areas will provide further information to guide management decisions.

The Port Kennedy Scientific Park protects an important remnant of the Rockingham-Becher Plain, a geomorphic feature of international significance for scientific research. This area is one of the youngest formations on the Swan Coastal Plain and provides an example of Holocene sedimentation and stratigraphic evolution. The Rockingham-Becher Plain is globally unique as arguably the best example of a consistently-developed beach ridge complex in the world (Semeniuk Research Group, 1991). The Becher Point Wetlands, which occur in the swales of the ridges, are the only place in Australia that shows the progression of old to young wetlands, and they are recognised as a Ramsar Wetland of International Importance. These wetlands provide a record of the evolution of coastal wetlands and associated floral assemblages (Semeniuk Research Group, 1991). The wetlands also support 'critically endangered' sedgelands in Holocene dune swales. Research on these communities will assist in their protection and enhancement.

A 'critically endangered' community of thrombolites occurs at Lake Richmond. Thrombolites are microbial structures, which represent one of the oldest living organisms on earth. They have a scientific value, as well as a very high conservation value, because they may provide an insight into past environments. Lake Richmond is one of the few places in the world where thrombolites are found.

The Naragebup Rockingham Regional Environment Centre is located next to Lake Richmond. The centre is actively involved in environmental education, particularly with issues that affect the Park environment. Community members from the education centre are actively involved in helping to protect, conserve and enhance the Park's biodiversity.

4. The Management Planning Process and Community Involvement

This Plan has been prepared in five phases.

1. The first phase was aimed at identifying the Park's values and relevant planning and management issues. This was achieved by undertaking a literature review, analysing the existing condition of the Park and organising a community workshop. Public involvement in this phase was encouraged through newspaper articles and canvassing key stakeholders for the community workshop. Native Title claimants were notified of the Plan's preparation at the commencement of the process.

2. The second phase was the preparation of the draft Management Plan. This involved preparing planning strategies to protect values and address issues identified in the first phase. Within this phase, specialists within DEC, the City of Rockingham and the Rockingham Lakes Regional Park Community Advisory Committee provided advice on the development of the Plan.

3. The third phase involved presenting the draft Plan for public comment. The draft was open for public comment for a period of four months and its availability for review was widely advertised.

4. Phase four included the acknowledgement and analysis of public submissions.

5. The fifth phase comprised the preparation of this final Plan incorporating issues or comments raised within the public submissions and comments State government agencies and the City of Rockingham. The revised Plan has been endorsed by the Rockingham City Council and the Conservation Commission, and has been approved for release by the Minister for Environment.

B. PRINCIPAL MANAGEMENT DIRECTIONS

5. The Vision for the Park

The long-term vision for the Park is:

'The Rockingham Lakes Regional Park will be a well managed park supporting species and habitat diversity in a sustainable manner. The Park will provide for the conservation and preservation of ecological and cultural heritage values, research and education, as well as providing for the recreational needs of the community in a visually harmonious way.'

Strategy

1. **Manage the Park for nature conservation, and allow recreation and other uses to occur to the extent that they do not adversely impact on the other Park values. (DEC, CoR) [High]**

6. Legislation and Management Policies

The objective is for DEC to manage the Park in accordance with the CALM Act and to integrate the policies of the other managing agencies to support the vision for the Park.

LEGISLATION

This Plan has been prepared in accordance with the CALM Act. In managing the Park, DEC will utilise the provisions of the CALM Act and the *Wildlife Conservation Act 1950*, and associated regulations, as well as the provisions of any other legislation under which DEC may have responsibilities for implementation.

The CALM Act will be amended to specifically include the management of regional parks.

MANAGEMENT POLICIES

Department of Environment and Conservation
This Plan is consistent with DEC policies. These policies provide direction and guidance for the application of the CALM Act, the *Wildlife Conservation Act 1950* and associated regulations.

The policies specifically mentioned in this Plan are listed in Appendix B and are available to the public. A number of these policies were under review at the time of writing. Should there be any inconsistencies between this Plan and any revised policy, future management will be in accordance with the new policy.

City of Rockingham
The policies and management actions of the City of Rockingham in relation to the management of the Park will be consistent with this Plan.

Strategy

1. **Apply DEC policies in managing the Park. (DEC) [Ongoing]**

7. Park Boundary

The objective is to clearly define the Park boundary for the implementation of this Plan.

The Rockingham Lakes Regional Park boundary is based on the recommendations of the *Proposed Port Kennedy and Rockingham Lakes Management Framework* (Tingay and Associates, 1997). The boundary of the Park reflects the MRS, under which the majority of the Park is reserved as 'Parks and Recreation'.

Areas at Cape Peron, Lark Hill and Tamworth Hill that are reserved for 'Public Purposes' in the MRS, are controlled by the Water Corporation. While these areas are located within the boundary of the Park, they are not considered part of the Park for management purposes. The potential for the MRS to be amended so these areas are reserved for 'Parks and Recreation' has been the subject of discussions with the Water Corporation during the preparation of this Plan and discussions will continue.

A number of transport corridors traverse or adjoin the Park and these reservations are outside the Park.

Some small areas of the Park as proposed in the *Proposed Port Kennedy and Rockingham Lakes Management Framework* (Tingay and Associates, 1997) have been fragmented by transport infrastructure and isolated from the main estates of the Park. These areas are small and have difficult management boundaries. Their fragmentation and isolation have reduced their conservation value to the extent that they no longer constitute effective areas of the conservation estate. Four such areas have been removed from the Park in the north-west corners of Lake Cooloongup, Anstey Swamp, Paganoni Swamp and the southern point of Lake Walyungup. The southern boundary of Lake Richmond has also been amended to reflect the Parks and Recreation reservation in the MRS.

The Park boundary is shown in Figure 3.

Coastal boundary and interface with Shoalwater Islands Marine Park
The coastal boundary of Rockingham Lakes Regional Park at Cape Peron and Port Kennedy is as follows.

At Cape Peron, terrestrial Reserve 48968 extends to the low water mark. However, the Shoalwater Islands Marine Park extends landward to the high water mark (see Glossary), creating a slight overlap. To enable and clarify an effective and practical management regime, the operational boundary between the two is considered to be the high water mark. Both the Shoalwater Islands Marine Park and Reserve 48968 are managed by DEC. The Shoalwater Islands Marine Park is shown in Figure 3.

At Port Kennedy, terrestrial Reserves 44076 and 44077 (managed by the City of Rockingham and DEC respectively) extend to the high water mark. The City of Rockingham is responsible for managing the beach adjoining these reserves between the high water mark and low water mark. It is therefore important that there is close interaction between the City of Rockingham and DEC for the effective management of the Park.

Boundary of the Park at Lark Hill

The *Proposed Port Kennedy and Rockingham Lakes Management Framework* (Tingay and Associates, 1997) recommended an east-west corridor between Port Kennedy Scientific Park and the southern end of Lake Walyungup. The intent of the corridor was to maintain public access to open space of regional significance, as recommended in *Conservation Reserves for Western Australia, The Darling System - System 6* Report (Department of Conservation and Environment, 1983). The corridor also has a role in maintaining a relatively undeveloped link that traverses the geomorphic features from the coast to Lake Walyungup.

The corridor proposed in the *Proposed Port Kennedy and Rockingham Lakes Management Framework* (Tingay and Associates, 1997) includes areas reserved for 'Public Purposes' in the MRS which are owned by the Water Corporation. Should development be planned for Water Corporation land in this area, there may be an opportunity to design such development to minimise any impact on the corridor and maximise the value of the link. Discussion will continue between the Water Corporation, DoP, the City of Rockingham and DEC regarding the future land tenure arrangements and MRS reservations for this area.

The City of Rockingham, in conjunction with the WAPC, is developing the Lark Hill Regional Sporting and Equestrian Complex to the south of the corridor. The boundary of the complex in relation to the corridor is yet to be determined.

Inclusion of other lands into Rockingham Lakes Regional Park

The WAPC has jurisdiction for overall planning and acquisition of lands for regional parks. The inclusion of additional areas into the Park is therefore the responsibility of the WAPC, in consultation with DEC, the Conservation Commission and the City of Rockingham.

The WAPC is guided by *Bush Forever* in determining areas to be acquired for conservation purposes (Government of Western Australia, 2000). *Bush Forever* is a strategic plan that aims to identify and conserve regionally significant bushland on the Swan Coastal Plain portion of the Perth Metropolitan Region. *Bush Forever* proposes that certain areas of regionally significant bushland be reserved for Parks and Recreation in the MRS and/or acquired by the WAPC for inclusion in the conservation estate.

The criteria for determining additions to a regional park such as Rockingham Lakes are:

1. that the area is reserved for 'Parks and Recreation' in the MRS;
2. that the area has an appropriate tenure (such as an existing Crown reserve or freehold land acquired by the WAPC for inclusion in the Park);
3. that the area is identified by *Bush Forever* as being regionally significant; and
4. that the area provides a physical link to another area of the Park.

Once potential additions to the Park have been identified against the above criteria, the following considerations are taken into account to ensure that the Park boundary is manageable: condition of the land; future recreational demand; the enhancement of views; fire management; and provision of future services and roads.

In addition to the above factors, management resources need to be carefully considered when additional lands are being proposed for inclusion to the Park.

Based on the above criteria, and taking into account the above considerations, the Park boundary may be amended to include the following areas. These areas are shown in Figure 4.

1. An amendment to the MRS is in progress to reserve the portion of Reserve 27008 north of Safety Bay Road for 'Parks and Recreation'. The unvested reserve is located on the corner of Safety Bay and Mandurah Roads adjoining Tamworth Hill estate (Figure 4). The reserve constitutes part of *Bush Forever* site 356 and has conservation and landscape amenity value and is generally in good condition. Once the MRS is amended, the land will be included in the Park.

2. It is proposed to extend the Park to include an area of land south of Paganoni Swamp in the City of Mandurah, including part of Lot 105 and Lot 53 Lakelands. This area is reserved as 'Regional Open Space' in the Peel Region Scheme and has conservation and landscape values. It is therefore considered an appropriate addition to the Park. This proposal is subject to acquisition of some of the land by the WAPC and further discussions between DoP, DEC and the City of Mandurah (hence the boundary of the proposed addition represented on Figure 4 is indicative only).

3. The draft of this Plan proposed the inclusion of part Lot 4 (now part Lot 807) Mandurah Road in the Park, in exchange for Lot 1 (now Lot 805) Mandurah Road. Part Lot 807 was identified as regionally significant as part of *Bush Forever* site 395, whereas Lot 805 contains a disused quarry and was not considered regionally significant. Part Lot 807 has been acquired by the WAPC, and an amendment of the MRS to reserve it for 'Parks and Recreation' is in progress. Once the MRS is amended, the land will be included in the Park.

Additionally, a portion of Port Kennedy Town Lot 199 may be considered for inclusion in the Park. Port Kennedy Town Lot 199 is east of the Kennedy Bay Golf Course, north of Port Kennedy Drive, and west of Bayside Boulevard. Lot 199 is subject to a Crown lease, and is reserved for 'Public Purposes (Special Uses)' in the MRS. There may be scope to consider the inclusion of part of this area in the Park should land tenure and zoning issues be resolved. Stakehill Swamp will be considered for inclusion in the Park when land comprising the area has been acquired and consolidated by the WAPC to enable practical on-ground management.

Reserve 44004 adjacent to the Warnbro Sound foreshore, which is vested in the Conservation Commission and reserved for 'Parks and Recreation' in the MRS, has been added to the Park.

Possible excision from the Park – proposed Mangles Bay Marina Tourist Precinct

Proposals and studies for a boat harbour at Mangles Bay date back to the 1970s (Environmental Protection Authority, 1993b; Mangles Bay Boat Harbour Steering Committee, 1998) and pre-date the establishment of Rockingham Lakes Regional Park. More recently, the State government has proposed the Mangles Bay Marina Tourist Precinct (formerly known as the Cape Peron Tourist Precinct) for the eastern end of Cape Peron. Should the proposed development proceed, it would require land to be excised from the Park and given a new zoning in the MRS.

Given that a development application for the Mangles Bay Marina Tourist Precinct is yet to be lodged, an indicative area of the Park that may be affected by the project has been identified as an 'Area Subject to Further Planning' (Table 1 and Figure 4). This area is based on the Strategic Environmental Review prepared by the proponent in 2006. Should the proposed Mangles Bay Marina Tourist Precinct not proceed, the land tenure and management zoning of the area will be reviewed.

The proposed project boundary for the Mangles Bay Marina Tourist Precinct extends outside of the Rockingham Lakes Regional Park boundary north of Point Peron Road generally covering the area reserved for Port Installations in the MRS as well as a section of Mangles Bay itself. The final boundary will be determined through structure planning for the project.

Strategy

1. **Adopt the Park boundary as shown on Figure 3. The boundary will be modified should additional lands be included in the Park, or should land be excised. (Conservation Commission, DEC, WAPC, DoP, CoR) [High]**

8. Land Tenure

The objective is to ensure that the values of the Park are protected by security of tenure and reserve purpose.

Land within the Park consists of reserves administered under the *Land Administration Act 1997* and vested in a number of State government agencies and the City of Rockingham, as well as freehold land owned by government agencies and private organisations and individuals. Existing land tenure is shown on Figure 3.

The Plan seeks to reserve land and vest it in either the Conservation Commission, or the City of Rockingham (as outlined in Table 1).

Crown Reserves will be created using the management areas outlined in Table 1 and Figure 4 as a guide.

The tenure arrangements for some areas of the Park will not change, for instance, the Port Kennedy Scientific Park is to remain vested in the Conservation Commission as a nature reserve. It will continue to be managed for the maintenance and restoration of the natural environment, and to protect, care for and promote the study of indigenous flora and fauna and to preserve any feature of archaeological, historic or scientific interest. At Cape Peron (Reserve C48968) has already been transferred to the Conservation Commission and vested as a 5(1)(h) reserve for the purpose of Recreation. These tenure arrangements are an interim step until the status of the Mangles Bay Marina Tourist Precinct has been resolved. At that time the reserve will be converted to Class A and vested for the purpose of Conservation Park.

The City of Rockingham has advised that its acceptance of the vesting of Area 9 (Dixon Road Precinct) and Area 17 (Tamworth Hill Swamp) is conditional upon the City receiving suitable assistance to progress management plans and resultant capital works from the WAPC.

Should additional land be included within the boundary of the Park during the term of this Plan, its tenure arrangements will be consistent with the protection and enhancement of the Park's values.

Transfer of Western Australian Planning Commission-owned freehold land
Freehold land owned by the WAPC will be converted to reserves under the *Land Administration Act 1997* and vested with the Conservation Commission or the City of Rockingham. The land will be managed in accordance with this Plan.

Reserves created from WAPC freehold land and vested in the Conservation Commission will be afforded the purpose of 'Conservation Park' and will be classified as Class 'A' under the *Land Administration Act 1997* (Table 1).

As agreed by the City of Rockingham, reserves created from WAPC freehold land and vested in the City of Rockingham will be afforded an appropriate purpose and given similar tenure arrangements as the reserves vested in the Conservation Commission (Table 1).

Crown reserves and unallocated Crown land
It is proposed to negotiate a lease with the Department of Education (DoE) for a portion of Reserve 48968, to provide security of tenure for the education camp.

Crown reserves now vested in the City of Rockingham which are proposed to be vested in the Conservation Commission will be converted to class 'A' Reserves under the *Land Administration Act 1997* and afforded an appropriate purpose (Table 1).

Unallocated Crown Land is to be created as reserves and transferred to the Conservation Commission. These reserves will be afforded an appropriate reserve purpose and tenure arrangements under the *Land Administration Act 1997*, consistent with the protection and enhancement of Park values (Table 1).

Land vested in the Minister for Community Services at Port Kennedy is to retain its reserve vesting and purpose. The area is managed by the Department for Communities and operated as a youth camp (Table 1).

Road reserves
Liaison will occur between the City of Rockingham, WAPC, Department of Regional Development and Land (DRDL) and DEC to close road reserves adjacent to the Park that are considered unnecessary. Should road reserves be closed they will be amalgamated into adjoining reserves, which will be afforded an appropriate reserve purpose and tenure arrangement consistent with the protection and enhancement of Park values.

Roads at Cape Peron within Reserve 48968 vested in the Conservation Commission will be excised and transferred to the City of Rockingham for management as part of the local road network. The roads are: the western end of Point Peron Road, Memorial Drive and Lease Road. The City of Rockingham is investigating the potential to close Memorial Drive between Lease Road and Safety Bay Road.

Private property
Private property within the Park that is reserved 'Parks and Recreation' in the MRS is earmarked for acquisition by the WAPC. Until acquired by the WAPC, this land will remain protected under the MRS by the 'Parks and Recreation' reservation.

There are two parcels of private land in the Park. Lot 66 Safety Bay Road, on the north end of Lake Walyungup and Lot 14 Fifty Road which contains the Lakeside Youth Camp owned and managed by the Salvation Army, in the north-west corner of Tamworth Hill.

The Plan does not propose any changes to the management of the camp while it is in private ownership. However, when the land is acquired by the WAPC, management will be in accordance with the Plan's park management zones (Table 1 and Figure 4).

Access by Park visitors to private property in the Park is not available unless and until the property is acquired by the WAPC.

Strategies

1. **Liaise with the WAPC, DRDL and the City of Rockingham to create or transfer reserves to be vested in the relevant managing agency using Table 1 and Figure 4 as a guide. (DEC) [High]**

2. **Liaise with DRDL to create road reserves for the western portion of Point Peron Road, Memorial Drive and Lease Road, and transfer them to the City of Rockingham. (DEC, CoR) [High]**

3. **Liaise with the DRDL and WAPC to close road reserves in the Park that are considered unnecessary. (DEC, CoR) [Medium]**

4. **Continue to liaise with DoP and the Water Corporation regarding potential MRS amendments for lands reserved for 'Public Purposes' in the Park to be changed to 'Parks and Recreation'. (DEC) [Ongoing]**

Key performance indicators for land tenure
The success of the strategies will be measured by: 1. Tenure actions for which DEC and the Conservation Commission are responsible.
Target: 1. Complete all tenure actions for which DEC and the Conservation Commission are responsible.
Reporting: 1. Every 5 years.

9. Interim Management Arrangements

The objective is to ensure that interim management arrangements facilitate appropriate management of the Park.

Prior to the transfer of land to the appropriate agencies, there is a need to clearly define interim management arrangements between the agencies involved in managing land in the Park.

DEC will coordinate the interim management of the Park through the preparation of this Plan and by implementing management agreements prepared for WAPC-owned freehold land.

Interim management of Western Australian Planning Commission-owned freehold land
The management agreement for WAPC-owned freehold land is in the form of a Section 16 agreement under the CALM Act. Section 16 of the Act allows DEC to enter into formal agreements for the management of private land. The WAPC and DEC have a Section 16 agreement that covers land owned by the WAPC, except areas currently under lease. The agreement will stand until the land is transferred to the Conservation Commission or the City of Rockingham.

Interim management of Crown reserves, unallocated Crown land and freehold land owned by government agencies
The City of Rockingham is responsible for managing lands vested in it, in accordance with the objectives of this Plan. An integrated approach to the interim management of the Park will be coordinated by DEC through the implementation of this Plan.

Interim arrangements on private property
Where organisations or individuals hold land as private property, the owner is responsible for its management. DEC may seek formal management arrangements with private landowners in the Park.

Strategy

1. **Implement the WAPC-DEC management agreement under Section 16 of the CALM Act. (DEC, WAPC) [High]**

10. Park Management Zones

The objective is to adopt a management zoning system that seeks to protect conservation values, provides for appropriate recreation and other uses, and provides for efficient management of the Park.

Management zones are a framework for protecting the Park by identifying areas of conservation and recreation value, and determining appropriate uses and activities. The aim is to minimise existing and potential conflicts between uses and activities. Management zones provide broad guidance to public use and management activities that are appropriate in certain Park areas and indicate which management objectives have priority in a given area. A clear zoning scheme will also help to communicate management intentions to the public.

The management zones and areas for the Park are illustrated in Figure 4. The zones provide a guide for the future vesting and tenure arrangements of Park areas. They should not be used as a detailed schedule for changing land tenure. The zoning scheme does not affect the tenure arrangements or management of the service and utility reserves in the Park.

Five zones have been identified for managing the Park:

a) Conservation and Protection;
b) Natural Environment Uses;
c) Recreation;
d) Special Use; and
e) Area Subject to Further Planning.

Refer to Table 1 for the management emphasis and acceptable uses and facilities within each zone.

Given that the future of the proposed Mangles Bay Marina Tourist Precinct is yet to be decided by the State government, that area of the Park that may be affected by the proposal has been identified as an ‘Area Subject to Further Planning’ (Table 1 and Figure 4). Should the proposed Mangles Bay Marina Tourist Precinct not proceed, the land tenure and management zoning of the area will be reviewed.

The zoning scheme does not direct the management of privately owned freehold land held by individuals or organisations in the Park. However, where the land is acquired by the WAPC, management will be in accordance with the Plan's park management zones.

Strategy

1. **Base future management of the Park on the Management Zones (Table 1 and Figure 4). (DEC, CoR) [Ongoing]**

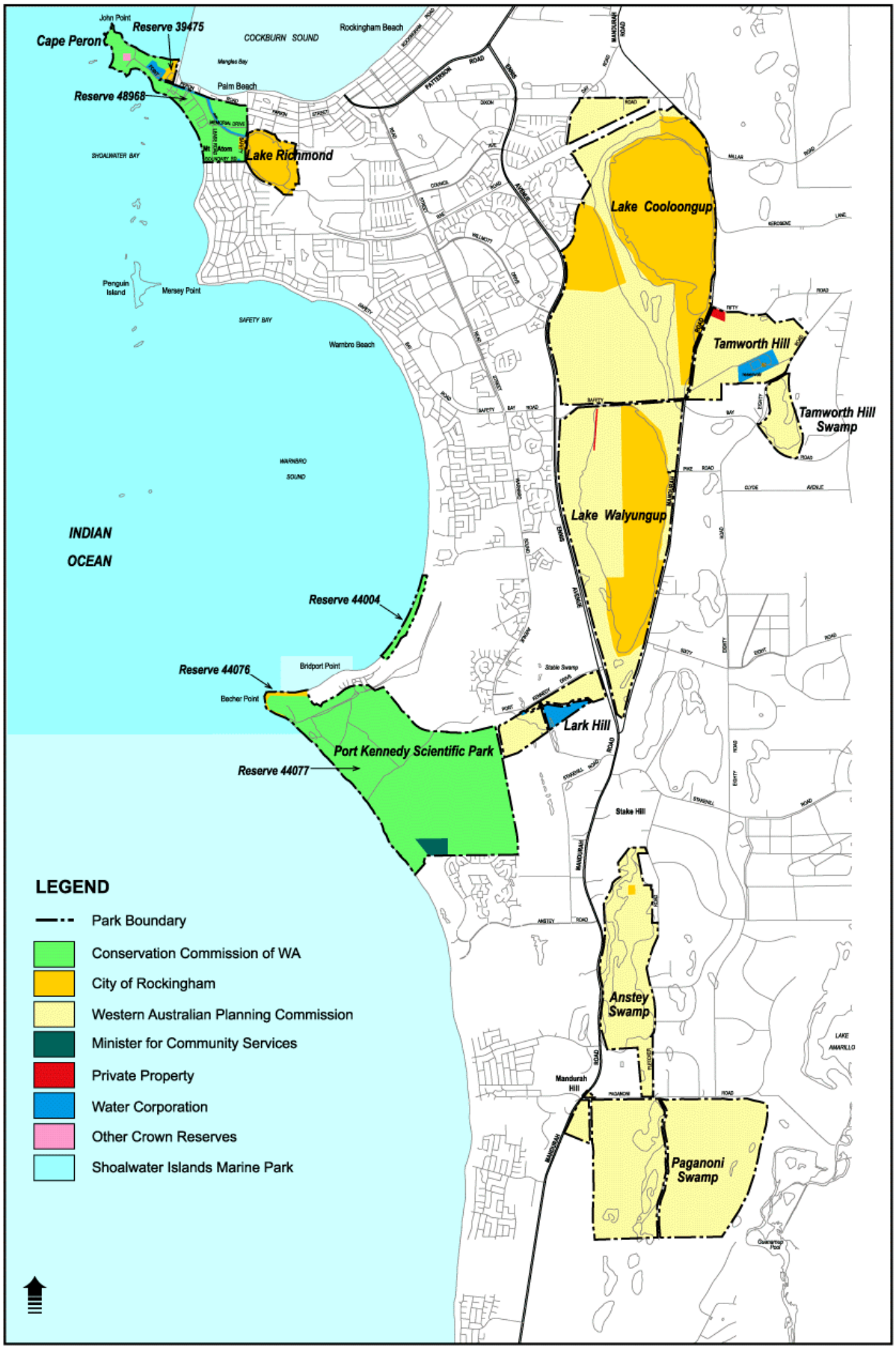


Figure 3 - Land Tenure and Park Boundary

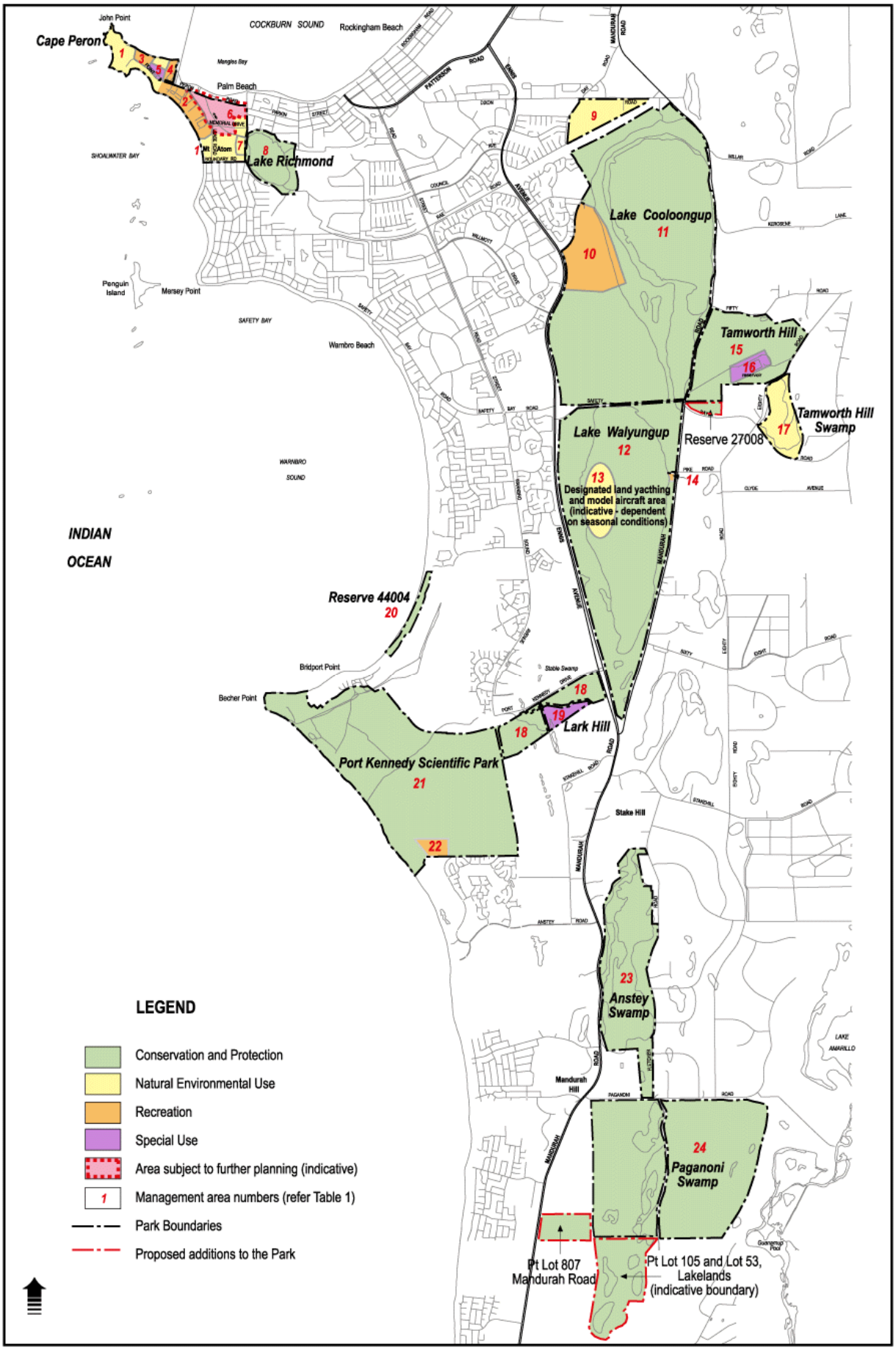


Figure 4 - Management Zones and Areas

Table 1 - Management Zones and Future Tenure Arrangements

MANAGEMENT ZONES					FUTURE TENURE ARRANGEMENTS		
Management Zone	**Plan Area**	**Management Agency**	**Management Emphasis**	**Acceptable Uses and Facilities**	**Plan Area**	**Reserve Purpose**[i]	**Vested Authority**
Conservation and Protection	8	CoR	The management emphasis of this zone is to protect and where possible enhance the conservation values (biota and heritage) as well as the landscape qualities of the Park. Priority will be given to restoring and maintaining the natural state of conservation and protection areas. Visible evidence of management will be minimal.	Public access restricted to nature trails, boardwalks, observation platforms, bird hides and cycle paths primarily for through access. Some facilities acceptable in certain locations (Recreation Masterplan – Appendix A). Unauthorised vehicles and water-craft prohibited. Rehabilitation of vegetation and habitat protection will be undertaken. Education, interpretation and research uses are appropriate.	8	Conservation and Public Recreation	Rockingham City Council
	11	DEC			11	Conservation Park	Conservation Commission
	12	DEC			12	Conservation Park	Conservation Commission
	15	DEC			15	Conservation Park	Conservation Commission
	18	DEC			18	Conservation Park	Conservation Commission
	20	DEC			20	Conservation of flora and fauna	Conservation Commission
	21	DEC			21	Conservation of flora and fauna	Conservation Commission
	23	DEC			23	Conservation Park	Conservation Commission
	24	DEC			24	Conservation Park	Conservation Commission
Natural Environment Use	1	DEC	The management emphasis is to provide for appropriate uses of the natural environment. Areas will be managed jointly for public use, conservation and enhancement of flora and fauna, and improvement of landscape qualities. Public use must be compatible with the assigned purpose of the relevant reserve. Visible evidence of management may be moderate to high. Management will encourage uses and develop facilities that promote conservation and education.	Public access primarily by walk trails and cycle paths. Approval has been given for model aeroplane and land yacht sailing club activities on a seasonal basis at Lake Walyungup, under conditions managed by DEC. Through access by vehicles along established roads is allowed. Some development of facilities may be necessary. These may include education nodes and facilities associated with visitor use. The provision of facilities will depend on the values of an area. Commercial concessions may be appropriate. Rehabilitation and habitat protection will be necessary.	1	Conservation Park	Conservation Commission
	7	CoR			7	Environment Centre	Rockingham City Council
	9	CoR			9	Conservation and Public Recreation	Rockingham City Council
	13	DEC			13	Conservation Park	Conservation Commission
	17	CoR			17	Conservation and Public Recreation	Rockingham City Council

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Table 1 (continued) - Management Zones and Future Tenure Arrangements

MANAGEMENT ZONES					FUTURE TENURE ARRANGEMENTS		
Management Zone	**Plan Area**	**Management Agency**	**Management Emphasis**	**Acceptable Uses and Facilities**	**Plan Area**	**Reserve Purpose**	**Vested Authority/ Owner**
Recreation	2 3 4 10 14 22	DEC DEC CoR CoR DEC Department for Communities	The prime emphasis of management will be to provide a variety of recreation opportunities. The type and scale of facilities provided will depend on the values of any given area, community demand for recreation and the appropriate management of the Park. Management involves minimising the impact of visitor activities through the sensitive placement and provision of access and facilities as well as through the provision of information and interpretive material. Visible evidence of management may be high.	Public use may be high in these areas. Predominantly passive recreation pursuits, allowing for Park service and picnic facility development. Commercial concessions are considered appropriate within this management zone. Rehabilitation, landscaping and reticulation of areas may be necessary.	2 3 4 10 14 22	Conservation Park Conservation Park Recreation, Parking and Sea Rescue Centre Recreation (golf course) Conservation Park Government Requirements	Conservation Commission Conservation Commission Rockingham City Council Rockingham City Council Conservation Commission Minister for Community Services
Special Use	5 16 19	Water Corporation Water Corporation Water Corporation	Management for purposes other than conservation, recreation or visitor services.	Private lease or freehold land. No public access. Access for managing agencies as required.	5 16 19	Sewage treatment works Reservoir and access Not Applicable	Water Corporation Water Corporation Water Corporation
Area Subject to Further Planning	6	DEC	This management zone represents an emphasis on conserving the area's existing values. Long term management will depend on the outcomes of further planning and State government decisions regarding the Mangles Bay Marina Tourist Precinct. Should this proposal not proceed, the land tenure and management zoning of this area will be reviewed.	Current uses and facilities will be maintained. Long term management will depend on the outcomes of further planning and State government decisions regarding the Mangles Bay Marina Tourist Precinct.	6	Subject to Further Planning	Subject to Further Planning

[1]Definitions of reserve purpose for reserves vested in the Conservation Commission and managed by DEC under the CALM Act:

- 'Conservation Parks' are reserves established to meet as much of the demand for recreation by members of the public as is consistent with the proper maintenance and restoration of the natural environment, the protection of indigenous flora and fauna and the preservation of any feature of archaeological, historic or scientific interest;
- 'Conservation of flora and/ or fauna' are designated reserve purposes for nature reserves. Nature reserves are established to maintain and restore the natural environment, and to protect, care for, and promote the study of, indigenous flora and fauna, and to preserve any feature of archaeological, historic or scientific interest.

The purpose of reserves vested in other agencies depends on the reason for their gazettal.

11. Integrated Management and Planning of the Park and Adjacent Areas.

The objectives are to provide for the effective involvement of the managing agencies and the community in managing the Park and to integrate the management and planning of the Park with adjacent areas.

THE PARK MANAGEMENT STRUCTURE

The managers of the Park are DEC and the City of Rockingham. Their areas of responsibility are set out in the previous section on management zones (Table 1). Management will be in accordance with the strategies outlined in this Plan.

DEC is the most appropriate agency to provide a strong integrated framework for management of complex conservation and recreation areas. DEC is responsible for managing areas of the Park vested in the Conservation Commission and for the overall coordination of management. The City of Rockingham will manage areas of the Park vested in it, in accordance with the strategies outlined in this Plan. Responsibility for overall planning such as changes to the MRS for regional parks, as well as the acquisition of private land within the Park, is retained by the WAPC.

Close cooperation is required by the managing agencies and the community for this Plan to be implemented efficiently and effectively. Management decisions will involve input and negotiation between the land managing agencies. DEC will refer strategic and policy issues to the Conservation Commission for consideration as required. Where appropriate, working parties comprising representatives from DEC and the City of Rockingham will be established to facilitate the preparation of subsidiary plans for the Park. The different levels of planning are illustrated in Figure 1. Subsidiary plans have been and will be prepared in consultation with the community.

There is a strong interest by Aboriginal people to be involved in the management of conservation estate in Western Australia and to strengthen cultural ties to the land. By working together with Aboriginal people to care for the land, there will be great benefits for the preservation of heritage and conservation of the environment, as well as for cross-cultural awareness.

The State government has shown a commitment to explore joint management arrangements for conservation reserves with traditional owners by releasing a consultation paper outlining options for ownership, administration and joint management of conservation lands in Western Australia (Department of Conservation and Land Management, 2003). This paper includes options for the management of conservation reserves, irrespective of the status of Native Title.

A common management direction

This Plan represents the establishment of common objectives, strategies and agreement on priorities, and has been developed collaboratively by DEC and the City of Rockingham, in consultation with the community. DEC will liaise with other management agencies and the Rockingham Lakes Regional Park Community Advisory Committee to review management projects and priorities.

INTEGRATED LAND USE PLANNING FOR AREAS ADJACENT TO THE PARK

Many impacts and threatening processes on the Park emanate from surrounding land uses and activities, particularly from within the catchments of the Park's wetlands.

Planning for areas surrounding the Park is determined at both the State and local level. At the State level, the WAPC is responsible for administering the MRS. The MRS directs land use in the Perth metropolitan area by defining the future use of land, and dividing it into broad zones and reservations.

At the local level, the MRS requires local government town planning schemes to provide detailed plans for their part of the region. These town planning schemes must be consistent with the MRS.

It is not the intent of this Plan to provide strategies to guide land uses and activities outside the Park. Planning mechanisms such as the MRS and town planning schemes as well as environmental assessment procedures have been established to guide land use decisions. Land-use planning within the catchments of the Park needs to consider potential adverse environmental impacts on the Park, and in particular, the Park's wetlands. Planning and environmental assessment authorities should discourage adjacent land-use practices that may lead to the leaching and run-off of nutrients and pollutants into wetland systems, or other unacceptable impacts on the values of the Park.

Strategies

1. **Establish, where appropriate, working parties representing the managing agencies for subsidiary and other implementation plans. (DEC, CoR) [High]**

2. **Consult with the Rockingham Lakes Regional Park Community Advisory Committee regarding park management as appropriate. (DEC, CoR) [High]**

3. **Refer policy issues to the Conservation Commission for consideration as required. (DEC) [Ongoing]**

12. Key Performance Indicators, Monitoring and Reporting

The objective is to set performance criteria for assessing the implementation of this Plan in order to track the effectiveness of the Plan in meeting its objectives.

KEY PERFORMANCE INDICATORS

Defining key performance indicators (KPIs) in management plans reflects the need for the Park managers to take an outcome-based approach from which the effectiveness of management can be assessed.

The role of KPIs in this Plan is to provide an indication of:

1. ecosystem health in the Park;
2. use of the Park by the community; and
3. the performance of DEC in implementing the Plan.

KPIs do not cover all objectives or strategies, but they have been selected to give a strategic indication of how well the values of the Park are being maintained. KPIs therefore relate specifically to the key ecological and social values of the Park (see Table 3). KPIs have been identified in the following sections of the Plan:

- Land Tenure (Section 8);
- Flora and Vegetation (Section 18);
- Threatened Ecological Communities (Section19);
- Fauna (Section 20);
- Weeds (Section 21);
- Visitor Use (Section 31);
- Community Involvement (Section 44).

KPIs underpin the audit process of this Plan (Section 48).

MONITORING AND REPORTING

DEC will monitor KPIs and will periodically report to the Conservation Commission. The Conservation Commission will take appropriate action where performance targets are not met.

Community groups can play a valuable role in monitoring and should be encouraged to be involved and provided with training where feasible.

DEC will liaise with agencies and organisations undertaking monitoring activities in the Park. This will help ensure an integrated approach that avoids duplication and allows programmes to be assigned appropriate priorities.

Strategies

1. **Establish baseline information and ongoing monitoring programmes within the Park, using the KPIs as a basis. (DEC) [High]**

2. **Report to the Conservation Commission on Park management as required. (DEC) [High]**

3. **Audit and measure the overall effectiveness of Park management based on the KPIs. (Conservation Commission) [Ongoing]**

13. Research

The objective is to further develop and maintain knowledge in regard to visitor use, management, natural processes, and other external influences on the Park.

There are many opportunities for research within the Park. Research needs to be integrated to maximise the outcomes and application of knowledge.

The threatened ecological communities are unique and of ecological and scientific importance. The Rockingham-Becher Plain and the Becher Point Wetlands Ramsar site are also significant, and offer unparalleled opportunities for research on wetland evolution and Holocene sea level fluctuations. These areas are considered priorities for ongoing scientific research. The Semeniuk Research Group has conducted seminal research in these areas.

Additionally, there is a particular need to research and monitor the wetland environments in the Park and their catchments to assess factors such as water quality, water levels, groundwater interaction and salinity. DEC will liaise with agencies and organisations undertaking water monitoring in managing the Park.

Visitor impacts, management impacts and external influences all need to be subject to continual evaluation. Since accepting management responsibility of the Park, DEC has undertaken three studies into visitor use in areas of the Park – Barnes (1998) and Colmar Brunton (2001) and (2005). These studies provide information to allow more informed management decisions regarding recreational use of the Park.

The involvement of educational institutions, community groups such as the Naragebup Rockingham Regional Environment Centre, and individual researchers is encouraged, to promote community ownership and gain valuable knowledge for use in the management of the Park. The involvement of such groups reduces the cost of research and monitoring for the managing agencies and enables projects, which possibly would not be given priority or consideration, to be undertaken. Community groups are encouraged to be involved in research where appropriate.

Research and monitoring programmes in the Park include monitoring of water quality entering Lake Richmond by the Water Corporation and monitoring of water quality in Lake Richmond and the Rockingham Main Drain outlet by Naragebup Rockingham Regional Environment Centre. The developers of Kennedy Bay also undertook to conduct monitoring of groundwater levels and quality as a condition of development approval (Bowman, Bishaw, Gorham, 1994).

A project jointly managed by DEC, the Regional Herbarium, and the Naragebup Rockingham Regional Environment Centre called 'Surveying Western Australia's Littoral Ecology (SWALE)' was undertaken in Port Kennedy Scientific Park (Tauss, 2002). The project was funded by Coastwest-Coastcare and involves flora survey of permanent transects in coastal areas. The sites within the Port Kennedy Scientific Park include the threatened wetlands, beach ridge plain and Becher Point.

A scientific purposes licence is required for the taking of flora and/ or fauna from the Park for research purposes.

Strategies

1. **Support and where possible seek funding to undertake scientific research within the Park. (DEC, CoR) [Ongoing]**

2. **Encourage the participation of volunteers, educational institutions and other organisations in research projects within the Park. (DEC, CoR) [High]**

C. CONSERVING THE NATURAL ENVIRONMENT

14. Guiding Principles for Conserving the Natural Environment

1. Conservation and protection of the natural environment
Natural processes and biodiversity will be managed to maintain their inherent values. External impacts from human use, the surrounding urban area and management practices will be minimised in order to maintain the biodiversity of natural systems over the long term.

2. Park management priorities
The Park will be managed for conservation and environmental enhancement. Recreation and other uses will be allowed to occur to the extent that they do not adversely impact on the natural environment.

3. Restoration of the natural environment
Restoration of the natural environment will be undertaken to protect and maintain biodiversity and natural systems. Areas with high nature conservation significance will be considered priorities for restoration.

4. Features requiring special protection
Declared rare flora, priority and significant flora species, threatened ecological communities, priority fauna and other specially protected fauna will be given priority for conservation and restoration.

5. Consistency of management policies
The land managers involved in the Park will apply consistent and coordinated management policy.

6. Appropriate reserve purpose
Reserves within the Park will be assigned an appropriate purpose for the protection of biodiversity and natural systems over the long term.

7. Recognition of cultural and social values
The Park will be managed in a way that delivers community benefits by maintaining cultural traditions and places of cultural significance and by providing opportunities for recreation, education and research.

8. Precautionary principle
If there are threats of serious or irreversible environmental damage, the lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

Strategy

1. **Apply the above principles as required in conserving the natural environment of the Park. (DEC, CoR) [Ongoing]**

15. Geomorphology, Geology and Soils

The objective is to protect and conserve the existing geomorphological structure and soil associations of the Park.

At Rockingham, the rise and fall of the landmass and sea levels have been recorded in a series of past shorelines that, together with climatic and oceanic processes, have contributed to the unique landforms and soil characteristics of the Park.

GEOMORPHOLOGY

The Park lies on two major geomorphic landforms: the Quindalup Dune System and the Spearwood Dune System (McArthur and Bettenay, 1960; Tingay and Associates, 1996; Government of Western Australia, 2000).

The Quindalup Dune System is a relatively recent landform that occurs along the Western Australian coast from Dongara to Geographe Bay. It comprises marine sands and a variety of dune types as a result of variation in climate, geology, regional geomorphology, coastal processes and vegetation cover.

Within the Park, the Quindalup Dune System is made up of Safety Bay Sands, which forms a distinct and significant geomorphic unit known as the Rockingham-Becher Plain (Gozzard, 1983, Tingay and Associates, 1996). The Rockingham-Becher Plain consists of a series of parallel sand ridges with intervening poorly-developed swales. The parallel dunes along the coast mark the positions of earlier coastlines. The plain is significant because it provides one of the best examples in the world of sand accumulation and stratigraphic evolution over the Holocene period (Searle et al., 1988). Consequently, it has been possible to establish the history of shoreline growth, sea level movement, soil development and wetland development through study of the plain

(Woods, 1988). Cape Peron, Port Kennedy, Lark Hill, Lakes Richmond, Cooloongup and Walyungup are all located within the Rockingham-Becher Plain.

In addition to the unique Rockingham-Becher Plain, the Park contains the interesting geomorphic features of Cape Peron and Becher Point within the Quindalup Dune System. These promontories are cuspate forelands, which have formed where sand has been trapped and deposited in the lee of off-shore islands and reefs (Rippey and Rowland, 1995). Cape Peron was an island that was progressively connected to the mainland as sand accumulated (Rippey and Rowland, 1995).

The Spearwood Dune System is older than the Quindalup Dune System, and appears as a series of shore parallel ridges and depressions comprised of Tamala Limestone (Gozzard, 1983). This system occurs to the east of Lakes Cooloongup and Walyungup. Paganoni, Anstey and Tamworth Hill Swamps are wholly contained within this system.

The geomorphology of the Park is one of the characteristics that may be presented in educational and interpretive material (Section 45).

GEOLOGY AND SOILS

The surface geology of the Park comprises various sediments from marine and estuarine origin deposited during the Pleistocene (1.8 million to 7,000 years before present) and Holocene periods (7,000 years to present).

In general, the soils in western parts of the Park are typical of the Quindalup Dune System. They are calcareous, having been built up from marine deposits, and are deficient in trace elements (Woods, 1988). The most extensive geological unit is the Safety Bay Sands, which covers Cape Peron, Port Kennedy, Lark Hill and is dominant around Lakes Richmond, Cooloongup and Walyungup. In places, this unit overlies Becher Sands and Tamala Limestone formation (Woods, 1988).

Soils of the Spearwood Dune System are commonly derived from Tamala Limestone. Tamala Limestone was deposited around 100,000 years before present, and the sediments have since been cemented into porous limestone (Woods, 1988). Tamala Limestone is visible on the surface at Tamworth Hill Swamp (Tingay and Associates, 1996).

Wetlands within the Park also occur on Holocene swamp deposits, and in the case of Lakes Richmond, Cooloongup and Walyungup, on lagoonal and estuarine deposits, which reflect their origins.

Erosion from uncontrolled access

Erosion is a threat to the geomorphology, geology and soils of the Park. Uncontrolled access to coastal areas may denude vegetation, which opens soils to accelerated levels of erosion. This may be effectively controlled by constructing access paths, fencing, rehabilitating denuded dune areas with native vegetation, and using wood chipped mulch, coconut mesh mats or brushing with tree prunings to stabilise sand. This is discussed further in regard to visitor access (Section 35).

Strategy

1. **Restrict access to areas at risk from erosion by implementing the Recreation Masterplan and site enhancement plans (Appendix A) and by providing fencing, signs and information (Sections 36 and 45) (DEC, CoR) [Ongoing]**

16. The Coast and Foreshore

The objective is to maintain and improve the ecological condition of the coast adjoining the Park to ensure the continuity of natural systems in the Park.

Climatic and oceanic forces shift sediments and form and rework landforms. These changes to the coastline adjoining the Park may have implications for management.

The proximity of the Shoalwater Islands Marine Park increases the opportunity for completing research and understanding of local coastal processes and ecosystems (Tingay and Associates, 1997).

WINDS, WAVES, SURFACE CURRENTS AND TIDES

Wind is an essential element in wave generation and water circulation (currents and eddies). For much of the year, winds in the coastal areas of Rockingham are offshore in the mornings and evenings and onshore in the afternoon. In the summer months, winds from the south-west are dominant, while in winter, dominant winds are from the north-west, west and south-west (Woods, 1988).

Along with winds, waves are drivers of coastal processes. Their energy is affected and dissipated by the shape and composition of the shore and presence or absence of longshore sandbars, islands and reefs (Beer, 1997).

Offshore islands and reef systems substantially protect Shoalwater Bay and Warnbro Sound from wind and wave energy. This limits sediment movement in and out of Shoalwater Bay (Green, 1997).

Surface currents are formed by the wind blowing over the surface of the ocean. Dominant west to south-westerly winds frequently generate a northerly current, which interacts with wave energy to move beach sand in a northerly direction.

SEDIMENT MOVEMENT

Wind, waves and currents all influence sediment movement along a shoreline, on-shore, and off-shore, causing some areas to erode (lose sand) and others to accrete (gain sand). Geographical features such as points and bays can trap or restrict the movement of sand. Similarly, artificial structures in the coastal zone affect the flow of sediment.

Wind, waves and currents along the coast of Western Australia transport large quantities of sand. Southerly to westerly winds create a predominantly northward long-shore drift. Generally, erosion occurs on south-west facing coasts, such as south of Becher Point, with sand being deposited on the leeward side of forelands and rocky promontories, such as on the north side of Becher Point and Cape Peron. This northerly longshore drift can be reversed and in some instances counteracted during winter storms (Tingay and Associates, 1996; Rippey and Roland, 1995; Woods, 1988).

Erosion and Accretion

As a naturally occurring process, marine erosion is generally not considered a management issue, unless it threatens the values of the Park, visitor safety or built facilities and infrastructure. Similarly, accretion is not generally a management concern, except when considering the placement of visitor facilities in the Park.

Shoreline movement and sediment transport patterns affecting the two coastal areas of the Park (Cape Peron and Port Kennedy) are illustrated in Figure 5 and are described below.

The northern side of Cape Peron has accreted substantially: a distance of 72 metres between 1942 and 1994 at the most significant point (Department for Planning and Infrastructure, undated). This sediment would usually move eastwards along the Mangles Bay coast, however the construction of a boat ramp and Garden Island causeway has interrupted this flow. Sediment accumulates in the marine area between the boat ramp and Garden Island causeway causing a management problem. Agreement has been reached with DEC for the City of Rockingham to extract sand from this area for use in other areas.

Over the past decade, mass accretion of the beach towards the Point Peron Boat Ramp has been occurring while the western section of Mangles Bay near DoE's Point Peron School Camp has been eroding. Severe winter storm events since 2005 have threatened the Point Peron School Camp and have caused visitor risk management issues. DEC will liaise with the City of Rockingham, DoE and the Marine Parks and Reserves Authority regarding measures such as sand replenishment or possibly the construction of a barrier to protect the Camp.

Marine erosion is occurring on the southern side of Cape Peron (CoastWise, 2001), where it threatens some of the recreation camps. Sustained erosion of this area in the longer term may cause a risk to existing infrastructure, such as roads and Water Corporation infrastructure.

The northern side of Becher Point has generally been accreting. However the southern face of Becher Point is eroding at a significant rate of approximately 5 to 6 metres each year (Rippey and Rowland, 1995). The most pronounced recession has occurred immediately south of the point, where the shoreline moved eastwards by 407 metres over the period between 1942 and 1994 (Department for Planning and Infrastructure, undated). However, this does not currently present any management problems.

Strategy

1. **Ensure long-term planning for the Park and developments within the coastal zone considers the likelihood and implications of coastal erosion and accretion. (CoR, DEC) [Ongoing]**

2. **Liaise with the City of Rockingham, DoE, the Marine Parks and Reserves Authority and any relevant State agencies regarding measures such as sand replenishment or possibly the construction of a barrier to protect the DoE's School Camp from marine erosion (DEC) [High].**

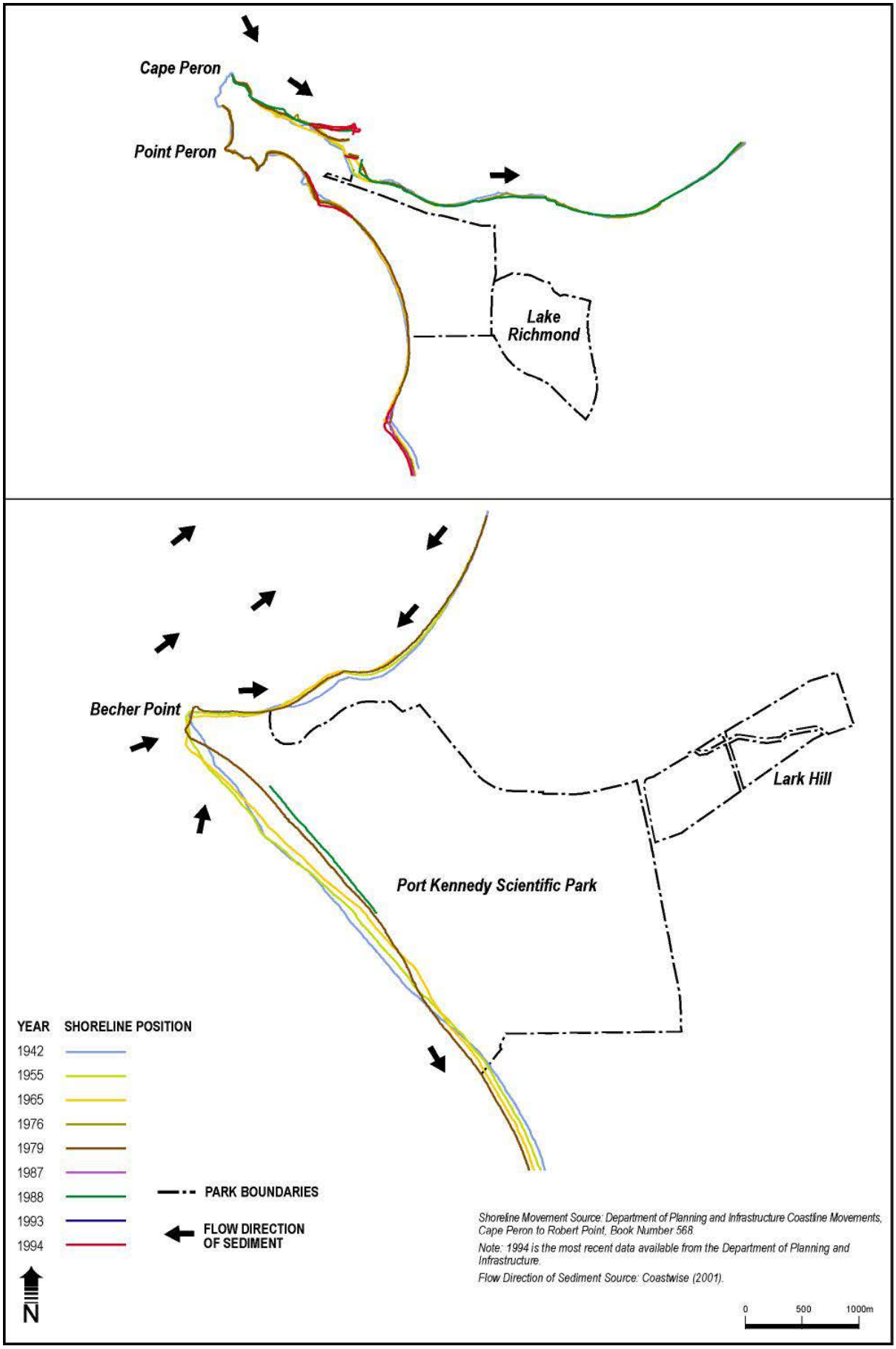

Figure 5 - Conceptual view of shoreline movement

17. Hydrology and Wetlands

The objective is to protect and conserve wetland environments within the Park.

HYDROLOGY

Fresh groundwater in the Rockingham region occurs in the Safety Bay and Rockingham aquifers.

The Safety Bay aquifer is shallow and unconfined, and forms an elongated mound midway between the coast and Lakes Cooloongup and Walyungup (Woods, 1988). The groundwater flows both towards the coast and the lakes. In some sections near the two lakes the groundwater is bordered by a clay barrier (Bowman Bishaw Gorham, 1997). Overall the aquifer covers an area of approximately 50 square kilometres, and contains potable water.

The deeper Rockingham aquifer, which is separated from the Safety Bay Sands by a thin (1 to 2 metres) layer of clay or indurated limestone, also contains potable water (Coastwise, 2001).

WETLANDS

Wetlands are a valuable environmental asset because they support diverse ecosystems and contribute to the State's biodiversity. Most wetlands on the Swan Coastal Plain have been dramatically modified by surrounding land uses and development.

Wetlands in the south-west of Western Australia are influenced greatly by the Mediterranean climate; it is a normal occurrence that water levels rise during wetter winter months and dramatically decrease in summer. This seasonal hydrological cycle creates biological, chemical and physical characteristics that are unique to wetlands on the Swan Coastal Plain.

The Park contains a number of wetlands, including Lake Richmond, Lake Cooloongup, Lake Walyungup, Tamworth Hill Swamp, Becher Point Wetlands at Port Kennedy, Anstey Swamp and Paganoni Swamp. These range in size, salinity, permanence and depth.

Significance of wetlands in the Park

The wetlands in the Park are recognised and protected at State, national and international levels.

At the State level, all wetlands within the Park are Conservation Category Wetlands. These wetlands support a high level of ecological attributes and functions (Water and Rivers Commission, 2003). In addition, Lake Richmond, Lake Cooloongup, Lake Walyungup, Tamworth Hill Swamp, Anstey Swamp and Paganoni Swamp are protected under the State's *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992*. Wetlands identified under this policy are protected from unauthorised effluent disposal, filling, mining and drainage.

The Australian Heritage Council has listed Lake Richmond, Lakes Cooloongup and Walyungup and surrounds, Paganoni Swamp and the Port Kennedy area on the Register of the National Estate as areas that have heritage values and that should be conserved (Australian Heritage Council, 2009). Port Kennedy Scientific Park and Lake Richmond are listed on the City of Rockingham's Municipal Heritage Inventory.

The Becher Point Wetlands are nominated as 'wetlands of international importance' under the Ramsar Convention and are therefore subject to protection under the Commonwealth EPBC Act 1999 (Ramsar, 2002; also see Glossary). Any activities that have, will have or are likely to have significant impact on these wetlands will require approval under the EPBC Act 1999. The Becher Point Wetlands are also nominated on the Directory of Important Wetlands in Australia (Environment Australia, 2001). The directory identifies nationally important wetlands across Australia and provides information on the wetlands and the dependent flora and fauna. The Becher Point wetlands were included because they are a good example of a wetland type occurring in a biographic region in Australia, and because they are of outstanding historical or cultural interest.

Lakes Richmond, Cooloongup and Walyungup are locations used by bird species identified under international migratory bird agreements. These bird species are also subject to protection under the Commonwealth EPBC Act 1999. Any activities that have, will have, or are likely to have significant impact on these species will require approval under the EPBC Act 1999.

Lake Richmond

Lake Richmond is a perennial freshwater lake that is perched about one metre above sea level, and is up to 15 metres deep (Australian Heritage Council, 2009). The Lake evolved from a marine embayment and historically contained saline water. In the mid to late 1960s, drains were installed for surface and storm water discharge from the surrounding Rockingham and Safety Bay area and this has contributed to the decreasing salinity of water in the Lake (Goodale *et al.*, 1998; Arnold, 1990). There are three inlets to the Lake and one outlet drain that flows to the ocean. Sluice gates have been installed on the outlet drain to prevent salt water intrusion (Tingay and Associates, 1996).

Lake Richmond provides a habitat for a threatened ecological community of thrombolites (Section 19). It is thought that an increase in salinity would likely have more significant impacts on the function of the thrombolites than a decrease in salinity (English *et al.*, 2003).

Lakes Cooloongup and Walyungup
Lakes Cooloongup and Walyungup are both shallow, saline lakes that were once connected to the ocean. The water levels in both of these wetlands are dependent on groundwater flows and rainfall, with depths ranging from 0.5 to 3.5 metres (the deepest areas being in the permanent pools of Lake Walyungup). Lake Cooloongup is significantly less saline than Lake Walyungup, however both lakes are thought to be increasing in salinity (Tingay, 1977; Australian Heritage Council, 2009). Anecdotally, the lakes seem to be drying, and this may be a function of decreasing rainfall in the recent past.

The limestone ridge to the east, the dunes to the west and the dunes separating the lakes act as groundwater divides between Lakes Cooloongup and Walyungup, such that each lake has a separate hydrological system. Lake Cooloongup has a saline groundwater outflow towards the sea, while Lake Walyungup is a closed system with evapotranspiration the only form of discharge (Tingay and Associates, 1996). Each lake is surrounded by small drainage basins. An interesting feature is the presence of small freshwater wetlands and seepages along the western edge of the lakes (Tingay and Associates, 1996).

Becher Point Wetlands Ramsar Site
The Becher Suite of wetlands has been estimated as one of the youngest on the Swan Coastal Plain. The Becher Point Wetlands Ramsar Site within Port Kennedy Scientific Park refers to a number of small sumplands (seasonally inundated basin) and damplands (seasonally waterlogged basin) that are located within the dune swales, arranged roughly parallel to the coast (Semeniuk and Semeniuk, 1995). The wetlands are surface expressions of the groundwater.

The Becher Point Wetlands Ramsar Site is of conservation and scientific value because collectively the wetlands represent an evolutionary time sequence. The youngest wetlands are located near the coast, with progressively older wetlands further to the east. This provides an excellent record to compare the wetlands' characteristics as they evolve over time (Semeniuk Research Group, 1991).

The ecological character of the Becher Point Wetlands Ramsar Site is described in relevant sections of this Plan, including the discussion on the sedgeland in Holocene dune swales threatened ecological community, which occur in the wetlands (Section 19). The Ramsar criteria met by Becher Point Wetlands are as follows:

1. The Becher Point Wetlands are an example of shrub swamps and seasonal marshes that have formed in an extensive sequence of inter-dunal depressions that have arisen from the seaward advancement of the coastline over recent millennia. This type of wetland system is rare in south- western Australia. Examples of this type of geomorphological sequence in equally good condition and within a protected area are rare world-wide.

2. The sedgelands that occur within the linear wetland depressions of the Site are listed as a threatened ecological community under the Commonwealth EPBC Act 1999. The listing is recorded as 'Sedgelands in Holocene dune swales of the southern Swan Coastal Plain'.

Tamworth Hill, Anstey and Paganoni Swamps
Tamworth Hill, Anstey and Paganoni Swamps are part of the Stakehill Suite of wetlands, and may be described as sumplands or seasonally inundated lowlands (Hill *et al.*, 1996). Tamworth Hill is fresh water, whereas Anstey and Paganoni Swamps are fresh to brackish wetlands.

THREATS TO WETLANDS AND GROUNDWATER

Key threats to the wetlands and/or groundwater of the Park include:

- pollution including eutrophication;
- hydrological changes;
- salinisation;
- impacts of surrounding developments;
- aquatic and other environmental weeds (Section 21);
- insect pest control (Section 20);
- fire (Section 22); and
- aesthetic disruption (Section 25).

Pollution including eutrophication
All wetlands in the Park are susceptible to pollution because of their connection to groundwater and because they receive surface runoff from surrounding urban areas.

There is a high risk of groundwater contamination because the Safety Bay aquifer is unconfined and is recharged by rainfall (Woods, 1988). Pollutants such as chemicals, pesticides and excess nutrients from the Rockingham area may easily infiltrate the permeable Safety Bay Sands.

Pollutants may be carried to the wetlands by surface runoff. Lake Richmond is particularly at risk because it receives surface and stormwater runoff from three drains, however the mobility of phosphorous is reduced by carbonate in the soils in this area. The risk of nutrient enrichment and presence of other pollutants is recognised in the Interim Recovery Plan that has been developed for the threatened ecological community of thrombolites (Section 19). The City of Rockingham has undertaken drainage improvement works on the drainage network upstream of Lake Richmond. This has occurred in conjunction with a community awareness strategy to reduce the amounts of

domestic pollutants entering the drain. Additionally, urban developments near Lake Richmond have been designed to contain stormwater on-site and dispose of stormwater through soak basins.

Pollutants may include compounds of nitrogen and phosphorus, suspended solids, oils and other hydrocarbons, pesticides, heavy metals, litter and other gross pollutants. The levels of many of these pollutants in runoff and groundwater are generally low, but the limited capacity of the wetlands to assimilate these pollutants is quickly exceeded.

Prior to European settlement the nutrient levels in the Park's wetlands would have been very low. The dark-coloured waters of most wetlands would have supported very low levels of phytoplankton activity and much of the wetland primary production would have been associated with the fringing wetland vegetation communities. However, the wetlands are now susceptible to eutrophication, where the build up of nitrogen and phosphorous may lead to blooms of blue-green algae. This can poison wildlife and support nuisance populations of midges.

Given their location in an urban setting, likely sources of pollutants to wetlands in the Park are garden fertilisers, herbicides and pesticides. Provision of community information regarding appropriate fertiliser, herbicide and pesticide use within catchment areas of the wetlands will help to reduce the nutrient inputs into the wetland system.

Reducing the inflow of pollutants to wetlands is a difficult management issue because the pollutants may originate from a range of sources within the catchment, and this requires an integrated approach by land managers, including community education. Gross pollutant traps on local authority drains help to reduce some pollutants entering the stormwater system. Retention basins may be an option on local authority drains where significant nutrients are carried via sediments.

Should an algal bloom occur, DEC and the Department of Health are to be notified. Tests will be undertaken to indicate if the bloom is toxic and appropriate management action will be undertaken, such as the installation of warning signs to advise of the risk and that contact with the algae should be avoided.

Hydrological changes

The hydrology of the Rockingham area has been changed by European settlement and has altered the wetland ecosystems in the Park, although the exact nature of these changes is largely unknown.

Significant areas of Rockingham were cleared in the mid-1800s for the timber industry and to make way for grazing and market gardening. Deep-rooted perennial natives that tapped into groundwater deep below the surface were replaced with shallow-rooted annual pasture species, which use less water. This likely caused an increase in groundwater levels. In addition, a continual increase in impermeable surfaces such as roads and buildings has lead to increased runoff and subsequent recharge to the groundwater.

Conversely, as groundwater is commonly used for irrigation of domestic gardens and public areas in Rockingham, there is a risk of over-abstraction and a resultant decline in groundwater levels. At the same time, the climate has become drier over the past 25 years. This also has implications for the wetland ecosystems of the Park, which are surface expressions of the groundwater.

Changes to the hydrological cycle linked to groundwater or surface runoff can influence wetland flora and fauna. The germination, survival and composition of aquatic and riparian vegetation communities may be jeopardised by a change in water level or alteration to seasonal drying and inundation. Changes to water levels may also affect the chemical conditions in the wetland. These changes may in turn threaten the wildlife species that inhabit the wetland. Loss of some aquatic and riparian vegetation, which may filter and trap pollutants, can subsequently lead to an influx of nutrients.

The threatened ecological community of sedgelands in Holocene dune swales supported by the Becher Point Wetlands is sensitive to even minor fluctuations in the hydrological regime because the wetlands are intermittent surface expressions of the groundwater (English, *et al.*, 2002) (Section 19).

Lake Richmond is also particularly susceptible to changes in water levels because of the three drains that flow into it. The flow of water into Lake Richmond is compensated by outflow through the Rockingham Main Drain. There is a need to ensure that water level changes (either increases or decreases) in the lake do not affect the threatened ecological community of thrombolites, as water level and quality are important determinants for the survival of the thrombolites. This is addressed in the Interim Recovery Plan (Section 19).

Anecdotally, the water levels in Lakes Cooloongup and Walyungup have been observed to be declining over recent years, with associated changes in the position and composition of riparian vegetation. The cause of this is unknown, but most likely due to drier climatic conditions.

Salinisation

There is a salt water interface between the ocean and groundwater, which extends approximately 150 metres inland to the base of the Safety Bay aquifer. The lower portion of the Rockingham aquifer also contains salt water. The abstraction of groundwater could lead to an inland movement of the salt water interface and intrusion of salt water into fresh water. This has occurred at Cape Peron, where some domestic bores draw salty water (Woods, 1988; Coastwise, 2001). A similar risk exists in the Port Kennedy-Lark Hill areas, where groundwater allocations are becoming increasingly committed.

Salinisation can affect wetland ecosystems adversely, as the indigenous flora and fauna may not be able to tolerate the change in conditions.

Impacts of surrounding developments
Urban development surrounding the Park may cause physical disturbance to wetlands. Drainage, excavation and filling works (including de-watering activities) either during or post- construction need to be managed. This can be achieved by ensuring that appropriate conditions are placed on planning and environmental approvals.

There is a need for integrated catchment management to help manage and mitigate the effects of pollution, hydrological change, salinisation and surrounding land uses on wetlands in the Park. Monitoring of wetland water quality and levels, as well as monitoring of the catchments, is required for informed management.

Strategies

1. **Encourage the City of Rockingham to prepare and implement integrated catchment management plans for water catchments affecting the Park, and promote best practice in relation to water-sensitive urban design, drainage and irrigation management. (DEC) [High]**

2. **Liaise with agencies and organisations undertaking water monitoring in the Park and use the data when making decisions regarding the management of the Park. (DEC, CoR) [Ongoing]**

3. **Develop and implement a monitoring programme for Lake Richmond that considers ecological water requirements (e.g. water levels and quality) consistent with the Interim Recovery Plan for the threatened ecological community of thrombolites. (DEC, CoR) [High]**

4. **Adopt best-management practices throughout the Park that do not add to nutrients and pollutants in the wetland systems, e.g. planting, fertiliser and irrigation management practices based on minimal nutrient loss and irrigation run-off in accordance with nutrient and irrigation management plans. (DEC, CoR) [Ongoing]**

5. **Protect and re-establish reedbeds and fringing vegetation in disturbed areas as nutrient traps as well as wildlife habitat. (DEC, CoR) [Ongoing]**

6. **Liaise with Water Corporation and any relevant State agency to investigate options to prevent significant pollutant inflow to Lake Richmond. (CoR, DEC) [Medium]**

7. **Liaise with DoP to discourage land-use practices that contribute nutrients and other pollutants into the wetland system, and encourage and facilitate the relocation of inappropriate land uses to more suitable locations. (CoR, DEC) [Ongoing]**

8. **Liaise with DoP to ensure that appropriate conditions are placed on subdivision and development approvals in or adjoining the Park to prevent adverse impacts on wetlands in the Park. (CoR, DEC, DoW) [Ongoing]**

9. **Ensure that obligations under the EPBC Act 1999 are met where activities are proposed that have, will have or are likely to have significant impact on matters of national environmental significance. (CoR, DEC) [Ongoing]**

10. **Provide educational and interpretive materials to the community to increase understanding of:**
    - **the effects of pollution on the wetlands; and**
    - **appropriate use of fertilisers and irrigation. (DEC, CoR) [Ongoing]**

18. Flora and Vegetation

The objective is to protect, conserve and rehabilitate local flora species and vegetation communities in the Park.

Vegetation in some areas of the Park has been disturbed but other areas have remained intact as representatives of remnant vegetation communities. These remnants, which are present from the coast through to coastal plain wetlands, are important for their conservation values and for interpreting the sequence of vegetation that would once have been present over much of the southern Perth metropolitan area.

There is no record of declared rare flora in the Park, however a number of taxa are considered to have special significance as they are uncommon or at the limits of the species' range.

FLORISTIC COMMUNITIES

A number of floristic community types have been defined for the Swan Coastal Plain bioregion. These floristic community types are based on analysis of detailed floristic data from a large number of quadrats located throughout the region (Gibson *et al.*, 1994 and subsequent work undertaken as part of *Bush Forever,* (Government

of Western Australia, 2000)). Table 2 shows the floristic community types in the Park.

Landforms, geology, soil age and type and proximity to the coast are all contributing factors that influence floristic community types (Gibson *et al.*, 1994).

For the purposes of this discussion, vegetation in the Park will be considered as seasonal wetland communities, upland communities and upland communities centred on Quindalup Dunes. The distribution of these vegetation types is illustrated in Figure 6.

Table 2 - Floristic Community Types at Rockingham Lakes Regional Park

Seasonal wetlands	
17	*Melaleuca rhaphiophylla* seasonal wetlands
19a	Sedgelands in Holocene dune swales
19b	Woodlands over sedgelands in Holocene dune swales
Upland communities	
21a	Central *Banksia attenuata - Eucalyptus marginata* woodlands
24	Northern Spearwood shrubs and woodlands
25	Southern *Eucalyptus gomphocephala – Agonis flexuosa* woodlands
Upland communities centred on Quindalup Dunes	
29a	Coastal shrubs on shallow sands
29b	Acacia shrublands on taller dunes
S13	Northern *Olearia axillaris – Scaevola crassifolia* shrublands
S14	*Spinifex longifolius* grassland and low shrubland

Source: Adapted from Government of Western Australia, 2000.

Seasonal Wetland Communities

Most of the wetland vegetation in the Park is classified as floristic community types 17, 19a and 19b. These types occur around Lake Richmond, Lake Cooloongup, Lake Walyungup, Tamworth Hill Swamp, Anstey and Paganoni Swamps and the Becher Point Wetlands at Port Kennedy.

Common species of community type 17 are swamp paperbarks (*Melaleuca rhaphiophylla*), coast saw-sedge (*Gahnia trifida*), *Lobelia alata*, bare twig-rush (*Baumea juncea*), *Lepidosperma longitudinale*, and common sowthistle (*Sonchus oleraceus*) (Gibson *et al.*, 1994).

Community types 19a and 19b are together described as the critically endangered 'sedgelands in Holocene dune swales' threatened ecological community. Typical and common native species in these communities are the shrubs climbing lignum (*Muehlenbeckia adpressa*), golden wreath wattle (*Acacia saligna*) and balga (*Xanthorrhoea preissii*) and herbs bare twig-rush (*Baumea juncea*), knotted club-rush (*Isolepis nodosa*), and *Poa porphyroclados* (Gibson *et al.*, 1994). Given their significant status, these communities are discussed in more detail in Section 19.

Upland Communities

Upland plant communities are represented by floristic community types 21a, 24 and 25.

Woodlands dominated by slender banksia (*Banksia attenuata*) and jarrah (*Eucalyptus marginata*) are found at Paganoni Swamp. Native wisteria (*Hardenbergia comptoniana*), *Melaleuca acerosa*, *Phyllanthus calycinus* and balga (*Xanthorrhoea preissii*) are common around Lakes Cooloongup and Walyungup, Lark Hill and Paganoni Swamp.

Tall, open tuart (*Eucalyptus gomphocephala*) forests are also common to the surrounds of Lakes Cooloongup and Walyungup, Tamworth Hill, Anstey and Paganoni Swamps. Some soils support understorey species such as slender banksia (*Banksia attenuata*) under the tuart. An overstorey of swamp banksia (*Banksia littoralis*) occurs at Lake Walyungup.

A flora survey undertaken by local volunteers associated with the Men of the Trees identified a number of previously unsurveyed species at Lake Cooloongup, including *Sollya heterophylla*, *Hakea varia*, *Hakea trifurcata*, *Ptilotus drummondii*, *Pimelea calcicola*, *Lobelia tenuior*, *Viminaria juncea* and *Anthropodium strictum*.

Upland Communities centred on Quindalup Dunes

Foredune alliances of heath and shrublands on Quindalup dunes are represented by floristic community types 29a, 29b, S13 and S14. Surveys conducted by Goodale *et al*. (1998) and Bowman Bishaw Gorham (1994) indicate that common species found in predominantly coastal communities in the Park include *Acanthocarpus preissii, Spinifex longifolius,* coast daisy bush (*Olearia axillaris), Scaevola crassifolia, Jacksonia furcellata,* golden wreath wattle (*Acacia saligna*), *Acacia cochlearis, Acacia lasiocarpa*; *Acacia rostellifera*; *Melaleuca systena;* chenille honeymyrtle *(Melaleuca huegelii*), balga (X*anthorrhoea preissii*), two leaf hakea (*Hakea trifurcata*) and one-sided bottlebrush (*Calothamnus quadrifidus*). Understorey species include knotted clubrush (*Isolepis nodosa*), *Lepidosperma longitudinale* and grey cotton heads (*Conostylis candicans*).

Species common to wind-exposed dune environments around Lake Richmond include coast daisy bush (*Olearia axillaris)*, berry saltbush (*Rhagodia baccata*), spyridium (*Spyridium globulosum*) and prickle lily (*Acanthocarpus preissii)* (Goodale *et al.,* 1998).

A vegetation transect within Port Kennedy Scientific Park undertaken as part of the SWALE project was identified as having the most undescribed taxa in comparison to other coastal transects at Geraldton, Bunbury and Esperance (Tauss, 2002). It also had a relatively low rate of weeds and numerous taxa that did not occur elsewhere in the reference transects. The latter is probably due to the presence of freshwater wetlands habitats within the transect which were not present in any of the other

transects (Tauss, 2002). A Priority 4 species, *Conostylis pauciflora* subsp. *pauciflora*, was found in Port Kennedy Scientific Park during the SWALE transect surveys (Tauss, 2002). A number of flora taxa previously not recorded in the Port Kennedy area, including two previously undescribed *Calandrinia* species, were collected by the SWALE project. These are listed below (Tauss, 2002):

- *Calandrinia* sp. 1 Becher. F Littleton 66;
- *Calandrinia* sp. 2 Becher. F.Littleton 68;
- *Conostylis pauciflora* subsp*. pauciflora* P4;
- *Hydrocotyle tetragonocarpa;*
- *Lepidosperma squamatum;*
- *Rhodanthe citrine;*
- *Sarcocornia quinqueflora* subsp*. quinqueflora;*
- *Scaevola anchusifolia;*
- *Suaeda australis;*
- *Threlkeldia diffusa;*
- *Triglochin mucronata.*

THREATS TO FLORA AND VEGETATION

The main threats to the flora and vegetation of the Park are:

- altered hydrology (Section 17);
- weeds (Section 21);
- wildfire (Section 22);
- plant diseases;
- insect borers; and
- urban interface issues and uncontrolled access by vehicles and pedestrians.

Plant Diseases

Honey fungus *(Armillaria luteobubalina)* occurs on coastal vegetation in the Quindalup and Spearwood Dune Systems and is one of the main diseases threatening vegetation structure and communities within the Park. Up to 40% of coastal plant species are susceptible to honey fungus, including many of the dominant small trees and shrubs. Honey fungus affects both the structure and composition of coastal dune vegetation by denuding large areas (Shearer *et al.,* 1998).

Honey fungus is present at Cape Peron and Lake Richmond. There is also a possibility that honey fungus could occur and affect vegetation in Port Kennedy Scientific Park and various inland sections of the Park.

Although honey fungus occurs naturally in the south-west of Western Australia, its normally slow rate of spread by direct root contact may be exacerbated by the movement of infected root material associated with construction works or rehabilitation. The characteristic fruiting bodies generally grow in clumps on tree bases, stumps or roots, and appear in June and July each year. There are no known controls for the disease.

In comparison to honey fungus, dieback (*Phythopthora cinnamomi*) is generally not found in the Quindalup Dune System on the coastal plain. A dieback survey has however indicated its presence at Paganoni Swamp. Management strategies are being implemented to prevent its spread.

Insect borers

The native tuart longicorn beetle (*Phoracantha impavida)* is a natural part of the tuart ecosystem. This borer lays eggs in the upper branches of the tuart and the larvae eat the cambium layer beneath the bark and thus ring-bark the branches leading to death of the limb. The tree can usually repair some damage by shooting from lower down, and by exuding sap, which engulfs the young larvae. Whilst a small level of insect attack is normal, repeated attack may ultimately cause the tree's death. Tuarts are more susceptible to borer attack when they are stressed.

This beetle has become an increasing threat over the last few years; the primary cause is likely to be a combination of environmental changes, including climate and fire frequency. Further research is required to understand this phenomenon and to determine appropriate control mechanisms.

Urban interface issues and uncontrolled access

Maintaining the integrity of bushland habitats in urban areas raises many issues such as weed invasion, arson, uncontrolled access, and rubbish-dumping. These issues are addressed in Sections 21, 22, 35 and 41 respectively.

All native flora is protected by the *Wildlife Conservation Act 1950* and the *Environmental Protection Act 1986 - Environmental Protection (Clearing of Native Vegetation) Regulations 2004.* Incidences of wilful damage to vegetation in the Park will be investigated and appropriate action taken by DEC.

Strategies

1. **Continue to implement the *Rockingham Lakes Regional Park Weed Species and Rehabilitation Plan*. Special emphasis is to be placed on the threatened ecological communities in the Park. (DEC, CoR) [High]**

2. **Use local species for landscape and amenity plantings. If non-local species are required, they should not include invasive species. (DEC, CoR) [Ongoing]**

3. **Reduce the risk of introducing and spreading plant diseases in the Park by limiting access to infected and susceptible areas and by ensuring appropriate hygiene standards for vehicles and machinery entering the Park. Soil introduced to and being moved around the Park is to be free of disease. (DEC, CoR) [Ongoing]**

4. **Encourage research into the wood-boring beetle *Phoracantha impavida* and encourage research to understand and manage the processes behind tuart decline. (DEC, Tuart Response Group) [Medium]**

5. **Reduce the impact of wildfire, utilising strategies set out in Section 22. (DEC, CoR) [Ongoing]**

6. **Provide information and interpretive material to the public that:**
   - **promotes an understanding and appreciation of the Park's flora and vegetation; and**
   - **encourages the planting of local species in areas surrounding the Park (Section 45). (DEC, CoR) [Ongoing]**

7. **Investigate any wilful damage to vegetation in the Park and take appropriate action. (DEC, CoR) [Ongoing]**

8. **Encourage the participation of volunteers, educational institutions and other organisations in research projects within the Park. (DEC, CoR) [Medium]**

9. **Undertake biological surveys on fungi to use as baseline information for monitoring changes in environment. Include information on fungi in relevant interpretive material. (DEC) [Medium]**

Key performance indicators for flora and vegetation
The success of the strategies will be measured by: 1. Changes in the abundance of selected flora species. 2. Existence of a weed control and rehabilitation plan.
Target: 1. No decline in the abundance of selected flora species from 2006 levels. 2. Implementation of the weed control and rehabilitation plan.
Reporting: 1. Every 5 years. 2. Every 5 years.

(Note: monitoring needs to take into account natural variability.)

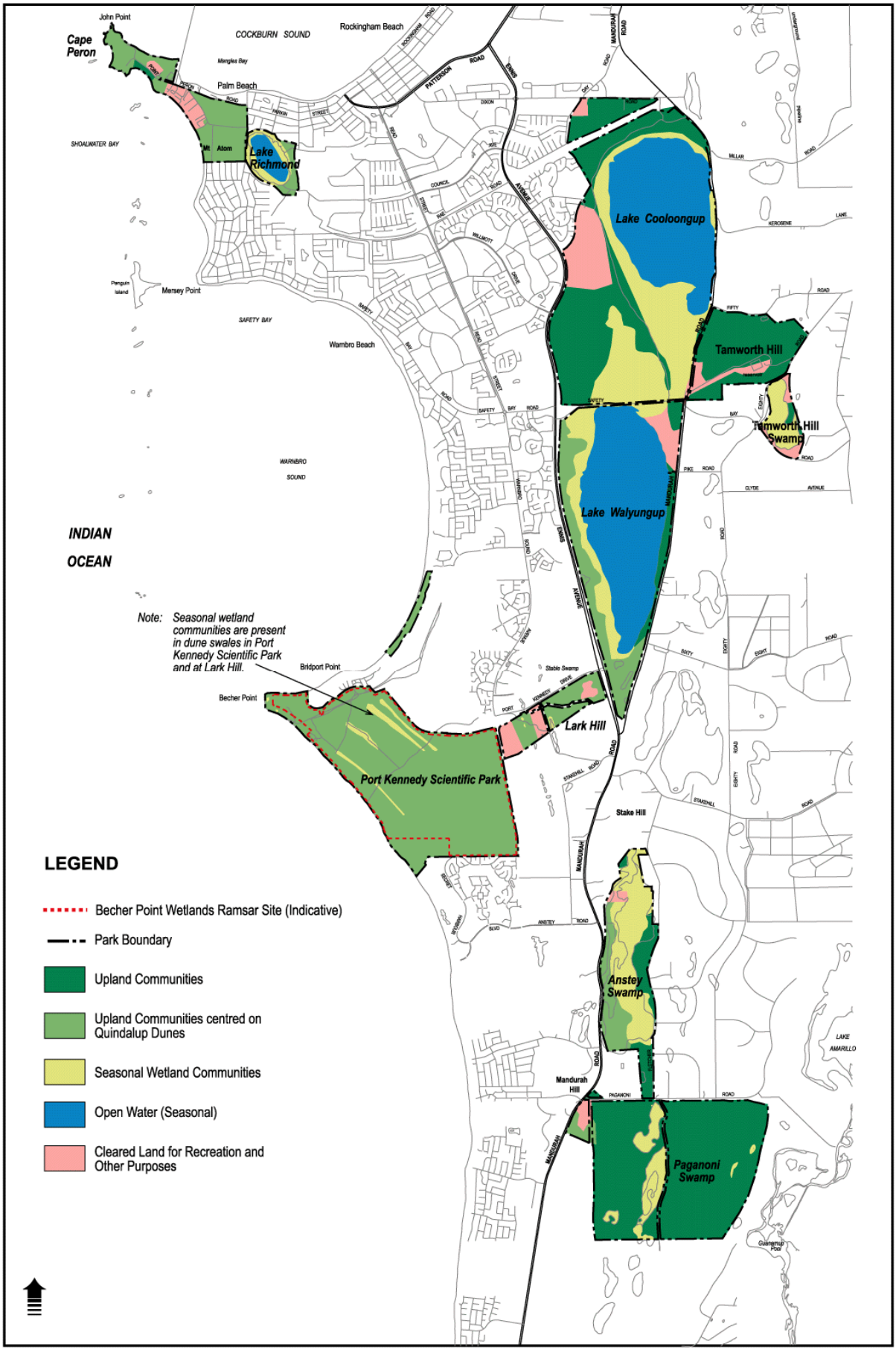

Figure 6 - Indicative Vegetation Distribution

19. Threatened Ecological Communities

The objective is to protect and enhance the threatened ecological communities within the Park.

There are two threatened ecological communities recorded in the Park (see Glossary). Both of these communities are listed as 'critically endangered' in Western Australia. This means that each community has limited distribution and is facing severe modification or destruction throughout its range. The two threatened ecological communities are also listed as 'endangered' under the Commonwealth EPBC Act 1999 and so receive additional recognition and protection. Any activities that have, will have or are likely to have significant impact on these communities will require assessment and approval under this Act.

SEDGELANDS IN HOLOCENE DUNE SWALES

There are two components to the Holocene dune swales community: sedgelands in Holocene dune swales, and woodlands over sedgelands in Holocene dune swales (Government of Western Australia, 2000). The present known distribution of the communities is almost entirely within linear wetland depressions (swales) occurring between parallel sand ridges of the Rockingham - Becher Plain. Most of the occurrences of sedgelands in Holocene dunes do not have an overstorey of trees. Within the Park, sedgeland communities occur in Port Kennedy Scientific Park and in the north-west corner of Lake Walyungup. Woodlands over sedgeland communities occur around Lakes Cooloongup and Walyungup.

The Holocene dune swales community is significant not only because of its endangered status, but because it provides a unique record of wetland evolution and associated floral assemblages. There are examples of damplands and sumplands that formed 7,000 years ago, through to those that have been formed in the last 100 years (English, *et al.*, 2002).

The primary determinant influencing the distribution, composition and characteristics of the sedgelands is water regime. The age of the wetland and proximity to the water table are related factors. It is unknown to what extent fire has influenced the present structure or composition of the community.

The actual assemblage of species varies between occurrences of the communities. Typical and common native species in the community are the shrubs *Muehlenbeckia adpressa, Acacia saligna* and *Xanthorrhoea preissii* and the herbs *Baumea juncea, Isolepis nodosa,* and *Poa porphyroclados* (Gibson *et al.*, 1994). Several weed species are found in this community but generally at low cover levels.

Processes that have or may threaten the communities include:

- clearing of vegetation;
- hydrological changes;
- changes to groundwater quality;
- inappropriate fire regimes;
- increased weed invasion;
- grazing by rabbits;
- erosion of coastal dunes; and
- disturbance by recreational use.

DEC coordinates the development and implementation of recovery strategies that aim to address high impact pressures and threats to threatened communities such as sedgelands in Holocene dune swales. An Interim Recovery Plan, which addresses the above threatening processes, has been developed for sedgelands in Holocene dune swales. The plan considers occurrences of the sedgelands outside of the Park.

THROMBOLITES IN LAKE RICHMOND

Thrombolites are basic microbial structures which, along with stromatolites, represent the oldest living organisms on earth. Thrombolites increased in abundance about 570 million years ago, whereas stromatolites were most abundant between two billion and 600 million years ago. Thrombolites and stromatolites are organo-sedimentary structures which are produced by the growth and metabolic activity of bottom-dwelling (or benthic) communities. They have similar external forms and sizes, although thrombolites have a clotted internal framework while stromatolites have laminated internal structures (Bowman Bishaw Gorham, 1999). Lake Richmond is one of the few places in the world where thrombolites are found.

The thrombolites of Lake Richmond are formed by complex associations of different types of bacteria and microalgae. They occur in an area about 15 metres wide in a rim around much of the lake. Sunlight and fresh water rich in calcium, bicarbonate and carbonate are likely to be essential to the growth and survival of the thrombolites. The source of calcium in the waters of Lake Richmond is probably groundwater that has passed through sand dunes that surround the lake (English, *et al.*, 2003).

Other microbialite structures have been cited in Lakes Cooloongup and Walyungup, however these structures are believed to be no longer living (English, *et al.*, 2003). Scientific study of these structures should be undertaken to confirm their status as this may assist in understanding the history of the thrombolites in Lake Richmond.

The thrombolites have been subject to historical and ongoing disturbance and threatening processes including:

- physical crushing by visitors;
- nutrient enrichment;
- alterations to groundwater throughflow or an increase in runoff, creating a reduction or increase in lake water levels, changes to lake hydrology or salt water intrusion;
- alterations to surrounding vegetation;
- smothering by weeds or sediment;
- dumping of rubbish; and
- the risk of physical disturbance from development near the lake.

DEC coordinates the development and implementation of recovery strategies that aim to address the threats to communities such as the thrombolites, including those that occur outside the Park. An Interim Recovery Plan has been developed for the thrombolites at Lake Richmond.

The thrombolites occur in a reserve vested in the City of Rockingham and managed by Naragebup Rockingham Regional Environment Centre. Close cooperation between the City, the Environment Centre and DEC is required for the protection of the thrombolites.

Strategies

1. **Implement the Interim Recovery Plans for the threatened ecological communities in the Park. (DEC) [High]**

2. **Confirm whether the microbialite structures at Lakes Cooloongup and Walyungup are living. (DEC) [High]**

Key performance indicators for threatened ecological communities
The success of the strategies will be measured by: 1. Changes in the condition of the threatened ecological communities.
Target: 1. No decline in the condition of the threatened ecological communities.
Reporting: 1. Every 5 years.

(Note: monitoring needs to take into account natural variability.)

20. Fauna

The objective is to protect and conserve naturally-occurring fauna species in the Park, particularly threatened and priority species.

This section provides information on the known fauna of the area and discusses the likelihood of the presence of other species. Research indicates that the Park consists of a diverse array of habitats that support and cater for local and migratory birds as well as terrestrial fauna (Tingay and Associates, 1996). Given the conservation value of the Park, it is essential that habitat areas are protected, enhanced and conserved.

Birds

The Park is an important refuge for birds (Tingay and Associates, 1996). The wetlands in the Park provide valuable habitat areas, especially Lake Richmond, which retains water throughout the summer months. Lakes Richmond, Cooloongup and Walyungup are habitats known to support bird species listed for protection under a number of international migratory bird agreements. Trans-equatorial migratory birds covered by these agreements are also protected under the Commonwealth EPBC Act 1999. Any activities that have, will have or are likely to have significant impact on these species will require approval under the EPBC Act 1999.

A survey by Goodale *et al.* (1998) identified over 100 bird species around Lake Richmond. A number of species are trans-equatorial migratory birds that fly between Western Australia and Siberia. Other species at the lake include but are not limited to musk duck (*Biziura lobata*), Pacific black duck (*Anas superciliosus*), black swans (*Cygnus atratus*), Australasian coot (*Fulicca atra*) and reed warbler (*Acrocephalus stentores*).

The habitats at Lakes Cooloongup and Walyungup support a number of species including *w*hite-faced heron *(Ardea novaehollandiae*), sacred ibis (*Threskiornis aethiopicus*), grey teal (*Anas gibberifrons*) and greater sand plover (*Charadrius leschenaultii*). Trans-equatorial migratory waders using the lake include red-necked stint (*Calidris ruficollis*), curlew sandpiper (*Calidris ferruginea*) from Siberia and common sandpiper (*Tringa hypoleucos*) from Eurasia (Tingay and Associates, 1996). These species are protected under international agreements.

Anstey and Paganoni Swamps provide different habitats which are preferred by a range of waterbirds. The presence of birds less common in other wetlands in the area has been recorded at the two swamp areas, such as Australasian bittern (*Botaurus poiciloptilus)* and little bittern (*Ixobrychus minutus)* (Tingay and Associates, 1996). Swamp harrier (*Circus approximans*), egret *(Egretta* sp.), white-faced heron (*Ardea novaehollandiae*), Australian white ibis (*Threskiornis molucca*) and cormorant (*Phalacrocorax* species) use Anstey and Paganoni Swamps for nesting (Tingay and Associates, 1996).

Birds of prey in the Rockingham area include the osprey (*Pandion hallaetus*) and peregrine falcon (*Falco peregrinus*). Carnaby's black cockatoo (*Calyptorhynchus latirostris*) are also found in the area.

Peregrine falcon, Australasian bittern and Carnaby's black cockatoo are specially protected under the *Wildlife Conservation Act 1950* (see Glossary). Little bittern are classified as Priority 4 Fauna (see Appendix D - Glossary). Carnaby's black cockatoo are also listed as threatened under the EPBC Act 1999.

Mammals

The open tuart and marri-jarrah-tuart forests at Lake Cooloongup and Tamworth Hill Swamp are likely to support the western grey kangaroo (*Macropus fuliginosus*) and black-gloved wallaby (*Macropus irma*). In 1992 and 1994, studies at the Port Kennedy area inferred that wallaroo (*Macropus robustus*), echidna (*Tachyglossus aculeatus*), bush rat (*Rattus fuscripes)* and dunnart (*Smithopsis* sp.) species were present (Bowman Bishaw Gorham, 1994). The quenda (*Isoodon obesulus fusciventer*) is also present within the Park (Tingay and Associates, 1996; Bowman Bishaw Gorham, 1994).

Quenda have been classified as Priority 5 Fauna (see Appendix D - Glossary).

Amphibians and Reptiles
Amphibians found around the wetlands include sand plain frog (*Crinia insignifera*), moaning frog (*Helioporus eyrei*), Glauert's frog (*Crinia glauerti*), marbled burrowing frog (*Helioporus psammophilus*), western banjo frog (*Limnodynastes dorsalis*), slender tree frog (*Litoria adelaidensis*) and western tree frog or motorbike frog (*Limnodynastes moorei*) (Bowman Bishaw Gorham, 1997).

The long-necked tortoise (*Chelodina oblonga*) may be present in Lakes Richmond, Cooloongup and Walyungup (Tingay and Associates, 1996).

The Perth lined lerista lizard (*Lerista lineata*) and the black-striped snake (*Neelaps calonotus*)) are also found in the region of Port Kennedy Scientific Park. Urbanisation is increasing pressure on the habitats of these species (DEC, undated).

Carpet python (*Morelia spilota imbricata*), western tiger snake (*Notechis scutatus*), dugite (*Pseudonaja affinis*), Gould's monitor (*Varanus gouldii*), racehorse monitor (*Varanus tristis*), bobtail (*Tiliqua rugosa rugosa*) and various skinks, including fence skink (*Pogona minor*) have been recorded in the Park (Goodale *et al.*, 1998). The carpet python is specially protected in Western Australia under the *Wildlife Conservation Act 1950*.

It is acknowledged that the presence of venomous snakes such as the western tiger snake may be a concern to some Park visitors and local residents. It is proposed to provide contact details within the Park for wildlife carers and organisations that relocate dangerous or injured fauna.

Fish
Three fish species were identified at Lake Richmond during a survey in 1998, namely the native goby *Psuedogobius* sp., the exotic freshwater species *Gambusia holbrooki* and the sea mullet (*Mugil dobula*) (Goodale *et al*, 1998). *Gambusia holbrooki* is an aggressive fish introduced to Australia from Central America to control mosquitos. It may have contributed to the demise of native fish, amphibians and aquatic invertebrates in the lake. The sea mullet is thought to enter the lake through the Rockingham Main Drain outlet.

Further work by Hoddell described *Psuedogobius olorum* at Lake Richmond, which is common to local estuaries and rivers (Hoddell, 2003). This species also inhabits Lake Walyungup. Lake Walyungup also supports the goby *Afurcagobius suppositus* and *Leptatherina wallacei* (Hoddell, 2003). The latter may be genetically distinct from populations in nearby estuaries (Hoddell, 2003).

Hoddell (2003) indicated that *Leptatherina wallacei* does not appear to inhabit Lake Cooloongup, although it was reported here by Seddon (1972).

Invertebrates
Aquatic and terrestrial invertebrates represent a significant and important component of the wetland food web and are the major food sources for many species of waterbirds.

A survey of Lake Richmond (Goodale *et al.*, 1998) collected a total of 20 taxa of invertebrates. They are typical of species collected in wetlands on the Swan Coastal Plain. One species of the genus *Helisoma* is thought to be an introduced species. Other wetlands within the Park also support an array of invertebrate species. Koonacs (*Cherax quinquecarinatus*) have been reported in Lake Cooloongup (Tingay and Associates, 1996).

Coastal areas in the Park are likely to be breeding sites for the colourful yellow admiral butterfly (*Vanessa itea*) (Powell, *pers. comm.,* 2003).

Mosquitos and Midges
Wetlands in urban areas often require a management response to mosquito or midge populations. Reductions in invertebrate species diversity, changes in the presence or absence of particular groups of organisms, and nuisance levels of particular species has been shown to reflect a deterioration of the overall wetland environmental quality. Significant numbers of mosquitos or midges may cause a nuisance to nearby residents, and mosquitos may also become a public health risk because some species can transmit diseases. Management of mosquito populations is the responsibility of the City of Rockingham.

In past years, there have been some seasonal problems with mosquitos, however these have been short lived. Mosquitos and midges are generally not a problem within the Park and the City of Rockingham does not receive regular complaints. The City of Rockingham sets traps at Anstey and Paganoni Swamps at various times. Mosquitos and midges caught are, on average, significantly below nuisance or large population numbers, however, this may become a more prominant issue as urban development occurs around the Park.

THREATS TO FAUNA

The main threats to fauna within the Park are:

- loss of habitat from plant diseases (Section 18);
- the invasion of weeds (Section 21);
- the loss and fragmentation of habitat that could result from wildfire (Section 22);
- competition and predation by introduced animals and pets (Section 23);
- the loss of native habitat surrounding the Park (Section 26);
- artificial feeding of native animals, particularly waterbirds; and
- death or injury of native animals on transport corridors within and adjoining the Park.

Given these threats, fauna populations in the Park have declined and it is likely they will continue to decline. In order to maintain the diversity of fauna species in the Park it may therefore be appropriate to reintroduce native wildlife into the Park.

Regional ecological linkages and corridors between the Park and adjoining areas of ecological significance are also important in helping to maintain the diversity and vigour of the Park's ecological systems (Section 26).

Artificial feeding of native animals
Artificial feeding of native animals can affect their health. Feeding of waterbirds can have localised effects on the nutrient input and water quality in a wetland system. Uneaten food and faeces can accumulate in areas where birds congregate, and enhance conditions for the development of botulism. Feeding of native animals will be discouraged.

Impact of transport corridors on animals
A number of roads with high traffic volumes adjoin sections of the Park, posing a threat to wildlife. Wildlife access tunnels have been constructed under Safety Bay Road and the Kwinana Freeway, adjacent to Paganoni Swamp, to facilitate wildlife crossing between habitat areas. Fencing of rail corridors and major roads adjoining the Park has reduced the risk to wildlife.

Strategies

1. **Continue management focus on habitat protection and enhancement as well as feral animal control to create improved conditions for native fauna. (DEC) [High]**

2. **Provide interpretive material that:**
   - **promotes an understanding and appreciation of the Park's fauna;**
   - **discourages the artificial feeding of birds;**
   - **supports volunteer groups involved with the Park; and**
   - **informs the public about the adverse impacts of feral animals and domestic pets on native fauna in the Park (Section 45).**

   (DEC, CoR) [High]

3. **Provide contact details in the Park of wildlife carers for the removal of injured fauna from the Park as well as organisations that relocate dangerous fauna from places where they may constitute a significant risk to people. (DEC) [Medium]**

4. **Ensure that recreational uses are consistent with the protection and management of fauna and fauna habitats. (DEC, CoR) [Ongoing]**

5. **Liaise with the proponent of the Kennedy Bay development and DoP to ensure the completion of the vermin-proof fence adjacent to Port Kennedy Drive at Port Kennedy. (DEC) [High]**

6. **Apply the 'Pest and Problem Animal Control Plan for Regional Parks'. (DEC) [High]**

7. **Consider the reintroduction of certain native wildlife into the Park pending successful management of introduced animals and pests and the availability of appropriate habitat. (DEC) [Low]**

8. **Promote research in the Park to assist in managing fauna. (DEC, CoR) [Ongoing]**

9. **Investigate any inappropriate interference or contact with fauna in the Park and take appropriate action. (DEC, CoR) [Ongoing]**

Key performance indicators for fauna
The success of these strategies will be measured by: 1. Changes in species diversity of naturally-occurring fauna. 2. Changes in the abundance of selected naturally-occurring fauna species.
Target: 1. No decline in species diversity of naturally-occurring fauna. 2. No decline in the abundance of selected naturally-occurring species.
Reporting: 1. Every 5 years. 2. Every 5 years.

(Note: monitoring needs to take into account natural variability.)

21. Weeds

The objective is to minimise the impact of environmental weeds on the local plant species and communities within the Park.

Environmental weeds have been defined as plants that establish in natural ecosystems (marine, aquatic, terrestrial) and proceed to modify natural processes, usually adversely, resulting in the decline of the communities they invade (Department of Conservation and Land

Management, 1999). Weeds may originate from intra-state, interstate, or overseas. Some weeds are declared under the *Agriculture and Related Resources Protection Act 1976*.

Many weeds, particularly grass species, grow quickly and have abundant seeds that spread widely. Weeds compete for space, nutrients, water and sunlight, which often leads to a decline in native species diversity within bushland. Weeds may also physically hinder plant regeneration and alter local nutrient recycling.

The invasion of weeds is a major threat to the conservation value of the Park and it is vital that measures be introduced to limit or control the degradation processes. There are many reasons for the presence of weeds in the Park including:

- land clearing;
- past land uses;
- soil disturbance from vehicle access;
- construction of paths and other facilities which allow weeds to establish;
- fires, which promote the growth of weeds;
- the dumping of garden refuse in the Park which introduces many plants that vigorously compete with local vegetation;
- invasive species from adjoining areas, road verges and gardens;
- transportation of weed seeds by animals or wind;
- grasses planted for amenity purposes in parkland settings invading bushland areas; and
- invasive weed species that have spread from lease and adjacent areas.

In Rockingham, strong coastal winds blowing across areas disturbed for urban development is thought to exacerbate weed spread.

Weeds that are of particular concern in the Park include Victorian tea tree (*Leptospermum laevigatum*), Japanese pepper (*Schinus terebinthifolia*), fig (*Ficus carica*), cottonbush (*Gomphocarpus fruticosus*), false caper (*Euphorbia terracina),* buffalo grass (*Stenotaphrum secondatum*), pampas grass (*Cortaderia selloana*), and kikuyu grass (*Pennisetum clanderia*), sharp rush (*Juncus acutus*) and tambookie grass (*Hyparrhenia hirta*). Pelargonium (*Pelargonium capitatum*), onion weed (*Trachryandra divaricata*), couch grass (*Cynodon dactylon*), stinkwort (*Dittrichia graveolens*) and bridal creeper (*Asparagus asparagoides*) are also present.

Bulrush control

Typha orientalis or bulrush is a weed that occurs at Lake Richmond and in the Becher Point Wetlands (Tingay and Associates, 1996). This species is an aggressive coloniser especially following disturbance, often to the detriment and exclusion of local reeds and sedges. *Typha orientalis* creates an increased risk of fire because it dries out in summer. If not controlled, *Typha orientalis* can also invade and block constructed drains causing maintenance problems.

Although *Typha orientalis* is a non-local species, it does perform a number of valuable functions. It provides shelter, nesting sites and is a food source for some birds and other wildlife. It also performs a nutrient stripping function, although its nutrient stripping capability is generally inferior to local species that grow in the same environment and are less seasonal in their growth cycle (Regeneration Technology, 2002).

The removal of *Typha orientalis* from the Park needs to be carefully considered, and is likely to be particularly important in the sedgelands in Holocene dunes swales community. The floral composition of these wetlands is significant and requires continual *Typha orientalis* control in conjunction with revegetation, in order to protect the natural diversity of species and other conservation values.

WEED MANAGEMENT

All methods of weed control (chemical, physical, or biological) need to be considered for their application in the Park. Ecological considerations place constraints on weed control, because off-target impacts such as those on native plants or habitat may rule out the use of some techniques. There are also financial constraints on the amount of weed control that can be carried out.

Guidance for weed management in the Park is provided by *Weeds on Conservation and Land Management Land Policy Statement No. 14* and the *Environmental Weed Strategy for Western Australia* (Department of Conservation and Land Management, 1999). More detailed planning has been undertaken in the form of the *Rockingham Lakes Regional Park Weed Species and Rehabilitation Plan* (Syrinx Environmental, 2006) which outlines an integrated and coordinated approach to weed management in the Park. This plan is consistent with the above policy and strategy.

The *Rockingham Lakes Regional Park Weed Species and Rehabilitation Plan* outlines the extent and abundance of priority weeds and the most effective methods for controlling priority weed species within the Park (Syrinx Environmental, 2006).

In determining weed control programmes, DEC will consider the following matters:

- recognition of weed potential (invasiveness, distribution and environmental impact);
- maintaining areas of the Park that have vegetation in good condition as a priority; and
- control of weeds that impact on significant species and threatened species and communities as a priority.

It is important to discuss weed control with leaseholders and park neighbours to enable a more regional effort of weed control to be implemented. The planting of non-local plant species within the Park should be discouraged and discussions may be needed with the City of Rockingham, leaseholders and other stakeholders

to ensure that species local to the area are planted in the Park and on road verges surrounding the Park.

Weed control can greatly benefit from community involvement. Community involvement in managing the Park is critical to the successful implementation of this Plan. The managing agencies have limited resources and weed control can be very labour-intensive. The managing agencies acknowledge the considerable efforts by the community in undertaking works to control weeds. Volunteer groups, such as those associated with the Naragebup Rockingham Regional Environment Centre, have successfully undertaken weed control projects within the Park for a significant time. Members of the community wanting to be involved in weed control programmes in the Park can do so by joining the community volunteer groups within the Park and participating in activities in the Park organised by the managing agencies.

Strategies

1. **Continue to implement the *Rockingham Lakes Regional Park Weed Species and Rehabilitation Plan*. The plan provides:**
   - **an assessment of bushland condition;**
   - **maps of weed distribution;**
   - **priorities according to invasiveness, distribution and environmental impact; and**
   - **revegetation strategies.**

   (DEC) [High]

2. **Consult with the Water Corporation, the City of Rockingham and any relevant State agency to ensure adequate weed control in drains that flow into the Park. (DEC) [Ongoing]**

3. **Where possible, coordinate works with adjacent land managers and any relevant State agency in undertaking weed control. (DEC, CoR) [Ongoing]**

4. **Set boundaries for grass areas used for recreation and control the spread of grasses outside these areas. (DEC, CoR) [High]**

5. **Use interpretive and educational material to inform Park visitors, lessees and park neighbours about the impacts of dumping weeds, rubbish and garden refuse in the Park. (DEC, CoR) [Medium]**

6. **Encourage and support volunteer community groups to become involved with weed control and rehabilitation projects in the Park. (DEC, CoR) [Ongoing]**

7. **Where non-local vegetation in the Park is considered to have cultural significance, retain it where appropriate, providing it is not invasive. (DEC, CoR)**

Key performance indicators for weeds
The success of these strategies will be measured by: 1. Changes in populations of high priority weeds as identified in the *Environmental Weeds Strategy for Western Australia*. 2. Changes in the abundance and distribution of priority environmental weeds, as identified in the Park's weed control and rehabilitation plan. 3. Existence of a weed control and rehabilitation plan.
Target: 1. No new populations of high priority weeds as identified in the *Environmental Weeds Strategy for Western Australia* over the next ten years. 2. No increase in the abundance and distribution of priority environmental weeds. 3. Completion and implementation of the weed control and rehabilitation plan.
Reporting: 1. Every 5 years. 2. Every 5 years. 3. Every 5 years.

22. Fire

The objective is to manage fire to protect and promote the conservation of biodiversity and natural values whilst also providing for the protection of human life and community assets.

Wildfire is a significant threat to the Park and the risk of wildfire needs to be managed. Wildfires can threaten biodiversity, human life, property and the cultural values of the Park. Increasing urbanisation and visitor use of the Park is likely to increase the incidence of unplanned fire. Restricting access to high risk areas can reduce the incidence of unplanned fire.

The Park is regularly affected by wildfire, and most are deliberately lit. Fires have significantly affected the vegetation type and composition in the Park, especially on the Becher Plain, for example fire activity encourages the invasion of *Typha orientalis* in wetland areas, which regenerates far quicker than native rushes. Fires in *Typha orientalis* are difficult to control and can cause damage to fringing

paperbark vegetation. In 1995, it was identified that approximately 50% of flora species present at Port Kennedy Scientific Park were either re-seeders or annuals, which are sensitive and vulnerable to frequent fires (Tingay and Associates, 1996).

FIRE MANAGEMENT

The responsibility for fire suppression is dependent on whether the fire is within or outside a gazetted fire district. The Gazetted Fire District covers Cape Peron, Lake Richmond, Port Kennedy Scientific Park and the north-west section of Lake Cooloongup. Fire suppression in these areas is the responsibility of the Fire and Emergency Services Authority (FESA) in liaison with the managing agency of the land. In other areas of the Park, the responsibility for fire suppression rests with City of Rockingham Bushfire Brigades, in liaison with the managing agency of the land.

Pre-suppression and post-suppression works in the Park are the relevant land managers' responsibilities. An important consideration in these works is the protection of environmentally sensitive areas, and measures should be initiated to prevent the spread of plant diseases and weeds.

When managing fire, DEC is guided by the *Bush Fires Act 1954,* and *Fire Management Policy Statement No. 19.*

A Fire Response Plan for the Park has been developed by DEC in conjunction with FESA and the City of Rockingham to help ensure effective response to wildfire by the responsible agencies. It outlines practices such as:

- protecting environmentally sensitive areas from wildfire;
- undertaking pre-suppression activities including reducing fuel loads by mowing or slashing large open grassed areas (mown or slashed areas should be delineated so that mowing practices do not adversely affect natural regeneration and fauna habitat);
- maintaining a fire record system of all fires in the Park including date and cause; and
- ensuring that an effective network of fire access tracks is maintained.

If selective prescribed burning is being considered for the Park, further consultation will occur with the Conservation Commission, the City of Rockingham and other stakeholders.

Strategies

1. **Implement and periodically update the Park's Fire Response Plan. (DEC, CoR) [High]**

2. **Coordinate rehabilitation works with fire prevention requirements. Fire management has been considered in the preparation of the *Rockingham Lakes Regional Park Weed Control and Rehabilitation Plan* (Section 24). (DEC, CoR) [High]**

3. **Initiate measures in pre-suppression works and post-suppression follow-up works to minimise the spread of plant diseases and weeds in the Park. (DEC, CoR) [High]**

4. **Ensure that recreation planning takes into account fire prevention requirements, for example when constructing or upgrading paths in the Park consider building them to a standard that will carry fire control vehicles, so that access is improved for fire management (Section 35). (DEC, CoR) [Ongoing]**

23. Pets and Problem Animals

The objective is to minimise the environmental and social impact of pets and problem animals in the Park.

PETS

The presence of domesticated animals in, or in close proximity to the Park may impact on the natural environment of the Park.

Domestic animals are not permitted in national parks, conservation parks and nature reserves. Provisions can be made to allow domestic animals in national parks and conservation parks in certain designated areas if they are on leads, under control and managed. Domestic animals are not permitted in nature reserves.

Cats

Domestic cats from nearby residences may hunt for birds, reptiles and other animals. Cat owners should be encouraged to keep cats at home, especially at night, and have them de-sexed to help control feral populations. The City of Rockingham provides an information pamphlet called 'Cats in the Community', which covers sterilisation, identification and confinement.

Research undertaken by Murdoch University has indicated that there is broad community support within suburban Perth for cat control measures such as compulsory sterilisation, registering of cats, restricting cats' ability to roam and stipulating a maximum number of cats per property (Grayson *et al.*, 2002).

The City of Stirling has introduced *The Keeping and Control of Cats Local Law (1999).* This Local Law enables Stirling City Council to declare:

- A Cat Prohibited Area by designating areas where cats are prohibited from entering or remaining; and
- A Fauna Protection Buffer Zone, which is land extending 200m from the boundary of a Cat Prohibited Area and includes all of the properties within that buffer zone. A person can not keep more than one cat on any premises in a Fauna Protection Buffer Zone except in accordance with a valid permit in relation to those premises.

The implementation of a similar Local Law within the municipality of Rockingham, is likely to have significant benefits to the native fauna residing and breeding within the Park and nearby areas.

Dogs

Dog walking is a common activity in the Park and a legitimate activity in certain areas, however appropriate restraint of dogs is necessary if they are not to have an adverse effect on wildlife and activities of other Park visitors.

The City of Rockingham is responsible for administering and enforcing the *Dog Act 1976* within its municipality. The Act states that 'a dog shall not be in a public place unless it is:

(a) held by a person who is capable of controlling the dog; or
(b) securely tethered for a temporary purpose;

by means of a chain, cord, leash or harness of sufficient strength and not exceeding the prescribed length.'

A dog is exempt from the above requirements if it is in an area specified by a local government as a Dog Exercise Area. Within a Dog Exercise Area, dogs are permitted off-leash so long as the owner is in reasonable proximity to the dog. The owner is also required to carry and be capable of attaching a leash for the purpose of controlling the dog. The City of Rockingham has designated gazetted Dog Exercise Areas under the provisions of the *Dog Act 1976*.

Local governments are also able to designate dog-prohibited areas under the *Dog Act 1976*.

Dogs are currently allowed off-lead in the gazetted Dog Exercise Areas at Cape Peron: bounded on the east by Hymus Street and extending around the coast generally in a westerly direction and then in a southerly direction and bounded on the south by Boundary Road. There is a demand and expectation for this use to continue.

Port Kennedy Scientific Park is a nature reserve and therefore dogs are prohibited. Dogs are also prohibited in the Park's wetlands. In the remaining areas of the Park managed by DEC, dogs will only be permitted on leads and under effective control at all times.

Horses

Agistment of horses is not considered appropriate in the Park. Horse riding is allowed in Anstey Swamp on designated tracks, however horse riding is not considered appropriate in the other areas of the Park. Horse riding is discussed in detail in Section 35.

PROBLEM ANIMALS

Problem animals are those species that have the potential to cause serious impact on natural systems through direct effects such as predation, habitat destruction, competition for food and territory, and introduction of disease, and through environmental degradation such as caused by over-grazing. Problem animals can be either native species that are impacting on natural values (for instance, from unsustainable populations) or introduced species that have become established as wild or naturalised populations.

Introduced animals such as feral cats, foxes, rabbits, deer, sheep, waterfowl, bees and others occur in the Park and all have detrimental effects on environment values. The control and removal of these animals will help protect the native fauna and flora of the Park.

Feral cats, dogs and foxes are known to attack native fauna.

Rabbits, deer and sheep reduce the survival rate of native seedlings by grazing, thereby denuding areas of vegetation. Deer and sheep have been a problem at Anstey Swamp and Paganoni Swamp, where they have escaped from surrounding rural properties.

Hybridisation and competition between domestic and native waterfowl is believed to interfere with native species. Introduced and hybridised waterfowl will therefore be removed.

Park users will be discouraged from feeding waterfowl and other birds through educational signs. Artificial feeding encourages greater numbers of birds than can be naturally supported. Uneaten food such as bread also increases nutrients (in already nutrient-rich lakes) and decaying bread can also allow botulism to spread in bird populations.

The introduced honeybee (*Apis mellifera)* is present in the Park and can have detrimental effects on native insects, hollow-using animals and vegetation. Competition between honeybees, native bees and other native pollinators for flora resources usually favours the more aggressive foraging of the introduced bee, resulting in a decline of native insects. Other possible consequences are inefficient pollination of some local plants, destruction of flowers and hybridisation of some native plant species by cross-pollination of different native species. Beekeeping is not considered appropriate in the Park, as discussed in Section 39.

With regard to the removal of pest and problem animals in the Park, the managing agencies will need to determine the extent and impacts of animals and then, where appropriate, implement control options. The *Pest and Problem Animal Control Plan for Perth's Regional Parks* (Department of Environment and Conservation, 2007) provides a guide in developing control options. In managing problem animals, DEC is directed by the proposed policy *Management of Pest Animals on DEC-Managed Lands* - (subject to final consultation).

The completion of the vermin-proof fence adjacent to Port Kennedy Drive at the Port Kennedy Scientific Park will assist with managing introduced animals in that area.

Strategies

1. **Use interpretive material to inform the community about the adverse effects of pets and introduced animals on native fauna. Include information explaining restrictions on pet access and encouraging responsible pet ownership in interpretive material (Section 45). (DEC, CoR) [High]**

2. **Liaise with the City of Rockingham regarding the potential introduction of a Local Law for controlling cats to improve protection of native fauna. (DEC) [High]**

3. **Allow dogs to be exercised off-lead at Cape Peron within the gazetted Dog Exercise Areas. (CoR, DEC) [Ongoing]**

4. **Exclude dogs and other pets from Port Kennedy Scientific Park and the wetland areas of the Park. In other areas, ensure that dogs are on a lead and under effective control at all times. (DEC, CoR) [Ongoing]**

5. **Liaise with the City of Rockingham to review Local Laws relating to dogs to ensure consistency with this Plan. (DEC) [Medium]**

6. **Consider providing dog excreta bags and bins at appropriate sites in the Park. (DEC, CoR) [Low]**

7. **Use the Regional Parks Pest Animal Control Plan as a guide to developing control options for managing pest and problem animals in the Park. (DEC) [High]**

8. **Remove hybrid and introduced avian fauna and introduced bees from the Park. (DEC, CoR) [High]**

24. Rehabilitation

The objective is to restore degraded areas of the Park to a condition resembling the natural environment.

Weeds, wildfires, the provision of roads, access ways, utilities and service corridors have resulted in modifications to vegetation communities, necessitating rehabilitation where possible. Rehabilitation is the establishment of a stable, self-regulating ecosystem following disturbance, consistent with the purpose for which the area is managed. Ongoing issues of pests, erosion, infertile soils and unconsolidated sand dunes make rehabilitation challenging in the Park.

Rehabilitation methods and techniques will vary according to the level of degradation that has occurred, the proposed use of an area and the type of vegetation community to be reinstated. It is difficult to restore severely degraded sites to a natural habitat, however considerable conservation gains can be made if a wide range of local overstorey species are used for revegetation.

The Park contains a number of areas that have been extensively degraded by past land uses and fire. Generally, the rehabilitation of areas of high conservation significance and areas fringing lakes and wetlands will be given a high priority. Fringing vegetation helps to create a more natural habitat as well as reduce nutrient inputs through filtration and storage.

Where possible, plant material used during rehabilitation should be sourced from within the boundaries of the Park or the nearest viable source, to maintain the genetic integrity of the area. This includes seeds, cuttings and brushing. Seed collection from within the Park will generally be permitted only for rehabilitation projects within, or directly impacting upon the Park. It is important that mulch and soil used in rehabilitation works does not contain unwanted weed seeds or plant disease.

The *Rockingham Lakes Regional Park Weed Species and Rehabilitation Plan* provides a guide for the long-term restoration of degraded areas within the Park and has been developed in accordance with *Rehabilitation of Disturbed Land, Policy Statement No. 10*. The plan identifies major disturbance sites within the Park, and priorities for their restoration to a condition resembling the natural environment. In general, areas that have the highest conservation significance are given priority in rehabilitation.

The managing agencies acknowledge the considerable effort by volunteers in completing rehabilitation works within the Park in the past. For instance, considerable rehabilitation work has been undertaken at Lake Richmond with thousands of seedlings being planted by the Naragebup Rockingham Regional Environment Centre.

Local residents, community groups and education institutions should be encouraged to be actively involved in rehabilitation works.

Strategies

1. **Continue to implement the *Rockingham Lakes Regional Park Weed Species and Rehabilitation Plan*. (DEC) [High]**

2. **Coordinate rehabilitation works between the land managers and relevant community groups. (DEC, CoR) [Ongoing]**

3. **Coordinate rehabilitation with weed control, fire protection and recreation facility and trail development at the planning, design and implementation stages. (DEC, CoR) [Ongoing]**

4. **Use locally collected seed, where possible, for propagating plants or for direct seeding. Where locally collected seed is not available, seed should be obtained from local provenance. (DEC, CoR) [Ongoing]**

5. **Encourage members of the local community and schools to participate in rehabilitation works and seek external funding to achieve these works where possible. (DEC, CoR) [Ongoing]**

6. **Ensure that mulch and soil used in rehabilitation works does not contain unwanted seeds or plant diseases. (DEC, CoR) [Ongoing]**

7. **Where appropriate, allow licensed seed collection from within the Park for rehabilitation projects within, or directly affecting the Park. (DEC, CoR) [Ongoing]**

25. Park Aesthetics and Landscape Amenity

The objective is to maintain and enhance the natural and cultural landscape qualities of the Park.

Management of landscape amenity is a key consideration in the overall management of the Park. The following guidelines provide a practical framework for managing the landscape value of the Park.

- Alterations to the natural landscape should be subtle, remaining subordinate to natural elements by borrowing extensively from line, form, colour, texture and scale found commonly in the surrounding landscape.
- Site-specific visual resource factors should be carefully identified and evaluated before any management activities are undertaken.
- Where appropriate, degraded landscapes such as disused access tracks should be rehabilitated.
- Roads, management tracks and firebreaks should follow the natural landform, or land-use patterns.
- Prescribed burning operations (if required) should incorporate prescriptions and techniques that minimise the visual impact.
- Where structures are required they should be sympathetic in design, materials and colour to surrounding landscape elements and be carefully sited away from major natural focal points, out of viewer sight-lines and where appropriate, screened by vegetation or landform.

LANDSCAPE DESCRIPTION

The Park is located in the Swan Coastal Plain landscape character type (Department of Conservation and Land Management, 1994). The Park is situated on two major geomorphic landforms: the Quindalup and the Spearwood Dune Systems. Within the Quindalup System, the Rockingham-Becher Plain is a distinct feature characterised by linear, parallel dunes and swales. Wetlands are situated in a series of low lying areas between the dunes, which are roughly parallel to the coast. The vegetation on the dunes ranges from coastal heath and scrub, to banksia and eucalyptus woodlands.

LANDSCAPE QUALITY

The Park's landscape encompasses areas that can be described as being of high, medium, or low visual quality. These categories can be mapped using DEC's *Visual Landscape Management System* (1989). Generally in the Park there is a direct correlation between the intactness of natural elements (vegetation, landform and waterbodies) and high scenic quality. The rural north-east corner of Lake Walyungup and the recreation camps of Cape Peron can also be described as having scenic values as cultural heritage landscapes. Areas of low scenic quality are generally highly disturbed, for example, areas at Lark Hill degraded by off-road vehicle use.

Several of the major roads adjacent to the Park, particularly Ennis Avenue and Mandurah Road, offer enjoyable scenic experiences, with close proximity to the Park and extensive views often taking in a variety of the Park's special landscape characteristics. The Perth to Mandurah Railway east of Ennis Avenue has reduced scenic viewing opportunities from the road, although rail passengers are able to enjoy views across the Park. The scenic-drive value of Mandurah Road should be maintained where possible.

Maintaining or improving the natural and cultural landscapes of the Park is an integral component of effectively managing the Park. While this means protecting natural areas, in other instances this involves rehabilitating modified landscapes of the Park. View corridors, incorporating the use of low vegetation, should be considered in rehabilitation planning. Planting of non-local species may be allowed at historical sites where those non-local species are non-invasive.

LANDSCAPE CHARACTER

The diverse and distinctive landscape character types represented in the Park are integral to its scenic value, and they offer visitors a range of scenic experiences. They include rural, wetland, woodland and cultural landscape types. Understanding the different landscape character types helps Park managers to preserve them, and to enhance visitors' enjoyment of them through the provision of lookouts and interpretation facilities.

Strategies

1. **Identify and protect important landscapes within the Park. (DEC, CoR) [Medium]**

2. **Ensure that recreation facilities and park furniture are of a high standard and suited to the surrounding landscape. Facility provision should be planned and agreed by the managers of the Park. (DEC, CoR) [Ongoing]**

3. **Take all reasonable steps to ensure that new infrastructure and developments within or adjacent to the Park are designed to minimise impacts on visual quality. Liaise with DoP, the Water Corporation, and other infrastructure providers and development proponents before works are undertaken. (DEC, CoR) [Ongoing]**

4. **Identify sites of low visual quality (e.g. unsealed parking areas and roads, as well as degraded and weed infested areas) and undertake appropriate remedial action. (DEC, CoR) [Low]**

5. **Consider view corridors when undertaking rehabilitation works within the Park. (DEC, CoR) [Ongoing]**

26. Regional Ecological Linkages and Greenways

The objective is to encourage appropriate management of corridors and linkages between the Park and other conservation or recreation areas.

The purpose of ecological linkages is to connect natural areas, preferably with continuous corridors of native vegetation, in ways that allow both fauna and flora (pollen and seeds) to move between these areas to access resources and suitable habitat for survival and reproduction.

Regional ecological linkages aim to link protected, regionally significant natural areas by retaining the best condition local natural areas available between them that can act as stepping stones for flora and fauna. This increases the long term viability of the regionally significant natural areas as well as the local natural areas in the link.

The term 'greenways' has also been used to define 'networks of land containing linear elements that are planned, designed and managed for multiple purposes including ecological, recreational, cultural, aesthetic, or other purposes compatible with the concept of sustainable use' (Ahern, 1995). It is a generic term that has been applied to a wide range of landscape planning strategies, concepts and plans (Tingay and Associates, 1998).

Regional ecological linkages or greenways are essential features of urban areas as they have a conservation role; provide protection for water quality, may contain vegetation which can sequester greenhouse gases and have an educational and aesthetic value (Tingay and Associates, 1998). Regional ecological linkages have been identified in Tingay and Associates (1998), Government of Western Australia (2000) and Del Marco *et al.* (2004).

Rockingham Lakes Regional Park is situated on the edge of the rapidly expanding south-west corridor of Perth. It is important to maintain and improve regional ecological linkages and greenway corridors between the estates of the Park and adjoining areas of ecological significance. This is necessary to help maintain the diversity and vigour of the ecological systems of the Park and to help integrate the Park within the broader urban landscapes.

Within the Park, regional ecological linkages are needed to link the discrete and separated areas of the Park from the coast through to the Stake Hill wetlands and from Cape Peron and Port Kennedy through to Lakes Cooloongup and Walyungup. A study of Perth's Greenways identified proposed greenway corridors linking the Park internally and to external areas (Figure 7).

The interface between the Park and adjoining land uses plays a major role in either insulating the Park from, or exposing it to, undesirable impacts of these land uses. The spread of invasive weed species can be minimised by the creation of appropriate buffers and by planting local species in existing buffers and road reserves. Where development is to occur adjacent to the Park, it is preferable that a road is constructed between the development site and the Park, as it improves management and fire access, separates land uses, improves informal surveillance and reduces rubbish dumping.

Although this Plan advocates the creation and protection of regional ecological linkages, their creation is beyond the scope of the Plan. DEC will liaise with relevant agencies as required in relation to the establishment and management of these linkages.

Strategies

1. **Liaise and develop partnerships with the landowners and relevant agencies involved with proposed regional ecological linkages near the Park to develop a coordinated approach to their establishment and management. (DEC, CoR) [Ongoing]**

2. **Encourage future providers of transport to adopt 'wildlife friendly' designs, and management practices. (DEC, CoR) [Medium]**

3. **Develop a list of Park-compatible plants to be provided to Park neighbours and infrastructure providers. Local plant species should be used in landscaping road reserves near the Park. (DEC, CoR) [Medium]**

4. **Liaise with DoP so that future development proposals adjoining the Park incorporate appropriate interface treatments with the Park. (CoR, DEC) [Ongoing]**

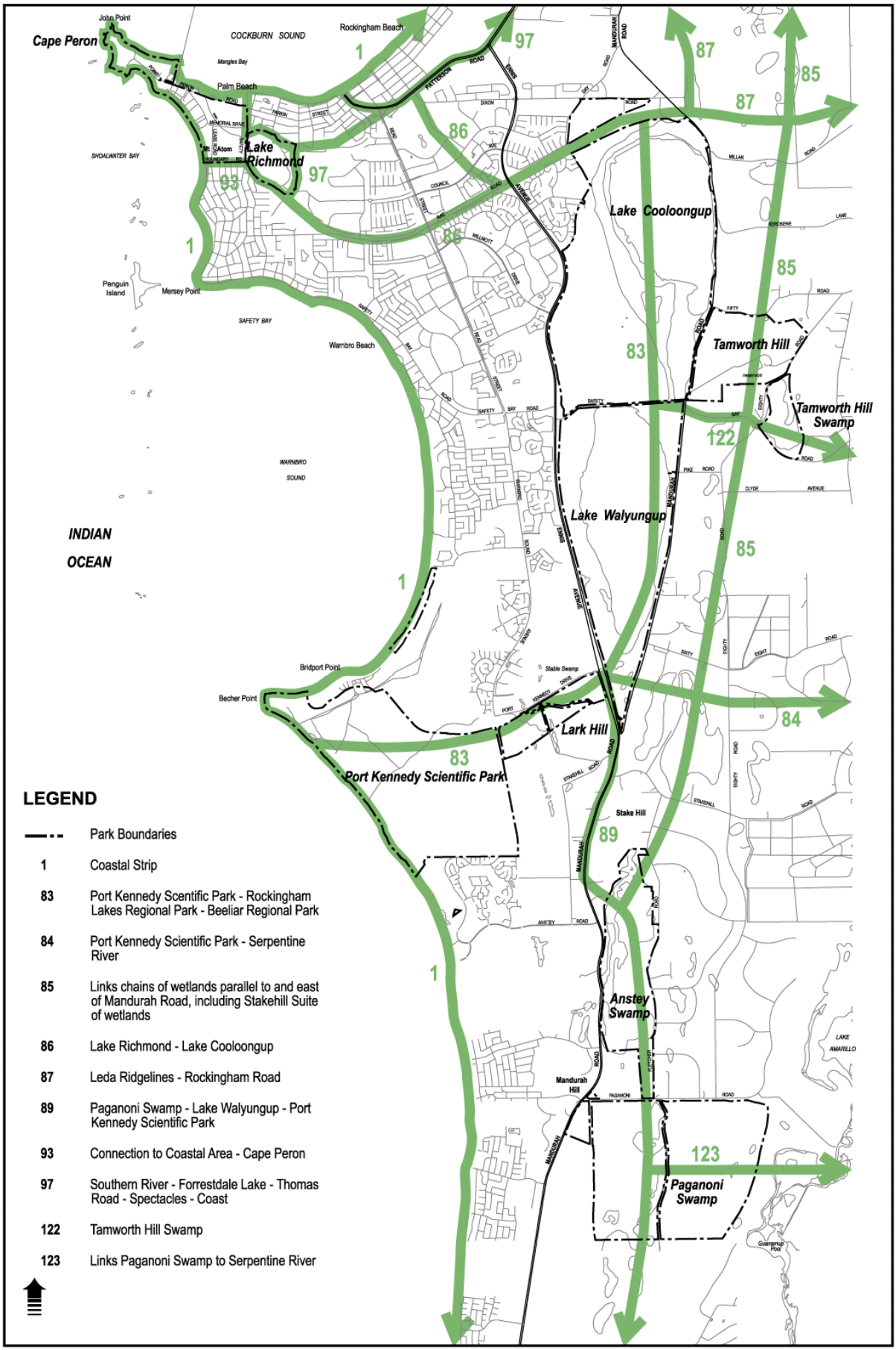

Figure 7 - Greenway Corridors and Links

D. MANAGING CULTURAL HERITAGE

27. Guiding Principles for Managing Cultural Heritage

1. Conservation and protection of cultural heritage

The Park will be managed in a way that delivers community benefits by maintaining cultural traditions and attributes. Heritage sites will be preserved and maintained for their inherent cultural and social values. Impacts from human use and management practices will be minimised in order to maintain heritage values.

2. Consistency of management policies

The managing agencies involved in the Park will apply management actions that are consistent with State, national and international heritage legislation, conventions and guidelines.

3. Community involvement

The community will be involved in managing sites of heritage value. Aboriginal people are especially encouraged to be involved and should be provided with alternative consultation opportunities in the management of the Park.

4. Research and interpretation

Where appropriate, interpretive information will be provided to enhance community understanding of, and appreciation for heritage sites.

5. Restoration of cultural heritage

Where possible, heritage sites will be restored to protect and maintain their value. Sites with high heritage significance will be considered priorities.

Strategy

1. **Apply the above principles as required in managing the cultural heritage of the Park. (DEC, CoR) [Ongoing]**

28. Aboriginal Cultural Heritage

The objective is to identify, protect and appropriately manage sites with Aboriginal cultural heritage value within the Park.

ABORIGINAL ASSOCIATION AND USE

The Aboriginal people of the Rockingham area are part of the Nyoongar people. It has been recognised that Nyoongar people that lived in the south-west of Western Australia had a close relationship to their land and an intimate knowledge of what it contained (Berndt, 1979). The Rockingham area holds much significance and many sacred sites for Aboriginal people (Walley, *pers. comm.,* 2002). There is however little recorded information about Aboriginal association and use of lands that comprise the Park.

Nyoongar people traditionally lived a nomadic hunter-gatherer lifestyle, travelling to and from destinations and

meeting areas throughout the seasons (Hayden and Hayden, 2002). Food resources such as wild fruits and fish were plentiful and generally reliable for Aboriginal people who lived in the south-west (Lofgren, 1975; Hammond, 1980).

Wetlands in the Park are likely to have cultural and spiritual significance for Nyoongar people. These were sources of abundant food throughout the year, as well as places of ceremony and trade.

Lake Richmond was identified as a site of significance to Nyoongar people due to its use for food and water, as a camping site and for its spiritual significance (Bowman Bishaw Gorham, 1997). Camping would have occurred away from the water's edge so as not to disturb local wildlife (Draper, 1997).

Lakes Cooloongup and Walyungup also hold special Dreaming significance as places where the Sea Waugal laid her eggs (Walley, *pers. comm.*, 2002). Both of these names are Nyoongar in origin (Draper, 1997). Cooloongup means *place of children* and Walyungup means *place where Nyoongars talk* (Walley, pers. comm., 2002). Lake Cooloongup could be thought of as a place for children, whereas Lake Walyungup is a place for adults. Karnup refers to the locality around Paganoni Swamp, and this name means *place of Dreaming*. It may be thought of as a place for spiritual beings (Walley, *pers. comm.*, 2002).

The Park still holds significance for Aboriginal people. Local Nyoongar people maintain the Aboriginal link and traditions to the land and to the Park (Walley, *pers. comm.*, 2002).

There are seven Aboriginal Heritage Sites in the Park listed by the Department of Indigenous Affairs (DIA). Two are at Lake Richmond and five at Cape Peron.

Other Aboriginal sites may exist in or adjacent to the Park that are not yet known to DIA, or may not yet been listed on the Aboriginal Heritage Register.

MANAGEMENT OF ABORIGINAL CULTURAL HERITAGE

A key issue in the management of the Park is to ensure that Aboriginal sites within the Park are protected from damage such as that which may occur during maintenance operations or construction works projects. It is therefore the responsibility of the managing agencies to ensure that obligations are fulfilled according to the Commonwealth *Native Title Act 1993* and the

Aboriginal Heritage Act 1972, before any planning or public works take place**.**

Additionally, it is important that local Aboriginal people are provided the opportunity to be involved in projects and the management of the Park. There may be opportunities for Aboriginal eco-tourism and nature-based activities within the Park. This would be consistent with the objectives of the Park. Should any such proposal be formalised, it will be subject to further community consultation.

Aboriginal Heritage Act 1972
Under the *Aboriginal Heritage Act 1972,* it is an offence to damage, alter or destroy any Aboriginal sites unless written consent has been obtained from the Minister for Indigenous Affairs. This includes sites not yet registered under the Act.

Native Title Act 1993
The lands that comprise Rockingham Lakes Regional Park are subject to a native title claim, which directly covers the Park area.

In accordance with the Commonwealth *Native Title Act 1993*, notification in writing is required for public works constructed on all reserved lands and waters managed by DEC. Parties that require notification are:

- representative Aboriginal bodies; and
- registered native title bodies (corporate) and registered native title claimants for land or waters managed by DEC on which the operations are to be carried out.

These parties need to be given the opportunity to comment on the proposed public works. A 'public work' is defined in the *Native Title Act 1993* to include buildings, structures which are fixtures, roads, bridges, wells, bores and major earthworks constructed or established on behalf of the Crown.

Additionally, a management plan for any national or State park intended to preserve the natural environment of an area must be notified in the same manner as for public works. Native title claimants and registered native title bodies were informed of this Plan's preparation at the commencement of the planning process.

Strategies

1. **Involve Aboriginal groups in the management of the Park. (DEC, CoR) [Medium]**

2. **Incorporate information on Aboriginal history and significance of the Park into interpretive material where appropriate (Section 45). (DEC, CoR) [High]**

3. **Fulfil management obligations according to the *Aboriginal Heritage Act 1972* and the *Native Title Act 1993* before any planning or public works take place. (DEC, CoR) [Ongoing]**

4. **Nominate any Aboriginal sites identified for consideration for inclusion on the Aboriginal Heritage Register. (DEC, CoR) [Ongoing]**

29. Non-Aboriginal Heritage

The objective is to identify, protect and appropriately manage sites of non-Aboriginal cultural heritage value within the Park.

The first European exploration of the Rockingham area occurred between 1801 and 1804 by a French expedition under Commodore Nicolas Baudin (Fall, 1979). Baudin named a number of significant features along the coastline, including Cape Peron, Ile Buache (later renamed Garden Island) and Ile Bertollett (later renamed Carnac Island) (Draper, 1997).

The name 'Rockingham' commemorates a ship that ran aground in stormy conditions in 1830 opposite the present location of Governor Road (Fall, 1972).

Farmers settled the eastern parts of Rockingham in the earliest days of European settlement in Western Australia, many moving south to the area to find more arable soils than those near the failed settlement of Clarence, near Woodman Point (Fall, 1972).

As settlement in the area continued, Mangles Bay was determined a suitable port for the shipment of timber, which was a growing and important industry to the colony. A new waterfront townsite was marked out by Surveyor-General Roe, and declared open for selection and sale of lots in 1847 (Fall, 1972). In 1870, several jetties were built in Mangles Bay and in 1872 a railway was completed along with a deep sea jetty (Government of Western Australia, 1979). For many years, the port at Rockingham was connected to the plentiful timber supplies of the Darling Range by the Rockingham-Jarrahdale railway. These developments founded the importance of Rockingham as a port and assured the associated development of the town.

In the early years of the twentieth century, Rockingham declined as a favoured port for timber export. This was related to a number of factors, including the increasing appeal of Bunbury port, Bunbury's proximity to the larger timber supplies of the south-west, the opening of the inner harbour and associated modern facilities at Fremantle, and the increase in the size of ships which had difficulty in traversing Parmelia Bank to access Rockingham (Fall, 1972). With the expansion of the timber industry in the south-west, the market for Jarrahdale timber changed from export to local, removing a large amount of business from Rockingham port (Fall, 1972). Thus, the port ceased to exist and Rockingham became a small seaside resort.

During the Second World War, the HMAS Stirling Naval Base at Garden Island was developed as a prominent centre of military and naval operations. Garden Island and Cape Peron gun emplacements were in the planning stages from early in 1942, and

plans were expedited with the fall of Singapore. By March 1943, the first guns were in position and had been 'proof fired'. Following the Second World War the base continued to operate predominantly for army training (Draper, 1997).

Improvement to transport and infrastructure systems lead to an increase of visitors and residents to the Rockingham area. Significant industrial growth occurred in the region in the early 1950s, particularly in Kwinana, directly to the north. Rockingham has since continued to experience growth in commercial, light industry and residential sectors. Despite the development that has occurred, numerous historic buildings and sites relating to early European settlement have been retained in Rockingham and in the Park.

Heritage of Western Australia Act 1990

The Heritage Council of Western Australia maintains a Register of Heritage Places in accordance with the *Heritage of Western Australia Act 1990*. Under the Act, places entered in the State Register are given legal protection and all development proposals affecting these places are required to be referred to the Heritage Council of Western Australia for advice. There are no sites within the Park listed in the State Register.

The Government Heritage Property Disposal Process provides for the identification and assessment of heritage value of government property under consideration for disposal, and for relevant protection to be provided where appropriate. DEC will liaise with the Heritage Council of Western Australia where property is to be disposed of on Crown land and where heritage values may exist.

Local governments are required by the *Heritage of Western Australia Act 1990* to maintain a heritage inventory, and they have the power to protect these sites by including them in the local town planning scheme. The Cape Peron Battery Complex, buildings at DoE's School Camp at Cape Peron, Port Kennedy Scientific Park, Lake Richmond, and buildings and the former railway site in the East Rockingham Heritage Precinct on Dixon Road are listed on the City of Rockingham Municipal Heritage Inventory.

The Cape Peron Battery Complex is also permanently registered on the Register of the National Estate.

With respect to non-Aboriginal heritage sites, key issues that need to be addressed include general maintenance and management of sites in the Park and development of appropriate processes to involve interested parties in restoring and utilising sites of cultural significance.

Strategies

1. **Incorporate information on non-Aboriginal history of the Park into interpretive material where appropriate (DEC, CoR) [High]**
2. **Ensure obligations under the *Heritage of Western Australia Act 1990* are met. (DEC, CoR) [Ongoing]**
3. **Nominate additional significant sites for heritage listing on either the City of Rockingham Municipal Heritage Inventory, or State or National Heritage Registers. (DEC, CoR) [Ongoing]**
4. **Liaise with any relevant State agency prior to the future heritage listing of additional sites within the 'Area Subject to Future Planning' at Cape Peron. (DEC, CoR) [Ongoing]**
5. **Develop management guidelines for historic sites in consultation with appropriate conservation bodies, such as the Heritage Council of Western Australia, Western Australian Museum, National Trust, Australian Heritage Council and historical societies. (DEC, CoR) [Medium]**

E. MANAGING RECREATION

30. Guiding Principles for Managing Recreation

1. Preserving the value of the land itself
Natural systems (including landscapes, particular sites and biota) should be able to sustain the recreation that occurs or is proposed. Recreation should be focused in public use areas of the Park. The intensity of recreation activities may need to be controlled to maintain the amenity of the Park and the enjoyment of visitors.

2. Consistency of recreation with reserve purpose
Recreational activities must be compatible with the assigned purpose of reserves within the Park. Reserves within the Park will be assigned an appropriate purpose for the protection and enhancement of Park values under the *Land Administration Act 1997*.

3. Equity
A range of activities consistent with a reserve's purpose should be allowed in the Park. However, uses that negatively affect other forms of acceptable use or jeopardise the safety of visitors should be specifically managed, directed to more appropriate places or not permitted.

4. Management
Activities and facilities must comply with the managing agencies' requirements. If effective management of recreational activities or facilities cannot be provided they should be restricted, relocated or removed from the Park.

5. Recreation opportunities
A range of recreation opportunities should be provided for in a local and regional context thereby providing Park visitors with a choice of recreation activities and experiences which enhance the values of the Park. The Recreation Opportunity Spectrum is a planning tool to guide the provision of a range of opportunities in a given area, while limiting unintended incremental development and inappropriate uses (Stankey and Wood, 1982). Principles of the Recreation Opportunity Spectrum have been used in developing the Recreation Masterplan (Appendix A).

Strategy

1. **Apply the above principles as required in managing recreation in the Park. (DEC, CoR) [Ongoing]**

31. Visitor Use

The objective is to encourage visitor use whilst ensuring that the level of use and behaviour are sustainable and minimise conflict with other Park visitors and values.

Visitor surveys were undertaken in 2001 and 2005 to gain an understanding of the number of visitors to the Park, their patterns of use and the types of activities occurring in DEC-managed areas of the Park (Colmar Brunton, 2001 and 2005). Areas managed by DEC within the Park received an estimated 260,000 visits per year (Colmar Brunton, 2005). This represents a significant increase in visitors over the period 2001-2005 (Colmar Brunton 2001 and 2005). Cape Peron is by far the most visited site within the Park, with an estimated 120,000 visits per year (Colmar Brunton, 2005).

Recreation activities undertaken in the Park include:

- authorised model aircraft flying (Lake Walyungup);
- authorised land yachting (Lake Walyungup);
- boat, jet-ski and windsurfer launching (Cape Peron);
- exercise, walking and jogging;
- fishing (Cape Peron and Port Kennedy);
- golf (Rockingham Golf Course);
- nature observation;
- picnicking and barbecues;
- relaxation;
- snorkelling and scuba diving (from Cape Peron); and
- swimming (Cape Peron and Port Kennedy).

Detailed surveys were undertaken at Cape Peron and Lake Walyungup in 2005 to provide an indication of visitor demographics, patterns of use and attitudes. The survey found that the majority of visitors to Cape Peron visit by themselves or in couples, although the presence of the recreation camps at the Cape means that large groups use the site. Most visitors arrive at Cape Peron by private vehicle. The majority of those surveyed in 2005 had been to the Cape previously, with 68% being local residents. A relatively large proportion of visitors surveyed: 21%, were visiting from other parts of the Perth metropolitan area. Popular activities at Cape Peron are fishing and walking, and other activities include walking dogs, diving, swimming and picnicking (Colmar Brunton, 2005).

By comparison, Lake Walyungup was found to have a lower level of visitation. Most visitors arrived at Lake Walyungup by car, and 81% of those surveyed lived locally. Popular activities at the site include walking and dog exercising (Colmar Brunton, 2005).

The results of the 2001 and 2005 visitor surveys demonstrate that the level of visitor use varies greatly within the Park. Due to the lack of formal access and facilities, visitor use in the wetland and eastern areas of the Park is lower than the coastal areas and established parklands. Cape Peron has a higher profile, with established access and facilities, and attracts visitors from a larger catchment.

The trend of increasing visitor numbers to the Park, demonstrated by visitor surveys, is expected to continue given the Park's location in a rapidly growing urban area. The population in the City of Rockingham is predicted to increase from the 2007 level of 91,900 to 134,120 in 2021 (City of Rockingham, 2009). The Rockingham tourism industry is also experiencing growth, particularly in the daytrip market (Backshall and TourCorp, 1999). Urban growth and tourism development in the region will have implications for visitor use of the Park.

Vandalism and other anti-social behaviour
Vandalism and thefts from cars are known problems at Cape Peron and Lake Richmond and other isolated bushland sites in the Park. This may be addressed in part by redesigning recreation sites to improve the circulation of traffic and increase the visibility of parked cars. DEC and the City of Rockingham will consider this issue when designing or re-designing recreation facilities and sites. Consideration may also be given to closing some sites that receive high levels of vandalism and anti-social behaviour at night.

Strategies

1. **Develop and implement a visitor survey programme to gain an understanding of visitor use, numbers and satisfaction within the Park. Use DECs VISTAT (a quantitative system for recording and monitoring visitor levels) as a basis for the programme. (DEC, CoR) [High]**

2. **Investigate and implement site design and management measures to reduce anti-social behaviour in the Park. (DEC) [High]**

Key performance indicators for visitor use
The success of these strategies will be measured by: 1. Changes in visitor numbers and satisfaction levels. 2. Provision of formalised access in the Park (as per Section 32 – Recreation Masterplan). 3. Existence of a visitor survey programme.
Target: 1. No decline in visitor satisfaction. 2. Complete access and circulation components of the Recreation Masterplan. 3. Approval of a visitor survey programme.
Reporting: 1. Every 5 years. 2. Every 5 years. 3. Every 5 years.

32. Recreation Masterplan

A Recreation Masterplan (Appendix A) has been prepared to help ensure that a variety of recreation opportunities are offered in the Park. The Masterplan will also help coordinate recreation developments within the Park and allocate appropriate facilities and services to those areas of the Park best able to accommodate them in a sustainable manner. Developments, where possible, will utilise already degraded sites.

The Masterplan reflects the management zones and land uses described in Section 10 of this Plan. The five management zones (Conservation and Protection; Natural Environment Use; Recreation; Special Use, and 'Area Subject to Further Planning') provide a guide to acceptable facilities and uses at a given site (see Table 1). The Masterplan considers access, internal circulation and the type of facilities to be provided within the Park.

Access to the 'Conservation and Protection' areas of the Park will be limited, with an emphasis on enjoyment of nature, interpretation, education and habitat protection.

The 'Natural Environment Use' areas will have greater access, primarily by walking trails and cycle paths. The provision of some facilities within these areas is anticipated.

The 'Recreation' areas will be the most intensively used and modified sections of the Park. The emphasis will be on providing well-designed recreation facilities without detracting from the natural or cultural values of the Park.

'Special Use' areas are operationally outside of the Park because they are managed for purposes other than conservation, recreation and visitor services. There is no public access to these areas.

Current uses and facilities will be maintained in the 'Area Subject to Further Planning', pending the outcomes of further planning and State government decisions on the proposed Mangles Bay Marina Tourist Precinct.

Strategy

1. **Implement the Recreation Masterplan that allocates appropriate facilities and services to those areas of the Park best able to accommodate them in a sustainable manner. (DEC, CoR) [High]**

33. Recreation Sites and Facilities

The objective is to provide and manage a range of quality recreation sites and facilities that allow for a diversity of recreation opportunities without conflicting with other Park values.

There is scope for improvement and/ or expansion of sites that can sustain increased visitor use in some areas of the Park, such as Cape Peron and Lake Richmond, and minimise the impacts of uncontrolled visitor access in others.

In recreation planning, actions that have, will have or are likely to have a significant impact on a matter of national environmental significance (such as the threatened ecological communities in the Park, the Becher Point Wetlands Ramsar site and listed flora and fauna species) are subject to an assessment and approvals process under the EPBC Act 1999.

The development of recreational facilities in the Park will be guided by Australian standards.

The main areas or 'estates' of the Park are described below in a recreation context:

1. Cape Peron
Cape Peron is notable for the breadth of coastal recreation opportunities it offers and for its scenic views. The exposed southern shore of the Cape combines rugged limestone cliffs and reefs with sandy beaches, while the northern shore offers a more enclosed, sheltered setting.

The Cape's accessibility and high scenic value make it a favourite sightseeing destination, while it is also popular for activities including fishing, walking, exercising dogs, diving, swimming, picnicking and windsurfing. Facilities provided include trails, a lookout and parking areas. A boat ramp is situated on the north side of the Cape, near the Garden Island Causeway. Toilets and car parking are available near the boat ramp.

Cape Peron constitutes a fragile coastal environment that may contain visitor risks. Visitor access needs to be directed away from sensitive and dangerous areas. Facilities and interpretive information have been improved at selected locations to enhance visitor experiences.

Given its relatively isolated location, vandalism and anti-social behaviour are ongoing management problems at Cape Peron which detract from visitor enjoyment and safety and create extremely high management costs. The issues of vandalism and anti-social behaviour are taken into account when planning for and designing facilities at this location. Consideration may also be given to closing the site at night to manage the problem.

The Recreation Masterplan aims to enhance recreation and aesthetic values through facility upgrades and rehabilitation of degraded areas. Works to protect Aboriginal and non-Aboriginal heritage values of the Cape will be undertaken.

Detailed planning has been completed specifically for Cape Peron, which includes site design plans, as well as landscape management and development guidelines, which outline ways of preserving and enhancing the area's landscape values. Should the proposed Mangles Bay Marina Tourist Precinct project proceed and the 'Area Subject to Further Planning' be excised from the Park then this detailed planning will cease to apply to that area.

2. Lake Richmond
Lake Richmond is an attractive expanse of water in an urban setting, as well as an important ecosystem particularly for thrombolites and waterbirds.

Lake Richmond is used for walking, bird watching and nature observation. Picnic tables and a barbecue are located in the north-west corner of the reserve. A walk trail borders part of the lake, and leads to a boardwalk on the northern shore.

The Naragebup Rockingham Regional Environment Centre is located adjacent to Lake Richmond on Safety Bay Road, on land vested in the City of Rockingham. The Centre plays an important role in providing visitors with educational and scientific information on the Rockingham Lakes Regional Park.

The foremost recreation management issue at Lake Richmond is ensuring that visitor use and facilities do not adversely affect the threatened ecological community of thrombolites. This is particularly relevant given the nearby residential development which has increased the number of people living in close proximity to the Lake. It is expected that use of the lake as a recreation resource will also increase.

3. Lake Cooloongup
Lake Cooloongup is a visually and spatially dominant feature of the Rockingham landscape. The lake, with its sparsely vegetated margins and surrounding woodlands, offers opportunities for trail-based recreation opportunities in a natural setting of high scenic quality.

Recreational use of Lake Cooloongup is relatively low, however it is expected that visitation will increase over time as the City of Rockingham population grows.

There are informal walking tracks through the woodlands north and west of the lake. There are pedestrian access ways at several locations around the lake. The Masterplan aims to facilitate low key recreation access to the woodlands around the lake.

The City of Rockingham proposes to establish a heritage precinct in the north-west corner of Lake Cooloongup. Plans for this area are yet to be finalised.

4. Lake Walyungup
Similar to Lake Cooloongup, Lake Walyungup is an extensive landmark, highly visible from adjoining roads and the Perth – Mandurah Railway which passes to the west. The north-east corner of Lake Walyungup is cleared, former farm land. As urban development in the area continues, it will likely be an important remnant rural landscape.

Lake Walyungup is used for walking and nature observation, as well as for model aeroplane flying and land yacht sailing, which are authorised under seasonal permits from DEC. These permits are discussed further in Section 34. The lack of access and facilities at the lake has limited the level and diversity of recreational use. A small parking area and several pedestrian gates are located at the northern end of the lake.

The Recreation Masterplan focuses on preserving the natural character of the area whilst facilitating low key access for appropriate recreation activities. The provision of recreation facilities near Lakeside Deli is considered appropriate.

5. Tamworth Hill and Tamworth Hill Swamp
The Tamworth Hill area is notable for its diversity of landform and vegetation. At 76 metres Australian Height Datum, Tamworth Hill provides for scenic viewing and strenuous walking. The relatively good condition of the Tamworth Hill woodlands, as well as the presence of a significant kangaroo population, offers opportunities for nature study.

There is little recreational use of Tamworth Hill and Tamworth Hill Swamp, however it is likely that nearby residential development will lead to increased use and a demand for facilities. There are no recreation facilities in the Tamworth Hill and Tamworth Hill Swamp areas. Uncontrolled access could create a number of management issues including damage to vegetation, erosion and weed invasion. Fire access tracks are used by walkers to access bushland areas.

The Recreation Masterplan emphasises trail-based recreation, proposing a series of paths to allow visitor use without disturbing sensitive areas. Consideration must be given to buffers around the Water Corporation reservoir in providing recreation facilities at Tamworth Hill.

A management plan for Tamworth Hill Swamp is being developed by the City of Rockingham as a planning condition of the Baldivis Town Centre rezoning (Bowman, Bishaw, Gorham, 2000). The management plan for Tamworth Hill Swamp will be implemented consistent with this Plan.

6. Anstey and Paganoni Swamps
Anstey Swamp is a densely vegetated area that is visible from Mandurah Road. The inaccessibility of the Swamp enhances its natural character. Paganoni Swamp incorporates a variety of landforms and vegetation communities, making it an interesting and attractive bushland setting.

The Perth to Mandurah Railway passes to the west of Anstey and Paganoni Swamps, blocking views to these areas from Mandurah Road. There are, however, impressive views into these areas for railway passengers.

There are no recreation facilities at Anstey and Paganoni Swamps. Although some people use these areas for walking, the main recreational use is horse riding, which is discussed in Section 35.

The Recreation Masterplan for Anstey and Paganoni Swamps proposes low key walk trails which reflect the natural character of these areas.

7. Port Kennedy Scientific Park
Port Kennedy Scientific Park has been reserved for the purpose of conservation of flora and fauna. Scientific research, science education and low-impact recreation, where they do not adversely impact the values of the reserve, are considered complementary uses. Port Kennedy Scientific Park contains the Becher Point Wetlands Ramsar Site, and recreational use of the area needs to be consistent with the requirement to protect the wetlands.

Port Kennedy Scientific Park contains a sequence of geomorphic and wetland features that provide a record of sea level and shoreline changes and wetland evolution. These features provide opportunities for nature study.

The proponent of the Kennedy Bay development is required to undertake public works in the Port Kennedy Scientific Park in accordance with the *Port Kennedy Development Agreement Act 1992.* These works are described in the *Port Kennedy Scientific Park Conservation and Recreation Plan* (RPS Bowman Bisham and Gorham *et al.*, 2007), which was developed in consultation with DEC, and include completion of the vermin-proof fence, establishing and upgrading walking trails, constructing a viewing platform, installing interpretive signs, and undertaking extensive weed control and rehabilitation.

The Cities of Rockingham and Mandurah have discussed the potential for a dual-use path through the Park linking the two municipalities. A dual use path alignment running north-south through Port Kennedy Scientific Park has some merit, but would require more detailed environmental planning and design. Particular considerations include the need to avoid areas of high conservation value and the need to ensure personal security for users of the dual use path, given that the Park is largely isolated from nearby residences and passing traffic.

Given the conservation purpose of this area, the Recreation Masterplan proposes low key recreation facilities and interpretive facilities.

Strategies

1. **Prepare and implement site plans for significant works within the Park. The plans will be prepared in consultation with the community and other managing agencies. (DEC, CoR) [Ongoing]**

2. **Provide suitable and safe recreation facilities to cater for existing and anticipated future demands. (DEC, CoR) [Ongoing]**

3. **Develop facilities and structures in a manner that is sympathetic to the surrounding landscape. (DEC, CoR) [Ongoing]**

4. **Seek conservation and recreation works in the Park as part of major developments near the Park. (DEC, CoR) [Ongoing]**

34. Recreation Activities at Lake Walyungup

The objective is to manage approved recreation uses to ensure they do not adversely impact on the values of the Park.

The wide, flat expanse of Lake Walyungup makes it an attractive location for certain recreational activities. Model aircraft flying and land yachting have occurred at Lake Walyungup for at least 30 years and it is recognised that the lake offers unique recreational opportunities in the metropolitan area. A number of clubs and individuals have permits from DEC to undertake model aircraft flying and land yachting at the lake.

Model aircraft flying has been conducted mainly in summer when the lake bed is dry and the weather conditions are conducive to flying the light model aircraft. Lake Walyungup is an ideal location for this activity because of the large area available for take-off and landing, and the distance from residential areas.

Land yachting has also occurred mainly in summer when the dry lake bed is able to be driven on. The land yachts typically have three wheels and a sail for wind-propulsion. The land yacht club holds regular meetings at Lake Walyungup, with race events around designated courses on an area of the lake.

DEC gives approval to undertake these recreational activities. Applications to undertake the activities are submitted annually, and approval is subject to conditions to manage possible environmental impacts on the lake. Model aircraft flying and land yachting are only permitted in a designated area under dry lake-bed conditions. Other requirements include the provision of a toilet during meetings and a ban on activities on days of extreme fire danger. A visitor risk management programme has also been implemented to mitigate the risk of unexploded ordnance (UXO) which may occur in Lake Walyungup.

Whilst DEC manages potential environmental impacts of the recreational activities on the lake by requiring that certain conditions are met, a better understanding of the possible long-term environmental impacts of the activities would be beneficial. Given the conservation significance of the lake, DEC will continue to monitor the approved activities to determine whether they are having a visible impact on the lake's flora, fauna, and geomorphology.

DEC will continue to manage the recreation activities and will annually review applications to undertake them. The existing recreation activities undertaken by approved individuals and clubs will be allowed to continue at present levels of use, however should it be determined that these activities are creating unacceptable environmental or other impacts, approval will be withdrawn. Based on a precautionary approach, there will be a presumption against allowing new recreation activities on the lake. Any new applications for new recreation activities on the lake, or any requests to increase the level of current activities, will need to demonstrate that the activity will not have an environmental impact, and will need to address potential conflicts of visitor use and risk management.

Strategies

1. **Continue to monitor the approved recreational activities on Lake Walyungup in regard to impacts on flora, fauna, geomorphology and Park visitation. (DEC) [High]**

2. **Continue to manage recreation activities undertaken by approved individuals and clubs at Lake Walyungup at existing levels of use and review them annually. (DEC) [Ongoing]**

3. **Consider any new applications for recreational activities at Lake Walyungup, or requests to increase the level of current activities, on the basis that they will not lead to environmental impacts, conflicts of visitor use and unacceptable risks. (DEC) [Ongoing]**

35. Park Access and Circulation

The objective is to provide safe, convenient and structured access to and within the Park that is consistent with Park values.

Access to and within the Park is a major issue. The Park is well-serviced by arterial roads, however local access points into the Park need to be improved in some areas. Transport corridors traversing or adjoining the Park act as barriers to visitor and management access, for example the Perth to Mandurah railway creates a barrier between the Park and the residential areas to the west.

Whilst access to the Park for recreation and education purposes is a legitimate use, uncontrolled vehicle and pedestrian access has degraded some areas. Effective control of vehicle and pedestrian access is essential.

Park access and circulation are key components of the Recreation Masterplan (Appendix A). A more detailed discussion of access issues occurs below.

ROAD ACCESS

The majority of visitors arrive at the Park by private vehicles from several major arterial roads adjoining and traversing the Park. Ennis Avenue and Mandurah Road pass on either side of Lake Cooloongup and Lake Walyungup, and they also connect to Anstey and Paganoni Swamps in the south. Tamworth Hill and Tamworth Hill Swamp are adjacent to Safety Bay Road, a major east-west link. Port Kennedy Drive runs west from Ennis Avenue towards Port Kennedy Scientific Park. Access to Cape Peron is via local roads.

Whilst the presence of regional roads makes driving to the Park relatively easy, high speeds and large volumes of traffic can create safety issues at entrance and egress points to the Park. There is a need to ensure safe access to the Park.

Concerns have been raised about possible safety issues along Point Peron Road, given the amount of traffic it carries. DEC will liaise with the City of Rockingham regarding this issue.

Safe access and egress to DEC-managed areas of the Park will be considered as part of the visitor risk management programme (Section 37).

PARKING

Parking areas are located at Cape Peron, at Naragebup Rockingham Regional Environment Centre and in the north-western part of Lake Walyungup.

Three key issues relating to parking are:

1. providing safe and convenient parking to facilitate access;
2. reducing the undesirable effects of uncontrolled parking and access; and
3. reducing the level of anti-social behaviour such as car theft and vandalism.

The provision of additional parking facilities as well as upgrading and redesigning the existing parking areas can help in addressing the above issues. Additions or upgrades to parking facilities in the Park contained in the Recreation Masterplan include the following:

- Cape Peron at Shoalwater Bay Beach, Mangles Bay Beach and Point Peron Road;
- Tamworth Hill, off Fifty Road;
- Lake Walyungup, off safety Bay Road.

The provision of a parking area adjacent to Port Kennedy Scientific Park is proposed by the proponent of the of Kennedy Bay development, to enable pedestrian access to Becher Point and the coast south of the Point without impacting on the values of the Park. The aim of the parking area is to provide access to the coast whilst discouraging unauthorised vehicles from traversing the Park, which causes erosion and damage to vegetation.

BICYCLE AND PEDESTRIAN ACCESS

Generally, trails and pathways within and between Park areas are limited. This restricts circulation and connectivity through the Park. An effective path system should have minimal impact upon the values of the Park, whilst allowing visitors to experience the diverse recreation opportunities within the Park. Existing and proposed access and circulation is shown in the Recreation Masterplan (Appendix A).

The City of Rockingham has prepared a local bike plan that will include the implementation of Bikewest's Perth Bicycle Network commuter routes and a prioritised implementation programme for local bicycle routes. Access and circulation planning for the Park will be undertaken in consultation with Main Roads WA, Bikewest and the City of Rockingham.

A dual-use path is proposed for construction around Lake Richmond by the City of Rockingham and it will be connected to the Local Bike Network. Likewise, dual use paths are proposed in a number of locations in the Recreation Masterplan, including Safety Bay Road and Point Peron Road. This will

improve access to the Park for pedestrians and cyclists.

An opportunity exists to provide walk trails in a number of areas in the Park with different design standards to help create a variety of visitor experiences.

ACCESS FOR ALL

Access for people with disabilities is limited because many of the existing paths in the Park are informal or undeveloped. Wherever possible, new paths should be designed to meet Australian Standards. The Recreation Masterplan aims to provide equitable access to a range of recreation facilities.

UNAUTHORISED VEHICLES

Unauthorised vehicles are prohibited in the Park. This has been a management issue throughout the Park, where unauthorised vehicles have driven on pathways and other recreation areas, or have traversed the Park to access adjoining beaches. Private vehicles, including trail bikes, are prohibited except for on designated roads and parking areas. Access outside of these areas may endanger other Park visitors, cause damage to the landscape and adversely affect wildlife. Information on alternative, authorised areas for off-road vehicles may be obtained from the City of Rockingham.

Lark Hill, an area to the east of Port Kennedy and west of Lake Walyungup, has been used in the past for off-road vehicles, particularly trail bike riding. This is inconsistent with this Plan, which zones this area for Conservation and Protection (Figure 4). The site has been fenced and rehabilitation is continuing.

Unauthorised vehicle access has also been an issue in Port Kennedy Scientific Park and on adjacent beaches where it has caused erosion and damage to vegetation. Unauthorised vehicles are prohibited in Port Kennedy Scientific Park. Continuing cooperation between DEC, the City of Rockingham and the proponent of the Kennedy Bay development is required to manage this issue.

The use of motorised and non-motorised recreational watercraft is considered inappropriate within the Park given the potential adverse impacts on native fauna and wetland vegetation.

ACCESS FOR MAINTENANCE VEHICLES

Access for maintenance vehicles is provided at many points throughout the Park, including access for fire vehicles, and those carrying out mosquito control works, rehabilitation works, weed control and watering. As far as practicable these vehicles will use existing pathways and fire access tracks.

BOAT LAUNCHING

Boat launching facilities are located at Cape Peron, adjacent to the Garden Island Causeway. There are no other boat launching facilities proposed for the Park.

Should the proposed Mangles Bay Marina Tourist Precinct proceed, it would increase the use of the waterways around the Park considerably.

Department of Transport is responsible for safety and navigation in the coastal waters surrounding the Park. All boats are restricted to a speed of 8 knots within 100 metres of the shore around Cape Peron and Port Kennedy.

Unauthorised boating is prohibited on all wetlands in the Park. Watercraft used for educational, research, monitoring or managerial purposes may be permitted for use within the Park.

HORSES AND OTHER ANIMALS

The managing agencies recognise that people enjoy riding horses in the Park's natural settings. This attraction, however, needs to be balanced with consideration the following issues:

- the possible damage by horses to the Park's nature conservation values that include introducing or spreading dieback disease, eroding soil, trampling and browsing vegetation and introducing and spreading weeds;
- the potential safety conflicts with other Park visitors; and
- conflict with other visitor experiences.

Horse riding has occurred in the Park, mainly at Anstey and Paganoni Swamps. Investigation of the appropriateness of horse riding at Anstey and Paganoni Swamps was undertaken during the preparation of this Plan, with due consideration of the conservation and recreation values of the Park. This investigation included consideration of opportunities and constraints to horse riding.

The majority of land east and north of Anstey Swamp is zoned rural in the MRS, and the keeping of horses is allowed in some areas subject to approval from the City of Rockingham (Enviro-Agriculture, 2005). The Park therefore offers local horse riders an attractive destination for recreational riding.

Major environmental constraints to horse riding at Anstey and Paganoni Swamps include:

- the presence of conservation category wetlands;
- the presence of regionally significant bushland and rare and priority flora species;
- risk of introducing and spreading pathogens such as dieback pathogens and weeds, particularly at Paganoni Swamp;
- fauna habitat areas; and
- sites of Aboriginal heritage significance.

In addition to the above, major land use constraints to horse riding at Anstey and Paganoni Swamps include:

- existing and proposed urban areas, particularly south of Paganoni Swamp, which may be incompatible with horse riding;
- transport corridors adjoining the Park, particularly around Paganoni Swamp, and the impact of these on the safety of horse riders entering the Park; and
- potential conflict between horse riders and other recreational users.

The outcome of the investigation into horse riding at Anstey and Paganoni Swamps is that horse riding will be allowed at Anstey Swamp on designated tracks. The management of horse riding at Anstey Swamp will be assisted with the provision of interpretive and education material for horse riders. Appropriate track treatments will be provided where required. It is intended that Anstey Swamp will be used by local horse riders who walk horses to the area, rather than as a regional horse riding destination. Therefore float parking is not proposed within the Park.

At Paganoni Swamp, due to the environmental values of the estate and the presence of dieback, horse riding is considered inappropriate and is not permitted. Paganoni Swamp is surrounded on the north and east sides by Paganoni Road and the Kwinana Freeway. The Perth to Mandurah Railway passes to the west. These transport corridors would create barriers and hazards for horse riders trying to enter Paganoni Swamp. On the south side, Paganoni Swamp is adjoined by residential land, which does not allow for the keeping of horses and which is generally incompatible with horse riding.

The arrangements for horse riding at Anstey Swamp will be reviewed over the life of this Plan in light of environmental impacts, the demand for horse riding and potential conflict of use with other visitors. Horse riding may be reviewed and further restricted or prohibited if unacceptable impacts are occurring.

Strategies

1. **Continue to implement the Recreation Masterplan, that will:**
   - **coordinate access and circulation allowing safe and convenient access for visitors to and within the Park;**
   - **integrate with surrounding community and regional path networks;**
   - **provide appropriate recreation facilities and services;**
   - **provide adequate parking facilities; and**
   - **help to restrict private vehicles to designated car parks and access roads. (DEC, CoR) [High]**

2. **Liaise with the City of Rockingham regarding improving safety on Point Peron Road. (DEC) [Medium]**

3. **Provide for emergency response within the Park and where appropriate, ensure new paths allow for emergency and management vehicle access. (DEC, CoR) [High]**

4. **Consider the needs of disabled people when designing recreation facilities and pathways in the Park, using appropriate Australian Standards. (DEC, CoR) [Ongoing]**

5. **Prohibit use of unauthorised vehicles in the Park. (DEC, CoR) [High]**

6. **Prohibit unauthorised watercraft from accessing the wetlands and water bodies of the Park. Watercraft used for educational, research, monitoring or managerial purposes may be permitted for use within the Park with the expressed permission of the relevant managing agencies (DEC, CoR) [Ongoing].**

7. **Allow horse riding at Anstey Swamp on designated tracks, and prohibit horse riding in other parts of the Park. (DEC, CoR) [Ongoing]**

8. **Monitor the environmental impacts, demand for horse riding and conflicts of use with other visitors at Anstey Swamp and if necessary restrict or prohibit horse riding in this location. (DEC) [Ongoing]**

36. Signs

The objective is to provide a system of signs that communicates the location of the Park features, provides orientation assistance, identifies hazards, leads to appropriate use of the recreation areas and helps communicate information about the Park.

Signs play an important role in notifying visitors about access and use, and communicating information about the Park's identity and values. Signs need to be designed and located to provide messages in a consistent way and without compromising the quality of the area in which they are sited.

Existing sign styles vary between those located in areas under the management of the City of Rockingham and those managed by DEC.

Sign System
DEC has developed a sign system for Perth's regional parks to help ensure signs are designed and located appropriately.

The regional parks sign system includes detailed design specifications for all signs provided in the Park. It aims to introduce a suite of signs that are of a high standard, are robust and have a consistent and contemporary style. The signs system includes directional and orientation signs, management signs, risk warning signs and interpretive signs. The sign system also includes a brand image or logo for each park. The Rockingham Lakes Regional Park brand image will be used on a number of sign types to enhance public recognition of the Park.

The City of Rockingham will be encouraged to adopt the regional parks signs system and brand image for signs in areas of the Park under its control.

Sign Plan
The sign plan directs the placement of signs within the Park. Informative, directional and interpretive signs will be placed at prescribed locations within the Park.

Strategies

1. **Implement the regional parks sign system and the sign plan for the Park. (DEC) [Ongoing]**

2. **Encourage the City of Rockingham to adopt the regional parks sign system and park logo to ensure consistency of signs within the Park. (DEC, CoR) [Ongoing]**

37. Visitor Safety

The objective is to take all reasonable and practical steps to ensure the safety of visitors in the Park.

There is always an element of risk in outdoor recreation activities. Nevertheless, all reasonable and practical efforts will be taken to minimise risks to visitors.

Visitor safety will be promoted through information and education about potential problems and risks. Management actions to reduce safety hazards should, if possible, be consistent with the values of the Park and should not intrude unduly on the experience of visitors. Visitor safety will also be considered in the design of recreation sites and facilities. Visitor safety will be an integral component in undertaking maintenance and capital developments within the Park.

When managing risk, DEC is guided by *Visitor Risk Management Policy, Policy Statement No. 53*.

Unexploded Ordnance
Lake Cooloongup, Lake Walyungup, Port Kennedy Scientific Park and Lark Hill estates are potentially contaminated with UXO. These areas were used as an artillery range by the Department of Defence around the time of World War II.

DEC has worked with FESA, the City of Rockingham, Department of Defence and local police to determine the extent of the UXO risk and to consider mitigation options. A clearance survey has been undertaken on strategic fire access tracks to allow safe access for visitors, management and fire fighters. DEC will continue to liaise with FESA regarding the management of UXO risk in the Park.

Strategies

1. **Implement and regularly review the visitor risk management programme to ensure all known risks are managed and monitored. (DEC, CoR) [Ongoing]**

2. **Ensure visitor safety and risk management are integral components in the design of sites and facilities and in undertaking works programmes, capital developments and facility maintenance within the Park. (DEC, CoR) [Ongoing]**

3. **Provide information to visitors highlighting potentially hazardous areas, activities and appropriate preventative actions and emergency procedures. (DEC, CoR) [Medium]**

4. **Liaise with the FESA regarding the management of UXO risk in the Park. (DEC) [Ongoing]**

F. MANAGING SUSTAINABLE RESOURCE USE

38. Guiding Principles for Managing Sustainable Resource Use

1. Consistency of land use with reserve purpose

Activities must be compatible with the assigned purpose of reserves within the Park and should be of service to Park visitors. Reserves within the Park will be afforded an appropriate purpose for the protection and enhancement of Park values under the *Land Administration Act 1997* (Table 1).

2. Preservation of the values of the land itself

Land use should not compromise the natural and cultural values of the Park. Future developments should be of a character and arrangement that do not detract from the natural settings or landscape values of the Park. Through the development approvals process, proponents of significant developments within the Park may be required to assess the environmental impacts of the proposed land use.

3. Equity

Land use within the Park should be of a nature that promotes multiple uses by Park visitors. Uses that impact upon other forms of acceptable use or jeopardise the safety of visitors should be specifically managed, directed to more appropriate places or not permitted.

4. Open and competitive assignment processes

Relevant State and local government guidelines will be followed to ensure that opportunities for commercial concessions in the Park are assigned based on an open and competitive process.

5. Leased or owned by the managing agencies

Commercial use of areas within the Park should be either through a lease or licence arrangement. Alternatively, the managing agencies may own and operate facilities or developments.

6. Financial viability

Through the tendering process, proponents of significant developments within the Park will be required to document the financial viability of the proposed commercial use. Revenue generated by commercial use within the Park will be used to help meet the cost of managing regional parks.

7. Management compliance

Activities and facilities must comply with the managing agencies' requirements. If effective management of commercial facilities or activities can not be provided, they should be restricted to appropriate levels, relocated or removed from the Park.

Strategy

1. **Apply the above principles as required in managing sustainable resource use in the Park. (DEC, CoR) [Ongoing]**

39. Commercial Concessions – Leases and Licences

The objectives are to ensure that commercial concessions are consistent with the values of the Park, enhance visitor satisfaction and help offset regional park management costs.

Commercial concessions (leases and licences) may be granted on lands within the Park to provide appropriate facilities and services for visitors. A lease allows the lessee to occupy a particular area of land, whereas a licence allows the licensee to enter and use the land.

Leases and licences provide a mechanism to bring additional facilities and management expertise into visitor services. Concessions need to be carefully designed and managed to ensure they do not detract from the conservation and landscape values of the Park. Appropriate concessions can generate income to help offset Park management costs and can significantly enhance public access and enjoyment of the Park.

The managers of the Park will assess commercial concessions according to the guiding principles and objectives set out in this Plan.

According to the CALM Act, the Director General of DEC may grant a lease on land vested in the Conservation Commission. The Director General may apply terms and conditions as appropriate and the term of the lease may not exceed 21 years, but may include an option for renewal. The lease must be tabled before each House of Parliament within 14 sitting days of its execution by all parties to the grant or renewal.

Under the same Act, the Director General of DEC may grant a licence in writing to any person to enter and use certain land.

Commercial concessions must be consistent with the purpose of the reserve and the protection of its values. Commercial concessions on land managed by DEC within the Park will be established and managed in accordance with *Recreation, Tourism and Visitor Services Policy Statement No. 18*. The tendering process for proponents of commercial concessions within the Park will be consistent with State and local government tendering processes. Leases for recreation camps, clubs and associations are not subject to the same tendering processes.

Leases and licences pertaining land managed by the City of Rockingham land require approval from the City.

The Park managers will manage the leases to ensure that they are operated in accordance with this Plan. Particularly significant issues include maintaining vegetation within lease areas, managing weeds and rubbish, and managing visitor risk.

Advertising within the Park requires the approval of the relevant managing agency.

EXISTING CONCESSIONS FOR VISITOR SERVICES

LEASES

Existing leases for visitor services are as follows:

- private recreation camps at Cape Peron;
- DoE's School Camp at Cape Peron;
- Rockingham Volunteer Sea Rescue Group Inc., off Point Peron Road;
- DoT boat shed, off Point Peron Road;
- Naval Association of Australia, Rockingham Subsection, off Point Peron Road;
- Naragebup Rockingham Regional Environment Centre Inc., Safety Bay Road;
- Rockingham Golf Course, Elanora Drive; and
- Lakeside Deli, Mandurah Road.

DoE's School Camp at Cape Peron
It is proposed to negotiate a lease with DoE for a portion of Reserve 48968, to provide greater security of tenure for the education camp.

Recreation Camps at Cape Peron
The land managed by DEC at Cape Peron contains eight short-stay recreation camps that are leased to private groups. Private lease-holders for the recreation camps at Cape Peron are as follows:

- Apex Holiday Centre Inc;
- Australian Post-Tel Institute (WA) Inc;
- L & S Recreation Centre Inc;
- Point Peron Aquatic Youth and Family Association;
- RSL Rockingham;
- Maritime Union of Australia (two leases); and
- Colin Ross Bullock on behalf of the Blinded Soldiers of St Dunstan's WA.

The recreation camps have a long history at Cape Peron. Many of them were relocated to the Cape from nearby areas as a result of urban development. The leases have been managed by DEC since 1999. Since 2003, the leases have been held over on short-term tenancies.

The proposed Mangles Bay Marina Tourist Precinct is one of a number of projects identified by the Rockingham - Kwinana Planning and Development Taskforce, which was formed to look at how the State government could support development in the south-west corridor of Perth and provide the necessary level of services and infrastructure.

As discussed in Section 7, the proposed Mangles Bay Marina Tourist Precinct would potentially involve significant changes to the environment and land uses of Cape Peron. The Mangles Bay Marina Tourist Precinct proponent and the EPA are supportive of a joint planning study of the balance of Cape Peron (including the recreation camps) involving the key stakeholders being undertaken in parallel with, but separately to, planning for the Mangles Bay Marina Tourist Precinct project (Environmental Protection Authority, 2006). The WAPC would be the appropriate agency to undertake the study.

Given the significant ramifications of the Mangles Bay Marina Tourist Precinct and its timing, the lessees of existing camps will be offered a new two-year lease term, from the gazettal of the Plan, for lease areas outside the 'Area Subject to Further Planning'. At the end of the two-year period, DEC will review the leases. Prior to any further tenure negotiations being instigated for leases that extend into the 'Area Subject to Further Planning' consultation will occur with the relevant State agencies associated with the Mangles Bay Marina Tourist Precinct project.

Lessees are advised that investments in the lease sites should be cognisant of lease terms, future tenure arrangements, and potential future development at Cape Peron.

There will be no new leases for recreation camps or private accommodation granted for vacated sites. The intention is to rehabilitate these areas and facilitate public access to vacated sites and the coast as appropriate.

Rockingham Volunteer Sea Rescue Group Inc.
The Rockingham Volunteer Sea Rescue Group leases a building on Reserve 39475, which is vested in the City of Rockingham. A day centre is located in the same building under a sub-lease.

Department of Transport boat shed lease
DoT leases an area of Reserve 39475, which is vested in the City of Rockingham. The leased area contains a boat shed which houses the Department's patrol boat.

Naval Association of Australia, Rockingham Subsection
The Naval Association of Australia, Rockingham Subsection leases a building on Reserve 39475, which is vested in the City of Rockingham. The building is used as a cadet training centre.

Naragebup Rockingham Regional Environment Centre Inc.
Naragebup Rockingham Regional Environment Centre is located on Safety Bay Road, and operates on a lease for Reserve 45307 that is vested in the City of Rockingham. Naragebup Rockingham Regional Environment Centre is a community built and managed not-for-profit organisation. The Centre plays a valuable role in providing information on the Park and surrounding region, as well as education resources. The Centre is also involved in environmental monitoring and rehabilitation, and coordinates some volunteer work in the Park.

Rockingham Golf Course
The Rockingham Golf Course is located on Reserve 38812 and it operates on a lease managed by the City of Rockingham. A management plan has been developed for the golf course.

Lakeside Deli
Lakeside Deli is located on Lot 11 Mandurah Road, east of Lake Walyungup. The leased premises include a small delicatessen and a caretaker's residence. The area is under short-term lease managed by DoP on behalf of the WAPC.

The appropriateness of Lakeside Deli has been reviewed during this planning process. A commercial concession at this site is considered appropriate given that it provides a service to Park visitors and the surrounding community.

On an interim basis the current lessee will be able to continue operating on existing lease terms and conditions. Once the lease has expired and the land is transferred to the Conservation Commission, expressions of interest will be sought in accordance with State government guidelines. Consultation will occur with the existing leaseholder during this process.

OPPORTUNITIES FOR NEW COMMERCIAL CONCESSIONS FOR VISITOR SERVICES

Accommodation at Cape Peron
Given Cape Peron's appeal as a holiday destination, and the existing lack of accommodation at the Cape available to the public, an opportunity may exist to develop low-key and/ or eco-tourism accommodation. The former Swan Brewery Social Club lease site may be a suitable location for this proposal as the area is already disturbed. Sensitive siting and design of chalets or a camping area would minimise impacts to surrounding areas. This proposal would need to consider the outcomes of planning for the Cape Peron headland as part of the Mangles Bay Marina Tourist Precinct.

If the proposal for low-key accommodation were to proceed, expressions of interest would be sought in accordance with government guidelines. A development concept plan and business plan would be required before the development could proceed.

Mobile food and bicycle hire outlets
Businesses such as ice cream vans, mobile food outlets or bicycle hire may operate in the Park, subject to the issuing of an appropriate licence by the managing agencies. Such activities must comply with the relevant managing agencies' requirements, including the City of Rockingham's health requirements.

Community and Special Events
There may be occasional requests for the use of areas of the Park for community and special events. The appropriateness of such events within the Park will be assessed by the managing agency controlling the respective area. A concession arrangement may be required between the event-organiser and the managing agency for the right to use a site and to cover the operational and administrative costs incurred by the managing agency.

The guiding principles for managing sustainable resource use are used by managing agencies as a means of determining the appropriateness of proposed activities. The City of Rockingham's planning, environmental health and other requirements must also be met.

CONCESSIONS FOR PURPOSES OTHER THAN VISITOR SERVICES

Commercial concessions for purposes other than visitor services are generally not considered appropriate within the Park unless there is a considerable benefit to the Park or they comprise a historical land use.

Residential leases
There is one residential lease within the Park at Lot 336 Mandurah Road, Baldivis. In the long term, residential leases are not considered appropriate within regional parks because they are on public open space that has been acquired by the WAPC for Parks and Recreation. However termination of the lease will consider individual circumstances.

There are caretaker residences attached to a number of leases that provide visitor services in the Park, including Lakeside Deli and the recreation camps at Cape Peron. These caretaker residences are considered necessary for managing the leases and are appropriate in the Park.

Telecommunications leases
It is likely that the managing agencies of the Park will be required to assess proposals for telecommunications facilities (such as mobile telephone towers) in the Park. When assessing such proposals, or managing telecommunications facilities, DEC is guided by *Radio/Tele Communications Facilities - Policy Statement No. 49*.

Beekeeping

DEC may grant permits to beekeepers to use Crown land under the CALM Act. Permits are granted on the provision that biodiversity and conservation objectives are not compromised, where the activity is compatible with other land uses. DEC's *Beekeeping on Public Land Policy Statement No. 41* provides that current apiary site permits will be maintained and renewed, but no additional permits will be granted on land reserved or proposed to be reserved primarily for conservation purposes, unless allowed for under a completed management plan.

The introduced honeybee (*Apis mellifera)* can have detrimental impacts on native insects, hollow-using animals and vegetation, as described in Section 23.

Given the high visitation to the Park and its proximity to residential areas no permits will be granted for beekeeping in the Park. Any existing non-registered beehives found in the Park will be removed in accordance with operational priorities.

Strategies

1. **Establish and manage any commercial operations on DEC-managed estate in accordance with DEC's *Recreation, Tourism and Visitor Services Policy Statement No 18*. Concessions in the Park may be permitted if they are consistent with the relevant reserve purpose. (DEC,) [Ongoing]**

2. **Ensure that any commercial concessions are consistent with the guiding principles for managing sustainable resource use, that conditions are fulfilled by concession holders, and that an appropriate fee is paid. (DEC, CoR) [Ongoing]**

3. **Seek expressions of interest for any commercial activities in the Park, in accordance with State or local government guidelines. (DEC, CoR) [Ongoing]**

4. **Where appropriate, allow for activities of community organisations and clubs that are consistent with the reserve purpose. (DEC, CoR) [Ongoing]**

5. **Offer two–year leases for the recreation camps at Cape Peron. At the end of two years, review the leases. (DEC) [Ongoing]**

6. **Conduct a feasibility study into the establishment low key eco-tourism accommodation at Cape Peron, pending planning for the area as part of the Mangles Bay Marina Tourist Precinct. (DEC) [Low]**

7. **Assess community and special events in relation to the guiding principles for sustainable resource use (DEC, CoR) [Ongoing]**

8. **Exclude beekeeping activities from the Park. (DEC) [Ongoing]**

40. Mining and the Extraction of Basic Raw Materials

The objective is to protect the Park's values from exploration, mining and the extraction of basic raw materials.

The Conservation Commission does not consider mining and the extraction of basic raw materials appropriate land uses in the Park, hence there is a presumption against these activities.

Mining has occurred in areas of the Park in the past at Lake Walyungup and Paganoni Swamp, however there are no longer any mining or extraction activities undertaken there.

EXTRACTION OF BASIC RAW MATERIALS

Depending on the land tenure involved there are different legislative requirements for extraction or mining of basic raw materials.

On freehold land, basic raw materials (including sand, limestone, limesand, clay, gravel and hard rock) are not defined as 'minerals' under the *Mining Act 1978* and commercial extraction is subject to extractive industry licences under the *Local Government Act 1995*. Any freehold property in the Park that is subject to an extractive industry licence will be processed under the *Local Government Act 1995*. For areas of the Park reserved for Parks and Recreation in the MRS, any extractive industry licence will be determined by WAPC.

Basic raw materials sought on reserves vested with the Conservation Commission or other Crown land will be processed under the *Mining Act 1978*.

Extraction of basic raw materials from within the Park is unlikely to be environmentally acceptable and such proposals will be referred to the EPA for assessment. The EPA will determine the level of assessment of any such proposal and depending on the level of assessment may make recommendations to the Minister for Environment.

MINING

Applications for mining within regional parks will be processed under the *Mining Act 1978*.

In processing applications, regional parks are recognised by the Department of Mines and Petroleum (DMP) under the '*Guidelines for Mineral Exploration and Mining within Conservation Reserves and Other Environmentally Sensitive Lands in Western Australia'* (Department of Minerals and Energy, 1998). Applications affecting the Park will also be subject to *The Mineral Exploration and Development Memorandum of Understanding* (MoU) between the EPA and DMP (Department of Minerals and Energy, 1995). The MoU clarifies referral arrangements for mineral exploration and mining proposals to the EPA and DEC where these proposals occur within conservation reserves and other environmentally sensitive lands.

Mineral exploration in national parks, class 'A' nature reserves, and class 'A' conservation parks (in the south-west of Western Australia) is subject to the concurrence of the Minister for Environment and the Minister for Mines and Petroleum. Approval for mining to occur in the Park is subject to EPA assessment. If mining was proposed in a class 'A' nature reserve or class 'A' conservation park, it would require EPA assessment and Parliamentary consent.

Strategies

1. **Ensure that any proposals for mining and extraction of basic raw materials affecting the Park are referred to the EPA (DEC) [Ongoing]**

2. **Review proposals for mining and extraction of basic raw materials with the view to excluding them from the Park. (DEC, CoR) [Ongoing]**

3. **Should proposals for mining or the extraction of basic raw materials be approved, ensure adequate provisions are made to manage impacts and to protect the remaining Park areas. (DEC, CoR) [Ongoing]**

41. Park Utilities and Services

The objective is to minimise the impact of public utilities in the Park, and provide cost-effective and safe park services.

UTILITIES AND SERVICES

Services such as electricity, water, sewerage and telecommunications are available at various locations in the Park. Future recreational, commercial, educational, or management facilities may require services at additional locations within the Park.

POWER SUPPLY INFRASTRUCTURE

To minimise the visual impact of power lines, it is advocated that all new power supply servicing Park facilities be placed underground. Mains power lines should be placed so there is minimal visual impact. Where feasible, power supplies servicing the Park should be from alternative renewable energy sources, for example solar power.

WATER SUPPLY INFRASTRUCTURE

A Water Corporation reservoir is located at Tamworth Hill. A chlorination buffer exists around the area, for a chlorination plant that is located immediately outside of the Park boundary. The chlorination buffer has restricted access under the MRS, and the area is fenced accordingly. The Water Corporation plans to extend the Tamworth Hill reservoir in the future, however all works would be kept inside the Water Corporation's reserve. The Water Corporation is to be notified of any planned developments or works that will affect the reservoir and its buffer, and approval is to be gained prior to the commencement of works.

The Water Corporation is also considering plans to develop water supply or wastewater infrastructure on land it owns at Lark Hill. There may be an opportunity to design such development to minimise any impact on the corridor and maximise the value of the link between the Port Kennedy and Lake Walyungup estates of the Park.

WASTEWATER TREATMENT INFRASTRUCTURE

A wastewater treatment plant is located at Cape Peron. The facility is expected to continue operation for at least the next ten to fifteen years, depending on the establishment of a wastewater treatment plant in East Rockingham. The Water Corporation is to be notified of any planned developments or works that will affect the Cape Peron wastewater treatment plant, and approval from the Water Corporation is required prior to the commencement of works.

The former Port Kennedy wastewater treatment plant at Lark Hill has been decommissioned. The Water Corporation remains the owner of the land, and there are proposals to develop water supply or wastewater infrastructure there in the future.

STORMWATER FACILITIES AND DRAINAGE OUTLETS

Stormwater drainage outlets are located at Lake Richmond. These are the responsibility of the Water Corporation and the City of Rockingham. The drains divert stormwater and surface water runoff from the surrounding catchment into the wetland. The Water Corporation and Naragebup Rockingham Regional Environment Centre have undertaken monitoring of Lake Richmond. The main issues associated with drainage entering Lake Richmond are discussed in Section 17.

All new developments adjoining the Park will be required to dispose of stormwater appropriately within the development site. No additional direct drainage outfalls will be permitted in the Park. In the longer term, existing stormwater outfalls will be reviewed to assess the viability of improving the quality of water entering the Park.

Drainage outlets may be unattractive and efforts should be made to blend them with the natural surroundings, for instance by battering walls and planting the sides with vegetation. Planting of vegetation needs to be managed to ensure the drain remains functional.

PARKLAND SERVICING AND MAINTENANCE

Parkland and recreational areas need regular maintenance, which is the responsibility of the managing agency that controls each area. The collection of rubbish, maintenance and provision of toilet facilities, and general maintenance operations within the Park requires regular management access.

Existing and proposed toilets within the Park are illustrated in the Recreation Masterplan (Appendix A).

The provision of bins will be minimised and visitors are encouraged to take their rubbish home. The dumping of rubbish has been a management issue in some areas of the Park. This requires the enforcement of relevant Local Laws or the application of CALM Act and associated regulations relating to rubbish dumping.

Strategies

1. **Where appropriate, ensure that a detailed environmental management and rehabilitation programme accompanies service works that occur in the Park. (DEC, CoR) [Ongoing]**

2. **Ensure that any new power lines for Park services are placed underground to improve the aesthetics of the Park. (DEC, CoR) [Low].**

3. **Liaise with the City of Rockingham and the Water Corporation to upgrade existing drainage facilities to improve the quality of water entering the Park and to improve the aesthetics of the outlets. (DEC) [High]**

4. **Liaise with the DoW and DoP to prevent the construction of additional stormwater drainage outlets in the Park. (CoR, DEC) [Ongoing]**

5. **Ensure that existing or proposed toilets within the Park are connected to sewer outlets or other environmentally acceptable disposal units. (DEC, CoR) [Ongoing]**

6. **Promote 'take it home' rubbish education. (DEC, CoR) [Medium]**

42. Development Proposals Affecting the Park

The objective is to prevent or at least minimise the impact of developments on the values of the Park.

It is important that the Park's managing agencies liaise with service providers and development proponents to avoid or at least limit disturbance in the Park. Additionally, there should be no physical impacts, either during or post construction, to the lands or waters that comprise the Park, from developments that adjoin the Park. This can be achieved by ensuring that appropriate conditions are placed on the proponent of developments when they are seeking planning approvals.

Where service corridors are required within the Park, they should be rationalised by combining utility requirements.

Major infrastructure developments adjoining or affecting the Park include the proposed Fremantle-Rockingham Controlled Access Highway, the proposed Garden Island Highway and a proposed second access road to the Woodbridge Estate and Rockingham Kwinana District Hospital (near the western boundary of the Park at Lake Cooloongup from Elanora Drive to Dixon Road).

Major developments adjoining or affecting the Park at the time of writing include the Lark Hill Regional Sporting and Equestrian Complex, the Kennedy Bay development and the proposed Mangles Bay Marina Tourist Precinct.

Additionally, the *Southern Metropolitan and Peel Sub Regional Structure Plan* released for public comment by the WAPC in June 2009 proposes to rezone 48 hectares of Paganoni Swamp in the Metropolitan Region Scheme from Parks and Recreation to Urban. This would effectively remove the 48 hectares from Rockingham Lakes Regional Park.

Strategies

1. **Request that appropriate conditions (which help protect the values of the Park) are placed on the proponents of developments during planning and environmental approvals processes. (DEC, CoR) [Ongoing]**

2. **Liaise with the Commonwealth Department of the Environment, Water, Heritage and the Arts to ensure that proposals are referred under the EPBC Act 1999 where appropriate. (DEC, CoR) [Ongoing]**

3. **Ensure that planning and management of the Park and the Lark Hill Regional Sporting and Equestrian Complex is integrated. (DEC, CoR) [Ongoing]**

4. **Liaise with the proponent of the Kennedy Bay development and DoP to ensure that Ministerial conditions and proponent commitments relating to Port Kennedy Scientific Park are met appropriately. (DEC) [High]**

G. WORKING WITH THE COMMUNITY

43. Guiding Principles for Working with the Community

1. Community participation
The community is encouraged to have input into the planning and management of the Park. Public participation processes will have a clearly stated purpose and clearly identified boundaries. Participation is to be based on ensuring a shared understanding (with stakeholders) of objectives, responsibilities, behaviour and expected outcomes. The participatory process will be objective, open, fair and carried out in a responsible and accountable manner. Participation will provide opportunities for input, representation and joint learning from all relevant stakeholders.

2. Information exchange
Information regarding the planning and management of the Park will be exchanged between land managers and the community in an open and transparent manner. Data and information used in the decision-making process will be available to stakeholders. Public participation processes will emphasise the sharing of information, joint learning and understanding.

3. Outcomes and decision-making
The outcomes of public participation form part of the decision-making process. Participants should be informed as to how their involvement affected DEC's or the State government's decisions.

4. Management objectives
The community will be encouraged to contribute to the achievement of nature conservation and land management objectives, including those outlined in this Plan. This will help to build community awareness, understanding and commitment to these objectives.

5. Education and interpretation
Education and interpretation will be aimed at giving visitors a 'take home' message that will create an awareness of the Park's values and management issues, and positively influence visitor behaviour. It will also provide information on the reasons behind management decisions and will convey the objectives of this Plan. Education and interpretation will encourage community involvement in and ownership of the Park.

Strategy

1. **Apply the above principles in working with the community to manage the Park. (DEC, CoR) [Ongoing]**

44. Community Involvement

The objective is to facilitate community involvement in the management of the Park.

ROCKINGHAM LAKES REGIONAL PARK COMMUNITY ADVISORY COMMITTEE

The Rockingham Lakes Regional Park Community Advisory Committee provides a forum at which issues affecting the Park are discussed. The committee, which was established in February 1999, consists of community members, and representatives from DEC and the City of Rockingham. The committee's role is to assist in implementing this Plan and subsidiary plans for the Park and to provide advice regarding to the ongoing management of the Park. The Community Advisory Committee's role, composition and structure will be reviewed periodically.

Information on community groups involved in the Park can be obtained from the managing agencies. Contact details are provided in Appendix E.

Where an issue in the Park has a significant impact on a specific user group, DEC will consult with that group as well as with the Rockingham Lakes Regional Park Community Advisory Committee.

COMMUNITY INVOLVEMENT IN IMPLEMENTING THIS PLAN

The community is encouraged to be involved in implementing this Plan as well as in future planning and management projects. This will help to develop a sense of community ownership of, and value in the Park

To facilitate community involvement in the Park, DEC has prepared a Regional Park Volunteer Information Package. When consulting with the community on issues regarding the Park, DEC is guided by *Community Involvement (Public*

Participation and Volunteers) Policy Statement No. 15.

Residents who live in close proximity to the Park can have a great impact on the Park, both positive and negative. It is important to seek the cooperation and involvement of nearby landowners to protect the values of the Park. This can be done through educational programmes, which promote responsible use of the Park and inform the community of management roles and responsibilities.

There are several different ways that members of the public can be involved in assisting with the implementation of this Plan including:

- joining community volunteer groups such as Naragebup Rockingham Regional Environment Centre Inc;
- joining DEC's schools-based 'Bush Rangers' Programme;
- contacting members of the Rockingham Lakes Regional Park Community Advisory Committee;
- reporting problems and issues to the managing agencies; and
- being involved in clean-up days (e.g. Clean-up Australia Day) or rehabilitation planting.

Strategies

1. **Consult with the Rockingham Lakes Regional Park Community Advisory Committee in implementing this Plan. (DEC) [Ongoing]**

2. **Periodically review the role and composition of the Rockingham Lakes Regional Park Community Advisory Committee. (DEC) [Ongoing]**

3. **Provide opportunities for the community to be involved in developing subsidiary plans for the Park. (DEC, CoR) [Ongoing]**

4. **Maintain active liaison with community groups involved in the Park (DEC, CoR) [Ongoing]**

5. **Encourage and support the activities of volunteers, community groups, schools and associations interested in the Park. (DEC, CoR) [Ongoing]**

6. **Coordinate the activities of volunteers in the Park in liaison with community groups. (DEC, CoR) [Ongoing]**

7. **Facilitate community involvement in the Park by implementing the Regional Parks Volunteer Information Package. (DEC) [Ongoing]**

8. **Inform the community and other organisations of management actions, programmes and developments within the Park. (DEC, CoR) [Ongoing]**

Key performance indicators for community involvement
The success of these strategies will be measured by: 1. Change in volunteer hours contributed to the management of the Park. 2. Existence of an active community advisory committee.
Target: 1. No decrease in volunteer hours contributed to the management of the Park. 2. Maintenance of an active community advisory committee for the Park.
Reporting: 1. Every 5 years. 2. Every 5 years.

45. Information, Interpretation and Education

The objectives are to increase the community's awareness, appreciation and understanding of the Park's values and management practices and to involve the community in implementing this Plan.

An effective communication programme is essential to achieve the objectives of this Plan. It informs the public of attractions, facilities and recreation opportunities available within the Park and provides an avenue to promote an appreciation and greater understanding of the natural environment. Additionally, it fosters appropriate behaviour so that adverse impacts on the environment are minimised.

A communication plan for regional parks in Perth has been completed by DEC. The communication plan and programme has three integrated parts:

- information – providing an overview of recreation opportunities and details of facilities, activities and regulations;
- interpretation – explaining natural and cultural features; and
- education – providing detailed materials and programmes designed to facilitate learning, focussing on target groups (e.g. school groups, community groups).

The communication programme is being implemented by way of signs, displays, publications (such as brochures and Park notes), and guided activities.

An interpretation plan will also be completed for Rockingham Lakes Regional Park. This plan will outline how information is provided to visitors to help them plan their visit, enjoy and appreciate the Park's values and assist them to recall their experience when they depart. The Park offers many opportunities for developing an enriching body of interpretive material.

Key areas for interpretation and education include:

- flora and fauna;
- threatened ecological community of thrombolites at Lake Richmond;
- threatened ecological community of sedgelands in Holocene dune swales;
- coastal environment of Cape Peron and interaction with the adjoining Shoalwater Islands Marine Park;
- geomorphic evolution and significance of the Rockingham-Becher Plain and the Ramsar listed wetlands;
- cultural influences (both Aboriginal and non-Aboriginal);
- recreation opportunities;
- the regional park entity, its management and evolution; and
- caring for the Park and using it responsibly.

The development of interpretive material should be undertaken in a coordinated way to ensure the most effective use of available resources and to present a well integrated, consistent body of information about the Park.

Involvement of the community in Park operations, ongoing liaison with community groups and the provision of interpretive and educational materials will be important for maintaining the values of the Park and to maximise its use as an educational resource.

Existing Park Information, Interpretation and Education

Information and interpretive material is available at Naragebup Rockingham Regional Environment Centre and Lake Richmond including information on thrombolites, wetland flora, fauna and wetland ecology.

The Park is fortunate to have the resources of the Naragebup Rockingham Regional Environment Centre established near Lake Richmond. The mission statement of the Centre is 'to provide constructive, integrated and educational programmes which promote the benefits of managing the environment to sustain quality of life'. The Centre provides information on the Park and surrounding region, as well as education resources. It has strong community support. The role of the Naragebup Rockingham Regional Environment Centre will be included in the information, interpretation and education programme for the Park.

At Port Kennedy, information is available on coastal dune formation, threatened and uncommon species and habitats, the international significance of the wetlands, coastal wildlife, and feral animal control.

DEC will develop further opportunities for Park information to be presented, consistent with the communication plan for regional parks and the interpretation plan for Rockingham Lakes Regional Park.

Strategies

1. **Implement and periodically update the Regional Parks Communication Plan. The plan provides direction on:**
   - **community education;**
   - **community involvement; and**
   - **interpretive strategies and techniques.**

   (DEC, CoR) [High]

2. **Develop and implement an interpretation plan for Rockingham Lakes Regional Park. (DEC, CoR) [High]**

3. **Continue to liaise with interest groups to ensure a coordinated approach to information provision, interpretation and education in the Park. (DEC, CoR) [Ongoing]**

4. **Continue to support the Naragebup Rockingham Regional Environment Centre and its role in providing information and education resources. (CoR, DEC) [Ongoing]**

H. IMPLEMENTING AND EVALUATING THE PLAN

46. Priorities, Funding and Staff

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

PRIORITIES AND TIMELINES

The priorities for managing the Park have been established by the managers of the Park and appear in brackets behind each strategy in the Plan. They represent the priorities at the time of writing and will be reviewed in reference to changing circumstances during the term of the Plan. There are many strategies outlined in this Plan. Some are guidelines, and others are prescriptions for specific actions. The City of Rockingham and DEC will implement this Plan within the framework of available resources.

Subsidiary plans and implementation programmes
In implementing this Plan, more detailed subsidiary plans will be prepared prior to significant works taking place within the Park (Figure 1).

Subsidiary plans to be (or that have been) prepared as part of the Rockingham Lakes Regional Park planning process include:

- Weed Control Rehabilitation Plan (Section 21 and Section 24);
- Fire Response Plan (Section 22);
- Regional Parks Pest and Problem Animal Control Plan (Section 23);
- Visitor Survey Programme (Section 31);
- Recreation Masterplan (Section 32);
- Site Enhancement Plans for specific areas of the Park (Section 33);
- Sign System and Sign Plan (Section 36);
- Visitor Risk Management Programme (Section 37);
- Communication Plan for Regional Parks (Section 45);
- Interpretation Plan (Section 45) and
- Volunteer Information Package (Section 44).

An annual projects list will be prepared by DEC to guide the implementation of the Plan in the areas of the Park vested with the Conservation Commission. The City of Rockingham and the Rockingham Lakes Regional Park Community Advisory Committee will be consulted by DEC in the preparation of the annual projects list.

STAFFING

The City of Rockingham manages Council reserves within the Park using staff from the Engineering and Park Services Division and the Planning and Development Services Division, and contractors as required. DEC services its management obligations with staff from the Community and Regional Parks Branch, and with contractors as required.

FUNDING ARRANGEMENTS

The City of Rockingham and DEC will finance and manage their respective land areas (Figure 4). DEC has been

allocated a recurrent budget for the maintenance of regional parks from the Treasury. Funding for the acquisition of private property proposed for inclusion in the Park rests with the WAPC.

Strategies

1. **Prepare and implement an annual projects list, taking into account the priorities identified in this Plan. Consult with the City of Rockingham and the Rockingham Lakes Regional Park Community Advisory Committee when preparing the list. (DEC, CoR) [High]**

2. **Seek corporate sponsorship opportunities and other funding arrangements to contribute to Park management where appropriate. (DEC, CoR) [Ongoing]**

47. Term of the Plan

This Plan will guide the management of the Park for a period of ten years from the date it is gazetted. During this time, amendments are allowed under Section 61 of the CALM Act. If an amendment is necessary, the proposed changes will be released for public comment.

At the end of the ten-year period, this Plan may be reviewed and a new management plan prepared. The new management planning process requires full public consultation and approval from the Minister for Environment. If the plan is not reviewed and replaced by the end of the 10-year period, Section 55(2) of the CALM Act allows the plan to remain in force in its original form, unless it is either revoked by the Minister or until a new plan is approved.

48. Performance Assessment

The Conservation Commission will measure the success of this Plan in accordance with its performance assessment function under Section 19(1)(g)(iii) of the CALM Act by using performance indicators and other mechanisms as appropriate.

It is not efficient to measure all aspects of management given resource and technical impediments, so indicators will target 'key' components of the plan. KPIs are identified in relevant sections throughout the Plan and are also presented in a summary in Table 3. Each KPI comprises evaluation of a measure, target and reporting requirements.

DEC is responsible for providing information to the Conservation Commission to allow it to assess the performance of DEC in carrying out and complying with this Plan.

The frequency of reporting will depend upon the requirements of each KPI, the establishment of baseline information against which to assess performance, and any unforeseen changes to the environmental conditions. Where a report identifies a target shortfall, a response to the Conservation Commission may be required. The response may identify factors that have led to the target shortfall, and propose alternative management where appropriate. The Conservation Commission will consider DEC's response on the target shortfall and evaluate the need for action. The Conservation Commission will make the results of performance assessments available to the public.

The adequacy of the range of selected KPIs and management strategies will be reviewed following each performance assessment.

DEC will undertake a review of the implementation of management plan in preparing an annual projects list for the Park. The Rockingham Lakes Regional Park Community Advisory Committee will be involved in reviewing the annual projects list.

Strategies

1. **Audit the overall effectiveness of the Park's management based on the KPIs (Table 3). (Conservation Commission) [Ongoing]**

2. **Review the implementation of this Plan annually in preparing an annual projects list. (DEC) [Ongoing]**

Table 3 - Performance Assessment

KEY VALUES	KEY OBJECTIVE	KEY PERFORMANCE INDICATORS		
		Performance Measure	**Target**	**Timelines & Reporting Requirements**
The Park's conservation, recreation and landscape values.	Section 8. Land Tenure To ensure that the values of the Park are protected by security of tenure and reserve purpose.	1. Tenure actions for which DEC and the Conservation Commission are responsible.	1. Complete all land tenure changes for which DEC and the Conservation Commission are responsible.	1. Every 5 years.
Vegetation communities in the Park are representative of communities once widespread on the Swan Coastal Plain but now significantly decreased in distribution and condition.	Section 18. Flora and Vegetation To protect, conserve and rehabilitate local flora species and vegetation communities in the Park.	1. Changes in the abundance of selected flora species. 2. Existence of a weed control and rehabilitation plan.	1. No decline in the abundance of selected flora species from 2006 levels. 2. Implementation of the weed control and rehabilitation plan.	1. Every 5 years. 2. Every 5 years.
The presence of two 'critically endangered' threatened ecological communities, one of which is associated with a Ramsar site.	Section 19. Threatened Ecological Communities To protect and enhance the threatened ecological communities within the Park.	1. Changes in the condition of the threatened ecological communities.	1. No decline in the condition of the threatened ecological communities.	1. Every 5 years.
The diverse coastal, wetland and upland habitats of Rockingham Lakes support a variety of indigenous fauna species.	Section 20. Fauna To protect and conserve naturally-occurring fauna species in the Park, particularly threatened and priority species.	1. Changes in species diversity of naturally-occurring fauna. 2. Changes in the abundance of selected naturally-occurring fauna species.	1. No decline in species diversity of naturally-occurring fauna. 2. No decline in the abundance of selected naturally-occurring fauna species.	1. Every 5 years. 2. Every 5 years.

Continued over page…

Table 3 – Performance Assessment (continued)

KEY VALUES	KEY OBJECTIVE	KEY PERFORMANCE INDICATORS		
		Performance Measure	**Target**	**Timelines & Reporting Requirements**
Vegetation communities in the Park are representative of communities once widespread on the Swan Coastal Plain but now significantly decreased in distribution and condition.	Section 21. Weeds To minimise the impact of environmental weeds on the local plant species and communities within the Park.	1. Changes in populations of high priority weeds as identified in the *Environmental Weeds Strategy for Western Australia.* 2. Changes in the abundance and distribution of priority environmental weeds, as identified in the Park's weed control and rehabilitation plan. 3. Existence of a weed control and rehabilitation plan.	1. No new populations of high priority weeds as identified in the *Environmental Weeds Strategy for Western Australia* over the next ten years. 2. No increase in the abundance and distribution of priority environmental weeds. 3. Implementation of the weed control and rehabilitation plan.	1. Every 5 years. 2. Every 5 years. 3. Every 5 years.
Rockingham Lakes has a diversity of settings which provides for a range of recreational opportunities in close proximity to urban areas.	Section 31. Visitor use To encourage visitor use whilst ensuring that the level of use and behaviour are sustainable and minimise conflict with other Park visitors and values.	1. Changes in visitor numbers and satisfaction levels. 2. Provision of formalised access in the Park (as per Section 32 – Recreation Masterplan). 3. Existence of a visitor survey programme.	1. No decline in visitor satisfaction. 2. Complete access and circulation components of the Recreation Masterplan. 3. Approval of a visitor survey programme.	1. Every 5 years. 2. Every 5 years. 3. Every 5 years.
The Park is a community asset.	Section 44. Community Involvement To facilitate community involvement in the management of the Park.	1. Change in volunteer hours contributed to the management of the Park. 2. Existence of an active community advisory committee.	1. No decrease in volunteer hours contributed to the management of the Park. 2. Maintenance of an active community advisory committee for the Park.	1. Every 5 years. 2. Every 5 years.

Note: The response to target shortfalls will be to investigate the cause and report to the Conservation Commission for action.

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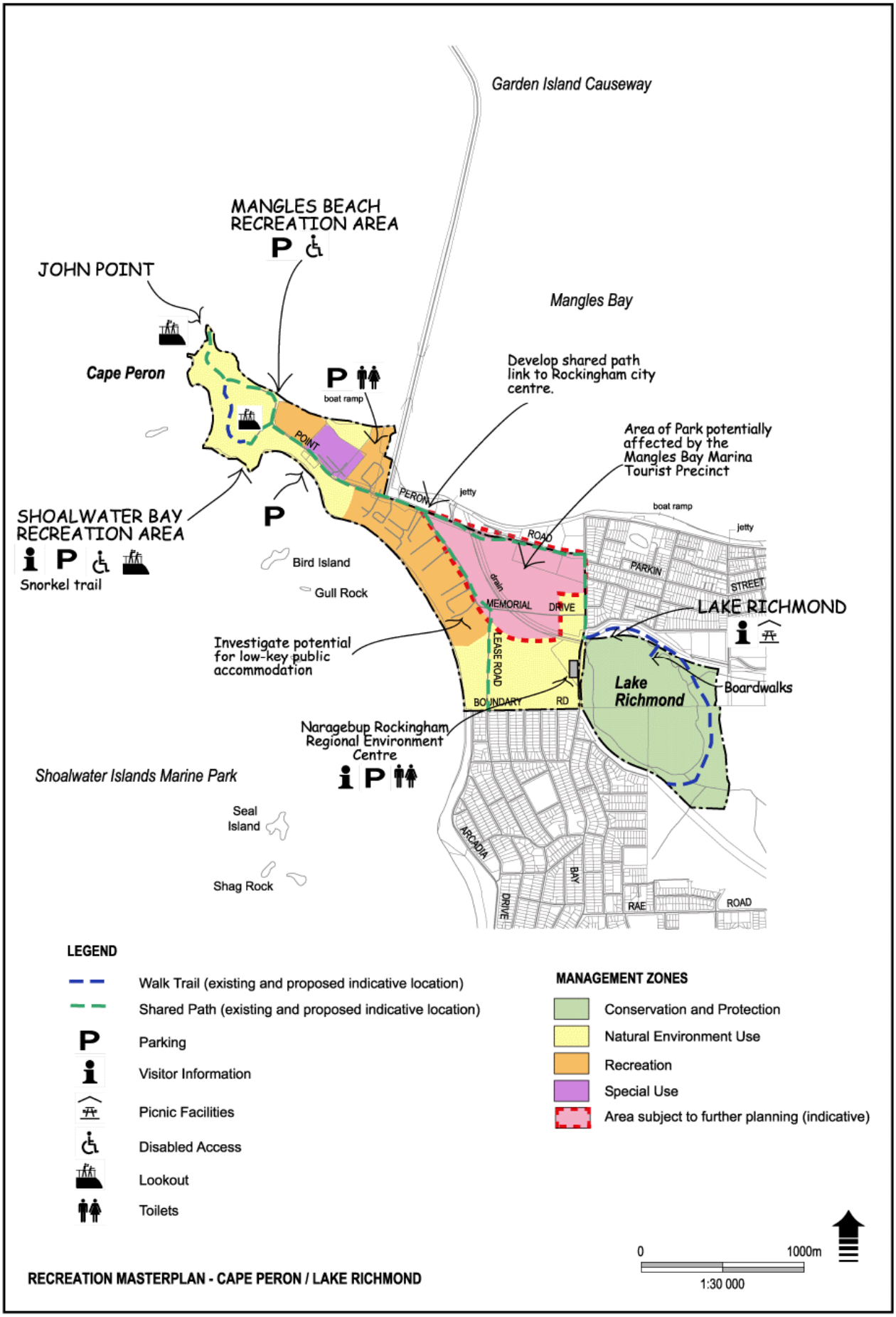
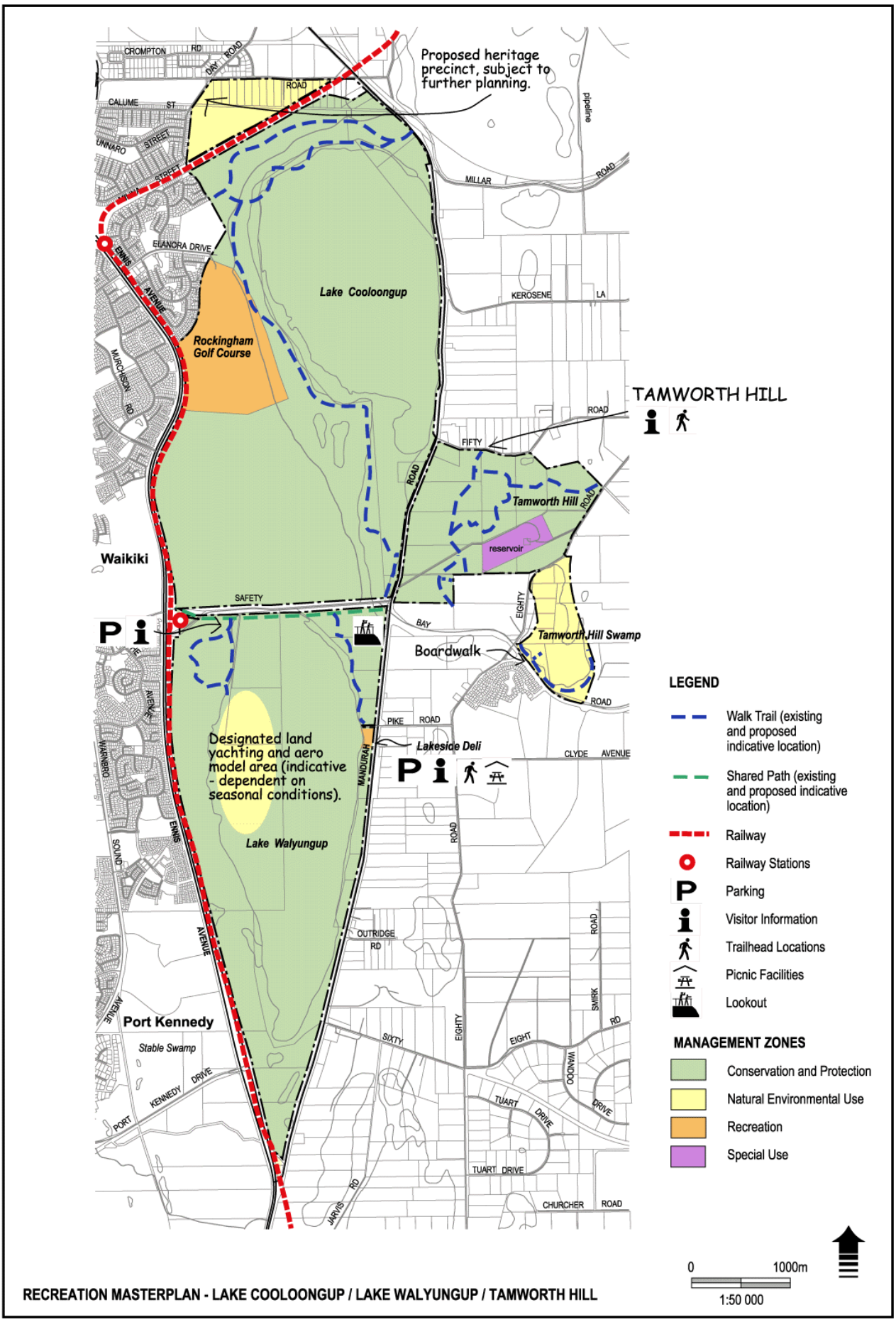
Appendix A - Recreation Masterplan




Proposed heritage precinct, subject to further planning.
Lake Cooloongup
Rockingham Golf Course
TAMWORTH HILL
Tamworth Hill
reservoir
Tamworth Hill Swamp
Waikiki
Boardwalk
Lakeside Deli
Designated land yachting and aero model area (indicative - dependent on seasonal conditions).
Lake Walyungup
Port Kennedy
Stable Swamp
CROMPTON RD
CALUME ST
UNNARO STREET
ELANORA DRIVE
ENNIS AVENUE
MURCHISON RD
MILLAR ROAD
KEROSENE LA
FIFTY ROAD
SAFETY BAY
EIGHTY ROAD
PIKE ROAD
CLYDE AVENUE
MANDURAH
OUTRIDGE RD
SIXTY
EIGHT
TUART DRIVE
CHURCHER ROAD
JARVIS RD
SMIRK RD
WANDOO DRIVE
PORT KENNEDY DRIVE
WARNBRO SOUND AVENUE
LEGEND
Walk Trail (existing and proposed indicative location)
Shared Path (existing and proposed indicative location)
Railway
Railway Stations
Parking
Visitor Information
Trailhead Locations
Picnic Facilities
Lookout
MANAGEMENT ZONES
Conservation and Protection
Natural Environmental Use
Recreation
Special Use
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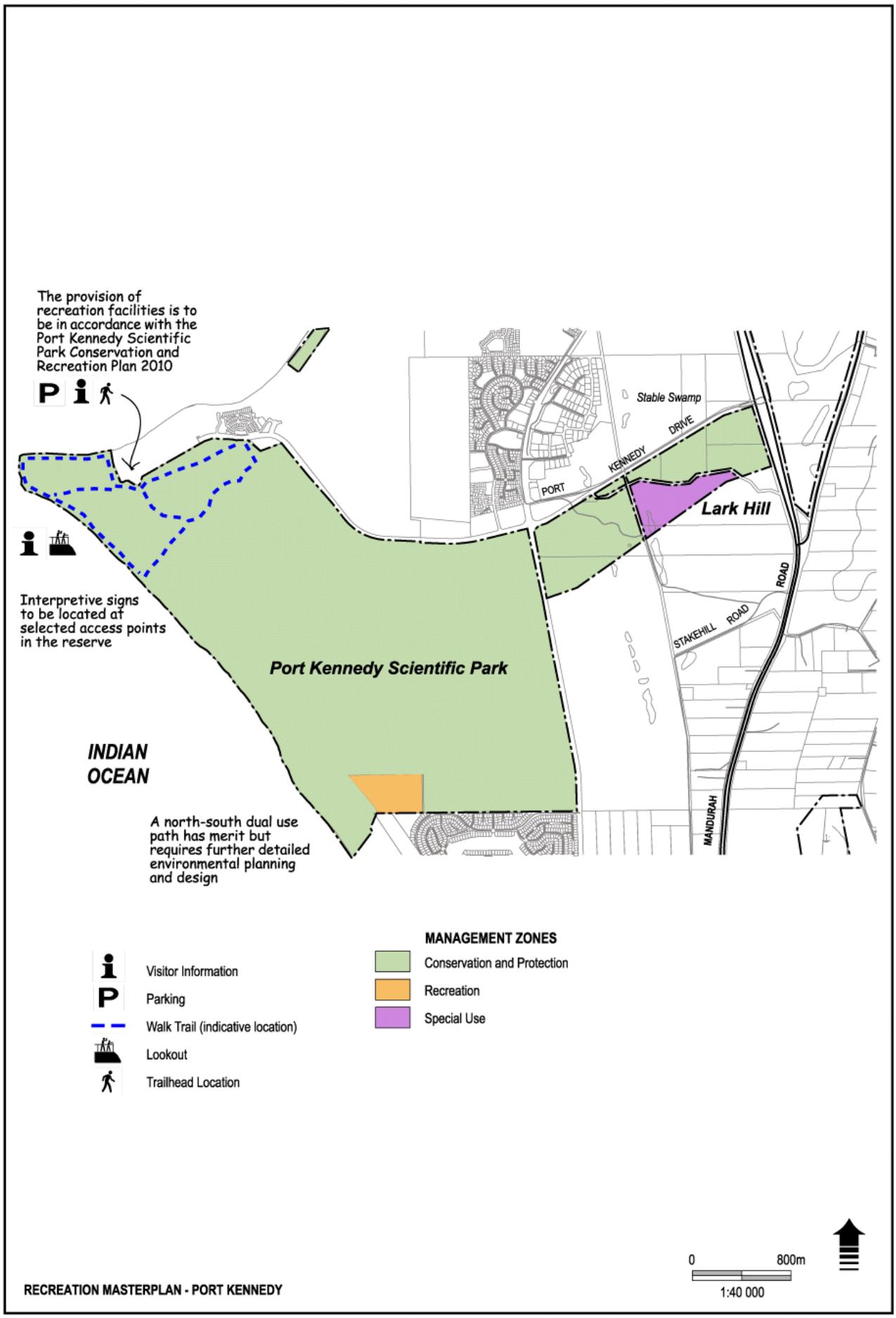
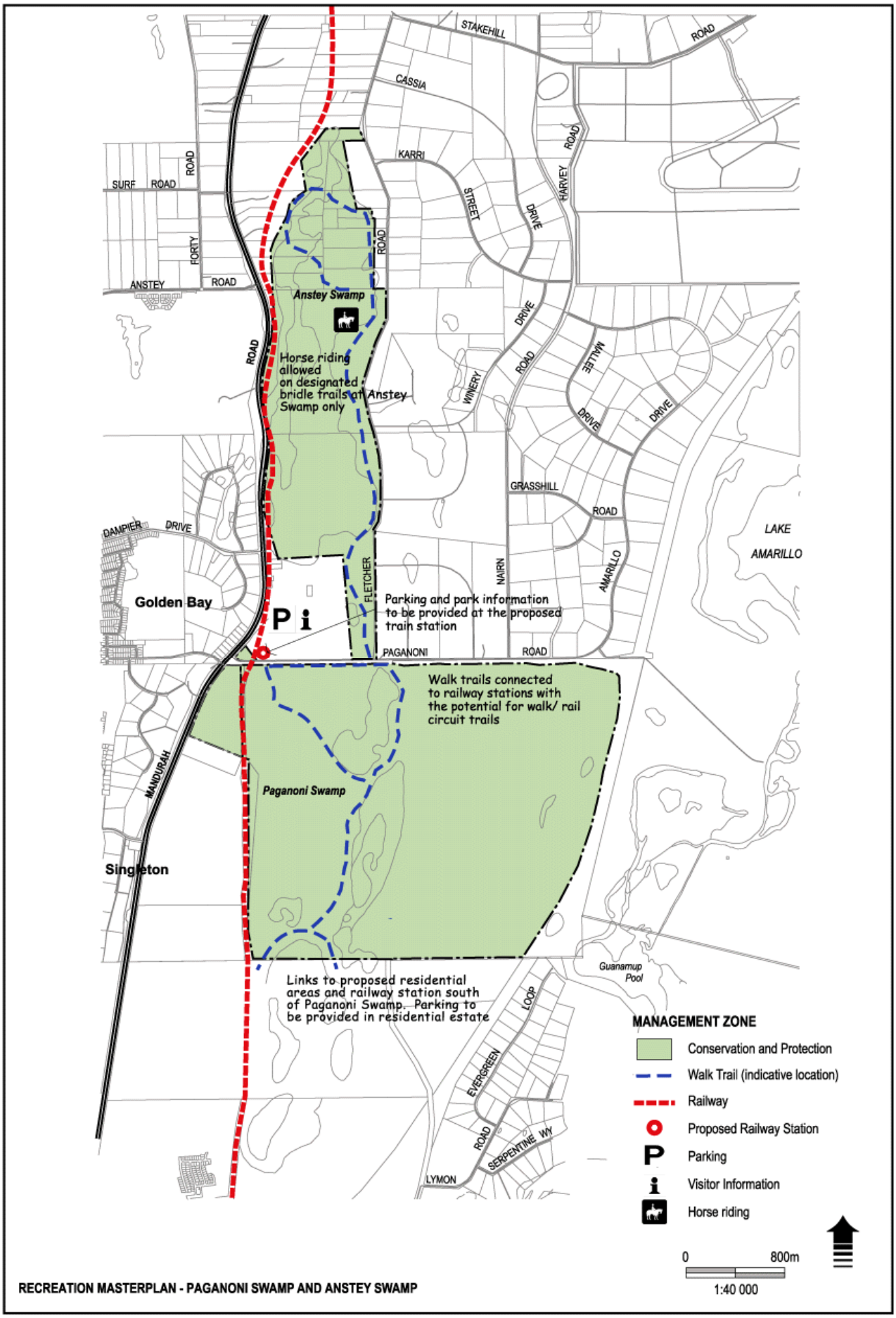
RECREATION MASTERPLAN - LAKE COOLOONGUP / LAKE WALYUNGUP / TAMWORTH HILL


The provision of recreation facilities is to be in accordance with the Port Kennedy Scientific Park Conservation and Recreation Plan 2010
Interpretive signs to be located at selected access points in the reserve
Port Kennedy Scientific Park
INDIAN OCEAN
A north-south dual use path has merit but requires further detailed environmental planning and design
Stable Swamp
PORT KENNEDY DRIVE
Lark Hill
STAKEHILL ROAD
MANDURAH ROAD
Visitor Information
Parking
Walk Trail (indicative location)
Lookout
Trailhead Location
MANAGEMENT ZONES
Conservation and Protection
Recreation
Special Use
0
800m
1:40 000
RECREATION MASTERPLAN - PORT KENNEDY


STAKEHILL
ROAD
CASSIA
KARRI
STREET
DRIVE
HARVEY
ROAD
SURF
ROAD
ROAD
FORTY
ANSTEY
ROAD
ROAD
Anstey Swamp
Horse riding allowed on designated bridle trails at Anstey Swamp only
ROAD
DRIVE
ROAD
WINERY
MALLEE
DRIVE
DRIVE
GRASSHILL
ROAD
LAKE AMARILLO
DAMPIER
DRIVE
Golden Bay
FLETCHER
NAIRN
AMARILLO
Parking and park information to be provided at the proposed train station
PAGANONI
ROAD
Walk trails connected to railway stations with the potential for walk/ rail circuit trails
MANDURAH
Paganoni Swamp
Singleton
Guanamup Pool
Links to proposed residential areas and railway station south of Paganoni Swamp. Parking to be provided in residential estate
LOOP
EVERGREEN
ROAD
SERPENTINE WY
LYMON
MANAGEMENT ZONE
Conservation and Protection
Walk Trail (indicative location)
Railway
Proposed Railway Station
Parking
Visitor Information
Horse riding
0
800m
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RECREATION MASTERPLAN - PAGANONI SWAMP AND ANSTEY SWAMP

Appendix B - DEC policies referred to in this Plan

Rehabilitation of Disturbed Land, Policy Statement No. 10

Community Involvement (Public Participation and Volunteers), Policy Statement No. 15

Recreation, Tourism and Visitor Services, Policy Statement No. 18

Fire Management Policy, Policy Statement No. 19

Beekeeping on Public Land, Policy Statement No. 41

Radio/ Tele Communications Facilities, Policy Statement No. 49 [review in preparation]

Visitor Risk Management, Policy Statement No. 53

Conservation of Threatened Flora in the Wild, Policy Statement No. 9

Proposed Environmental Weed Management Policy [subject to final consultation]

Proposed Management of Pest Animals on DEC-Managed Lands [subject to final consultation]

Appendix C - Acronyms used in the Plan

DEC	Department of Environment and Conservation
CALM Act	Conservation and Land Management Act 1994
Conservation Commission	Conservation Commission of Western Australia
CoR	City of Rockingham
DoE	Department of Education
DIA	Department of Indigenous Affairs
DMP	Department of Mines and Petroleum
DoP	Department of Planning
DRDL	Department of Regional Development and Land
DoT	Department of Transport
DoW	Department of Water
EPA	Environmental Protection Authority
FESA	Fire and Emergency Services Authority
KPI	Key Performance Indicator
MoU	Memorandum of Understanding
MRS	Metropolitan Region Scheme
UXO	Unexploded Ordnance
WAPC	Western Australian Planning Commission

Appendix D - Glossary

Class 'A' Reserves	Under Section 42 of the *Land Administration Act 1997*, the Minister for Lands may by order classify a reserve as a class 'A' reserve, for one or more purposes in the public interest. The Act outlines special procedures that apply to certain changes to class 'A' reserves and conservation reserves. (*Land Administration Act 1997*, Sections 41, 42 and 43)
Declared Rare Flora	Declared Rare Flora describes threatened flora; plant species that are declared rare under Section 23F of the *Wildlife Conservation Act 1950* as flora likely to become extinct or which are rare or otherwise in need of special protection. To be declared rare, plant species must meet well-defined criteria, which include the thoroughness of searches for the species, its rarity and the danger of extinction. A number of criteria are used to define Declared Rare Flora. These are related to the taxon being well defined and readily identifiable and the extent to which the taxon's distribution in the wild has been recently determined by competent botanists. The status of a threatened plant in cultivation has no bearing on the matter.
Fauna 'Specially Protected' under the *Wildlife Conservation Act 1950*	Under the *Wildlife Conservation Act 1950* the Minister for Environment may declare species of fauna to be 'Specially Protected' if they are likely to become extinct, or are rare, or are birds protected under and international agreement, or are otherwise in need of special protection. These species are considered threatened fauna and receive special consideration in management by DEC.
High Water Mark	In relation to tidal waters, means ordinary high water mark at spring tides. (*Land Administration Act 1997, Section 3*)
Holocene	The geological time period extending from about 10,000 years ago until present.
Matters of National Environmental Significance	The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999) recognises and provides protection for matters of national environmental significance. The Act identifies seven matters of national environmental significance: ▪ World Heritage properties; ▪ national heritage places; ▪ wetlands of international importance (Ramsar sites); ▪ threatened species and ecological communities; ▪ migratory species; ▪ Commonwealth marine areas; and ▪ nuclear actions.
Priority Fauna Listings	DEC maintains a list of Priority Fauna. Taxa may be assigned one of five categories, as follows: Priority One: – Taxa with few, poorly known populations on threatened lands. Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna. Priority Two: – Taxa with few, poorly known populations on conservation lands. Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna. Priority Three: – Taxa with several, poorly known populations, some on conservation lands. Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna. Priority Four: – Taxa in need of monitoring. Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could if present circumstances change. These taxa are usually represented on conservation lands.

	Priority Five: - Taxa in need of monitoring. Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.
Priority Flora Listings	DEC maintains a list of Priority Flora. Taxa may be assigned one of four categories, as follows: Priority One – Poorly known: taxa which are known from one or a few (generally less than five) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey. Priority Two – Poorly known: taxa which are known from one or a few (generally less than five) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora' but are in urgent need of further survey. Priority Three: – Poorly known: taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey. Priority Four: – Rare: taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5 – 10 years.
Threatened Ecological Community	DEC has developed a procedure for identifying 'threatened ecological communities'. Ecological communities are defined as 'naturally occurring biological assemblages that occur in a particular type of habitat'. Threatened ecological communities are those that have been assessed and assigned to one of four categories related to the status of the threat to the community. The categories are: ▪ presumed totally destroyed; ▪ critically endangered; ▪ endangered; ▪ vulnerable. The threatened ecological communities in Rockingham Lakes Regional Park are all assigned 'critically endangered' status. This category refers to an ecological community which has been adequately surveyed and found to have been subject to a major contraction in area and/ or which was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated. Some threatened ecological communities are listed as 'endangered' under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. The threatened ecological communities in Rockingham Lakes Regional Park all have this status. This means that actions that are likely to have a significant impact on the threatened ecological communities require Commonwealth environmental impact assessment and approval under the Act.
Ramsar Convention	The Convention on Wetlands, signed in the Iranian city of Ramsar in 1971 (commonly known as the Ramsar Convention) is an intergovernmental treaty dedicated to the conservation and 'wise use' of wetlands. The Convention's mission is: 'the conservation and wise use of wetlands by national action and international cooperation as a means to achieving sustainable development throughout the world'. It encourages Contracting Parties to designate sites containing representative, rare or unique wetland types, or that are important for conserving biological diversity to the List of Wetlands of International Importance (Ramsar sites). These sites need to be managed to ensure their special ecological values are maintained or improved. Australia became a Contracting Party in 1974. Wetlands listed under the Convention are matters of national environmental significance, and thus protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Appendix E - Contacts

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