Yellagonga Regional Park

Draft Management Plan 2000-2010

Department of Conservation and Land Management

National Parks and Nature Conservation Authority

City of Joondalup

City of Wanneroo

Yellagonga Regional Park

Draft Management Plan

2000 - 2010

PLANNING TEAM

This plan was co-ordinated by a consultancy team led by Plan E working closely with the managers of Yellagonga Regional Park – CALM, the City of Joondalup and the City of Wanneroo.

Tim Bowra	Department of Conservation and Land Management
Brendan Dooley	Department of Conservation and Land Management
Jim Williamson	Department of Conservation and Land Management
Dennis Cluning	City of Joondalup
Phil Thompson	City of Wanneroo

What Do You Think?

We would like to know what you think of the proposals in this Draft Management Plan and encourage you to make a submission.

Why write a submission?

It is an opportunity to provide information, express your opinion, suggest alternatives and have a say on how we are proposing to manage the Yellagonga Regional Park over the next 10 years.

If you prefer not to make your own submission, you could make a joint submission with others.

What makes an effective submission?

To ensure your submission is as effective as possible:

- make it concise and clear;
- list your points according to the subject sections and page numbers in the Plan;
- say whether you agree or disagree with any or all of the objectives or recommendations, giving your reasons and sources of information;
- suggest alternatives to deal with any issue with which you may disagree.

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

Give reasons for your concerns and give support where appropriate. Information and constructive suggestions relating to your submission are most useful.

What criteria will be used in assessing your submission?

1. The draft management plan *will* be amended if a submission-

- provides additional resource information of direct relevance to management;
- provides additional information on affected user groups of direct relevance to management;
- indicates a change in or clarifies government legislation, management commitment or management policy;
- proposes strategies that would better achieve management goals and objectives; or
- indicates omissions, inaccuracies or a lack of clarity.

2. The management plan *will not* be amended if a submission-

- clearly supports the draft proposals;
- offers a neutral statement or no change is sought;
- addresses issues beyond the scope of the plan;
- makes points which are already in the plan or were considered during plan preparation;
- is one of amongst several widely divergent viewpoints received on the topic and the recommendations of the draft plan is still considered the best option; or
- contributes options which are not feasible (generally due to some aspect of existing legislation or government policy).

What Happens To Your Submission?

All submissions will be summarised according to the topics discussed. The Draft Management Plan will then be reviewed in the light of the submissions, according to criteria mentioned above. A summary of the submissions will be published along with the Final Management Plan, including an indication of how the plan will be amended or not in response to the submission. If a submission is marked "CONFIDENTIAL" then the author will remain anonymous in the analysis of public submissions document.

Deadline

Submissions are welcome for two months after the date of release. For enquiries please ring CALM on (08) 9334 0333.

Where to send your submission?

Written submissions should be sent to:

Executive Director
Department of Conservation and Land Management
Locked Bag 104
Bentley Delivery Centre WA 6983

Attention: Regional Parks Co-ordinator;
Yellagonga Regional Park Management Plan

Where to obtain additional copies of this plan?

CALM
17 Dick Perry Avenue
Technology Park, Western Precinct
Kensington 6151
(08) 9334 0333

CALM – Regional Parks Unit
19-21 Phillimore Street
Fremantle
(08) 9431 6500

CALM – Perth District
5 Dundebar Road
Wanneroo 6065
(08) 9405 1222

City of Joondalup
Boas Avenue
Joondalup 6025
(08) 9400 7000

City of Wanneroo
11 Moolanda Boulevard
Kingsley, 6026
(08) 9405 5000

WA Naturally
47 Henry Street
Fremantle WA 6160
(08) 9430 8600

Or visit CALM's NatureBase website at http://www.calm.wa.gov.au

How to Use This Plan.

This plan is divided into sections as set out in the table of contents. A statement of the principal management directions is given at the beginning of each section. Within each section are subsections. Each subsection begins with the objectives to be achieved by management, followed by a discussion of the main issues and then strategies, accompanied by the bodies responsible for achieving each objective and a priority rating. Priority ratings provide an indication of the relative importance of a strategy. The management bodies names have been abbreviated and a list of all abbreviations used and their meaning is on page 50.

ACKNOWLEDGMENTS

Numerous individuals and groups have contributed valuable ideas and information in the preparation of this plan and their efforts are gratefully acknowledged.

In particular, the contribution of the Yellagonga Regional Park Community Advisory Committee chaired by Mr Peter McKenzie, and included members, Mr Laurie Bolan, Dr Mike Bamford, Dr Hugo Bekle, Mr David Udy, Mr Trevor Moran, and Mr David Stalker. Other contributors include, Leon Griffiths, Dr Ken Atkins, Dr Peter Mawson, Robert Towers, David Mitchell, Tracy Churchill, Chris Portlock, Aamon Fennessy, Lyndon Mutter, Dr Andrew Burbidge, Roger Armstrong, Wayne Schmidt, Terry Maher, Annabelle Vowels, Jayson Puls, Jon Kaub, Greg Napier (CALM), Ray Fischer (City of Joondalup), Paul Holmes and Joanne Smith (City of Wanneroo). The consultancy team comprised, David White, Rod Safstrom, John Wood, John Tuzee, Bill James, and Linda Taman,

NOMENCLATURE

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

CITY OF JOONDALUP AND CITY OF WANNEROO

The Cities of Joondalup and Wanneroo have worked closely with CALM in the preparation of this Draft Management Plan and have agreed to its release for public comment. The proposals contained in this Plan have not been endorsed by the Cities. The Cities shall, jointly with CALM, consider the submissions made on the Draft Plan and consider whsy changes should be made in light of those submissions. At that time the respective Councils of Joondalup and Wanneroo shall consider the matter of formal endorsement of the Final Management Plan.

THE NATIONAL PARKS AND NATURE CONSERVATION AUTHORITY AND THE DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT.

All National Parks, Conservation Parks, Nature Reserves, and other similar reserves are placed in the care, control and management of the National Parks and Nature Conservation Authority (NPNCA). These reserves are managed on behalf of the NPNCA by the Department of Conservation and Land Management (CALM).

As a controlling body, the NPNCA is responsible for having management plans prepared for all lands that are vested in it. This plan is prepared by CALM and issued as a draft plan by the NPNCA for public comment prior to final approval by the Minister for the Environment.

Preface

Regional parks are areas of Region Open Space which are identified by planning procedures as having outstanding conservation, landscape and recreation values. Regional parks provide the opportunity for a consortium of management agencies and private landowners to develop co-ordinated planning and management strategies.

Regional parks were first proposed in the Stephenson - Hepburn Report of 1955 which was the basis of the Perth Metropolitan Region Scheme in 1963. Since then, State planning agencies have been acquiring land in anticipation of the time when regional parks would be formally created.

In 1997, the State government announced a commitment to introduce legislation to give regional parks legal standing and vesting in the NPNCA. Eight regional parks were recognised as formal identities with the coordination of their management progressively transferred to CALM. Other regionally significant parklands exist within the Perth metropolitan region, for example Kings Park, Bold Park and Whiteman Park, these parks are managed by other government agencies.

This Management Plan is a commitment of the State and local governments to coordinate the management of Yellagonga Regional Park. The role of CALM in regional park management is two fold. Firstly, it is to manage the areas of regional parks that are vested in the NPNCA. Secondly, it is responsible for coordinating the management of regional parks. The latter is initiated through the preparation of this management plan. Generally, CALM will manage the conservation areas, and the local governments of Joondalup and Wanneroo will manage the recreation areas.

The Yellagonga Regional Park is important in terms of both the conservation values and the recreational opportunities it encompasses within a highly urbanised environment. This Management Plan, which is based on previously prepared ecological, recreational and historical surveys, seeks to establish a clear vision for how this important public asset can best be managed and protected.

The Park faces a number of critical management challenges such as water quality, controlling the invasion of weeds, the occurrence of fire and the demand for access to the Park by the community.

Work by management authorities supported by the local community is already taking place in the Park. This draft Management Plan aims to protect the Park's conservation areas and provide a sound basis for planning to rehabilitate degraded areas, whilst allowing for recreational activities that will not compromise the natural assets of the Park.

Table of Contents

A. **INTRODUCTION** 1
1 - Purpose and Status of the Management Plan 1
2 - Regional Parks 1
3 - Yellagonga Regional Park 2
4 - The Management Plan and Community Involvement 4

B. **PRINCIPAL MANAGEMENT DIRECTIONS** 6
5 - The Vision for the Park 6
6 - Management Policies 6
7 - Land Tenure and Park Boundary 6
8 - Legislative Amendments and Interim Management 7
9 - Park Management Zones 8
10 - Integrated Management of the Park 12
11 - Key Performance Indicators 12

C. **CONSERVATION** 14
12 - Principal Conservation Directions 14
13 - Landform, Geology and Soils 14
14 - The Lakes and Wetlands 15
15 - Flora and Vegetation 17
16 - Fauna 21
17 - Weeds 22
18 - Fire 23
19 - Midge and Mosquito Control 24
20 - Pets and Introduced Animals 24
21 - Rehabilitation 25
22 - Cultural Heritage 26
23 - Park Aesthetics and Landscape Amenity 29
24 - Greenway Corridors and Links 29

D. **RECREATION** 31
25 - Principal Recreation Directions 31
26 - Recreation Sites and Facilities 31
27 - Visitor Use 32
28 - Park Access and Circulation 33
29 - Signs 36
30 - Visitor Safety 36

E. **LEASES AND COMMERCIAL OPERATIONS** 37
31 - Principal Commercial Directions 37
32 - Commercial Operations and Leases 37
33 - Services and Utilities 40

F. **RESEARCH AND MONITORING** 42
34 - Principal Research and Monitoring Directions 42
35 - Research and Monitoring 42

G. **COMMUNITY RELATIONS** 43
36 - Principal Community Relations Directions 43
37 - Information, Interpretation and Education 43

H. **PLAN IMPLEMENTATION.** 45
38 - Priorities, Funding and Staff 45
39 - Community Involvement 45
40 - Term of the Plan 46

References and Bibliography 47
Abbreviations 50
Appendix 1: Contacts 51

Figures

Figure 1 - Park Location 2
Figure 2 - Community Involvement in the Management Planning Process 5
Figure 3 - Existing Land Tenure and Park Boundary 9
Figure 4 - Management Zones and Areas 10
Figure 5 - Water Level Fluctuation 16
Figure 6 - Vegetation 20
Figure 7 - Non Aboriginal Heritage Sites 28
Figure 8 - Greenway Corridors and Links 30
Figure 9 - Recreation Nodes within Yellagonga Regional Park 31
Figure 10 - Recreation Masterplan 35

Tables

Table 1 - Management Zones 11
Table 2 – Summary of Key Performance Indicators 13

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 broad direction for the planning, management and development of Yellagonga Regional Park ("the Park"). It will do this by encouraging the protection of park values, anticipating future community requirements and developing strategies aimed at addressing management issues and concerns. The Plan will help ensure the Park is managed appropriately and is capable of sustaining its high nature conservation and cultural values as well as use by the community.

Given the strategic nature of this Plan, more detailed implementation plans will be required prior to operations taking place within the Park. Examples of implementation plans proposed in this Plan include a Weed Control Plan, Rehabilitation Plan and Site Development Plan for Lot 1.

STATUS OF THE PLAN

This Plan provides statutory direction over all lands and waters of the Park vested in the National Parks and Nature Conservation Authority (NPNCA) and managed by the Department of Conservation and Land Management (CALM). The Plan will act as an "umbrella" document coordinating existing plans for specific areas of the Park. Implementation of existing plans will need to be consistent with the overall direction of this Plan. Additionally, future plans for areas within the Park will need to be written in a manner that complements the Yellagonga Regional Park Management Plan.

The NPNCA and Western Australian Planning Commission (WAPC) endorse this Plan and acknowledge that CALM has the responsibility for coordinating the management of the Park. In consultation with CALM, the WAPC will use this Plan to assist with the assessment of development proposals on lands within and adjoining Yellagonga Regional Park.

The proposals contained in this Plan have not been endorsed by the Cities of Joondalup and Wanneroo. Following public comment on the Plan, the respective Councils of Joondalup and Wanneroo will consider formal endorsement of the Final Management Plan.

2 - Regional Parks

WHAT IS A REGIONAL PARK?

Regional parks are areas of Region Open Space that are identified by planning procedures as having regionally significant conservation, landscape and recreation values. Regional parks are a land management category which provides the opportunity for a co-ordinated planning and management strategy by different land management agencies and private land owners.

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

As such regional parks could comprise collectively of lands with a variety of tenures and reserve purposes. They could be a package of multi-purpose, multi-vested reserves drawn together for co-ordinated management by CALM. Yellagonga Regional Park for example consists of land comprising Crown reserves placed in the care, control and management of the City of Joondalup, City of Wanneroo, and the NPNCA as well as freehold land owned by the WAPC and private individuals.

Those lands that have been acquired by the WAPC for inclusion into the Park are now to be transferred to the respective local governments and/or the NPNCA for management as part of the Park.

It is intended that the overlaying regional park concept will be put in place while maintaining the high level of protection currently existing for lands already placed in the care, control and management of the NPNCA (such as national parks or nature reserves) that are found within regional parks.

THE REGIONAL PARK CONCEPT

The concept of Regional Open Space was first introduced to Western Australia by the Stephenson - Hepburn Report in 1955, which recommended that a statutory region plan be prepared for Perth which reserved private land required for future public purposes. In 1963, the Perth Metropolitan Region Scheme (MRS) was established and 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 to protect open space of regional significance for conservation and recreation.

The Environmental Protection Authority's (EPA) Conservation Reserves Report for Western Australia, The Darling System – System 6 (1983), identified areas with regionally significant conservation, landscape and recreation value. It also recommended areas of land to be managed as regional parks. A system of regional parks was envisaged which included the land reserved for "Parks and Recreation" in the MRS which surrounded the Lakes of Joondalup and Goollelal (System Six Recommendation M7).

In 1989, the State government decided that the responsibility for regional park management be established within CALM and that the responsibility for planning the acquisition of lands for regional open space

be retained by the Ministry for Planning (MFP) on behalf of the WAPC.

A task force report (1991) was prepared by the former Department of Planning and Urban Development (DPUD) and CALM outlining proposed administration, planning and management of regional open space.

The EPA's Red Book status report (1993) 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.

In June 1997, the State government announced a commitment to introduce legislation to give regional parks legal standing and vesting in the NPNCA. The coordination of management of eight metropolitan regional parks would be progressively transferred to CALM. The rresponsibility for overall planning and continued acquisition of private lands that comprise regional parks is still retained by the Ministry for Planning (MFP) on behalf of the WAPC.

3 - Yellagonga Regional Park

In 1975, most of lands that now comprise Yellagonga Regional Park were reserved as "Parks and Recreation" in the MRS. Since that time most of the private lands within the Park have been acquired by State planning authorities.

The Park was named Yellagonga Regional Park in 1990 to honour Yellagonga, the leader of the Mooro people who inhabited the region north of the Swan River at the time of European settlement.

The Yellagonga Regional Park Planning Review (1992a) identified the area of land to be included in the Regional Park and recommended steps for its establishment and administration. The Planning Review Report suggested minor amendments to the MRS relating to the Park's boundaries, land acquisition and tenure arrangements as well as recommending that a Community Advisory Committee be formed to provide advice during the establishment phase.

The Planning Review Report also proposed that a management plan for Yellagonga Regional Park be prepared by CALM in conjunction with relevant local governments and the NPNCA.

OVERVIEW

Yellagonga Regional Park is currently one of eight regional parks within Perth metropolitan region. It is located approximately 20km north of Perth City and 6km from the Indian Ocean. It is approximately 13km long and varies in width from 1 to 1.5km. The Park comprises 1400ha and is primarily focussed on a wetland system which includes Lake Joondalup, Beenyup and Walluburnup Swamps, Lake Goollelal and the surrounding lands reserved in the MRS for "Parks and Recreation". It is of regional importance because of its natural, cultural and recreational resources in a rapidly growing suburban area. Figure 1 shows the location of the Park.

The wetlands within Yellagonga Regional Park are some of the more important in the Perth metropolitan region with the land and water areas supporting a large variety of wildlife species. The lakes also provide refuge for an array of bird life including migratory water birds in summer. Along the western shore of Lake Joondalup there are substantial areas of mature Jarrah - Marri - Tuart Woodland.

The conservation values of Yellagonga Regional Park are threatened by increasing nutrient levels in wetland systems, weed invasion in upland and wetland systems, disturbances by developments, altered fire regimes, and pressures from increased human use.

The Park is of cultural significance to the local Aboriginal community who used the lakes and surrounds as camping areas and as a source of food and water. It also contains historical remnants of early European settlement.

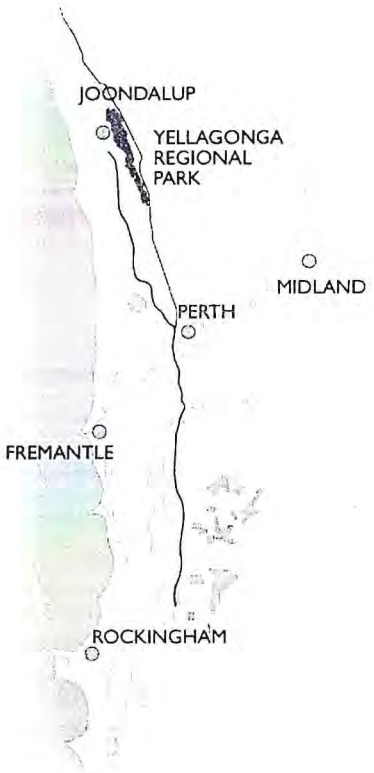


Figure 1 - Park Location

A wide range of recreational opportunities and facilities are available to Park visitors. Natural features such as Lake Joondalup and Lake Goollelal along with parkland settings at Neil Hawkins Park attract many people to the Park. The open space and water bodies provide significant conservation and amenity values within the rapidly developing surroundings. The lakes and wetlands also provide research and educational opportunities for better understanding urban lakes and wetlands, their ecosystems and groundwater interaction.

Yellagonga Regional Park adjoins the City Centre of Joondalup, the regional focus of Perth's North West Corridor. In 1996 the population of the former City of

Wanneroo (now the City of Joondalup and the City of Wanneroo) was 213,368. The rapid growth in the City of Joondalup and the City of Wanneroo is expected to continue, with the population anticipated to grow to over 415,000 by 2021 (DPUD, 1992). The Park's regional focus will also attract visitors from a broad area within metropolitan Perth, as well as people from interstate and overseas. The pressures on the Park and challenges to the managing agencies will continue to grow over time. It will be the role of the Park managers with support from the community to implement this Plan to effectively manage and counter those pressures.

PHYSICAL SETTING

The Park is located within recently settled suburbs of Perth's North West Corridor. In the past, most of the land surrounding the Park has been extensively farmed. The moist soils and the ready availability of ground water have attracted market gardeners since the 1950's. During the 1970's and 80's the suburbs surrounding the Park underwent extremely rapid growth. This growth has now moved north of the Park, but will continue to influence the Park both directly and indirectly.

The lakes and wetlands are the dominant landscape features of the Park. These lakes and wetlands are surface expressions of the groundwater, which emerges in interdunal swales within the Spearwood Dune System as a chain of linear lakes and wetlands. This chain of lakes begins 21 kilometres to the north at Loch McNess in Yanchep and extend south to Lake Goollelal. Lake Joondalup, the largest of the water bodies lies in the northern half of the Park. Walluburnup and Beenyup Swamps are located centrally within the Park, and Lake Goollelal is situated in the southernmost part of the Park.

The land rises gently to the east. Much of this eastern land is highly modified and is undergoing rapid change from grazing and horticultural uses to urban residential. The land to the west rises more sharply. Local vegetation is well represented on the western side and is a very significant component of the Park. The steeper, drier slopes and rock outcrops on the western side probably deterred rural endeavours. Much of the land west of the Park has been developed for urban residential uses.

Increases in the population of the region have led to the creation of a number of municipal parklands and walking trails within the boundaries of the Park.

PARK VALUES

Natural Environment Value

Yellagonga Regional Park contains a wide variety of ecosystems from upland forest, fringing wetland and aquatic vegetation to open water bodies. This rich diversity and complexity of ecosystems has very high conservation value within a rapidly expanding urban setting. The wetlands within the Park are some of the last remaining freshwater wetland systems on the Swan Coastal Plain.

The vegetation communities found within Yellagonga Regional Park are significant as they are representative of communities once widespread on the Swan Coastal Plain but now significantly cleared. The vegetation on the uplands surrounding the wetlands was once Jarrah-Marri-Banksia (*Eucalyptus marginata - Corymbia calophylla - Banksia*) Open Forest, and Tuart-Jarrah-Marri (*Eucalyptus gomphocephala - E. marginata - Corymbia calophylla*) Open Forest.

The wetlands of Yellagonga Regional Park serve as important breeding grounds for local birds and as a summer refuge for a diverse bird population, many of which are trans-equatorial migratory wading birds. The diversity of wetland and upland habitats cater for a variety of waterbirds and bushbirds.

The Yellagonga wetlands are of international and national significance being listed on the ANCA Directory of Important Wetlands in Australia and the Register of the National Estate.

Cultural Heritage Value

Yellagonga Regional Park has cultural and historical significance to both Aboriginal and non Aboriginal people. There are seven listed Aboriginal sites within the Park known to the Aboriginal Affairs Department and another four sites adjoining the Park. In addition, local Aboriginal Elders have identified several other sites, which are yet to be listed.

The significance of Yellagonga Regional Park to the local Aboriginal people (Nyungar) is that it was an important camping area used widely for watering, hunting and gathering, tool making, corroborees, and summer social life. In the Aboriginal seasonal cycle of camp movements, it was used as an east-west staging between the foothills and the ocean, and a north-south staging between Mt. Eliza and the Moore River. The lands of Yellagonga Regional Park comprised a significant camp due to its centrality within the Mooro district, its proximity to the ocean and other lakes and the abundance of food including wildfowl, kangaroos and other marsupials (Brittain 1990).

According to Mr Ken Colbung, Yellagonga Regional Park is important to the present Nyungar people forming part of their Dreaming.

Non Aboriginal people also have associations to the area. Brittain (1990) notes 100 items, people, places or events which are of significance within and surrounding Yellagonga Regional Park.

Landscape Value

Yellagonga Regional Park provides significant landscape and amenity value to the region. The Park's landscape provides strong visual connections both within and into surrounding areas. Significant views of the major water features including the lake landscapes of Joondalup and Goollelal can be appreciated from many vantage points around the Park. These views are an important part of the Park's identity. The relationship of adjoining land uses to the Park's landscape can have a significant impact on the overall amenity of the Park.

Many landscape character types contribute to the overall high visual quality of the Park ranging from mature woodland areas to extensive views of open water (along with its wildlife) to well maintained areas of grassed parkland.

Recreational Value

Yellagonga Regional Park is of high recreational value as it provides opportunities for a wide range of passive and active recreation.

Of particular significance is the opportunity to recreate in natural environments that are relatively undisturbed yet close to urban areas. A wide variety of natural features such as the lakes, wetlands and bushland areas, provide visitors with a multitude of experiences and recreational opportunities. It is these features in a natural park setting that attracts people to the Park.

There are many recreational opportunities which may become available to Park visitors in addition to those already enjoyed. These might include orienteering, bicycle riding, roller blading, bird watching and ecotourism activities. The nature of these activities will need to be closely linked to the particular characteristics and qualities of the Park.

Yellagonga Regional Park contains a number of smaller recreation nodes catering for informal recreation. They offer a variety of settings, facilities and uses. Neil Hawkins Park, which is the main recreation node of the Park, caters for family picnics, large group activities and summertime outdoor concerts and performances. Picnic Cove Park and Banyandah Park are less developed, providing opportunities for small picnics and other informal recreational activities.

The eastern bank of Lake Joondalup caters for active sporting activities at Joondalup Park and Scenic Drive Park. Indoor sporting and community activities occur at Wanneroo Indoor Community Recreation Centre.

Yellagonga Regional Park also presents recreational value in terms of its rich cultural heritage and historical background. Two heritage trails are located within the Park. The Lake Joondalup Trail is a 27km self-guided walk/drive trail, which traces the development of Wanneroo around Lake Joondalup. The Yaberoo – Budjara Heritage Trail is a 28km walk trail which links Lake Joondalup and Yanchep National Park and highlights features of local Aboriginal and non Aboriginal cultural significance in the area.

Perry's Paddock is the site for Wanneroo's Annual Picnic Day and provides a venue for other large scale outdoor events. The annual picnic is an important social day for the people of Wanneroo.

Cockman House also offers recreational value for those interested in local history and its relationship to the Park. It provides an example of a typical limestone cottage of the early settlers to the area.

Commercial Values

There are opportunities for the establishment of commercial operations within Yellagonga Regional Park. These could range from hire facilities at activity nodes around the Park to a kiosk or restaurant to education facilities providing a commercial component associated with interpretation and information about the natural environment and cultural values of the Park.

There is a growing demand and expectation in the community for commercial activities that can link to the values of the Park and so engage Park visitors to interact in new ways – without compromising or degrading the qualities of the environment. Some of these may be adventure based while others would rely on interpretation and education. Operations, which reinforce the natural or cultural values of the Park, will be the most appropriate and valuable enterprises.

Research Value

Yellagonga Regional Park has significant research and scientific values. On one hand, it contains rich, dynamic ecosystems with seasonal and periodic variations, subject to considerable external pressures and inputs. On the other hand it has areas with high recreational demand requiring an understanding of changing social use of natural areas for recreation and landscape design.

In particular, the extraction of technical data on wetland ecosystems, water quality and water quantity makes the Park an extremely valuable resource in gaining technical and managerial expertise that can be applied to other wetlands across the Swan Coastal Plain.

4 - The Management Plan and Community Involvement

The Management Plan for Yellagonga Regional Park will be prepared in five phases:

1. The first phase was aimed at identifying the 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.

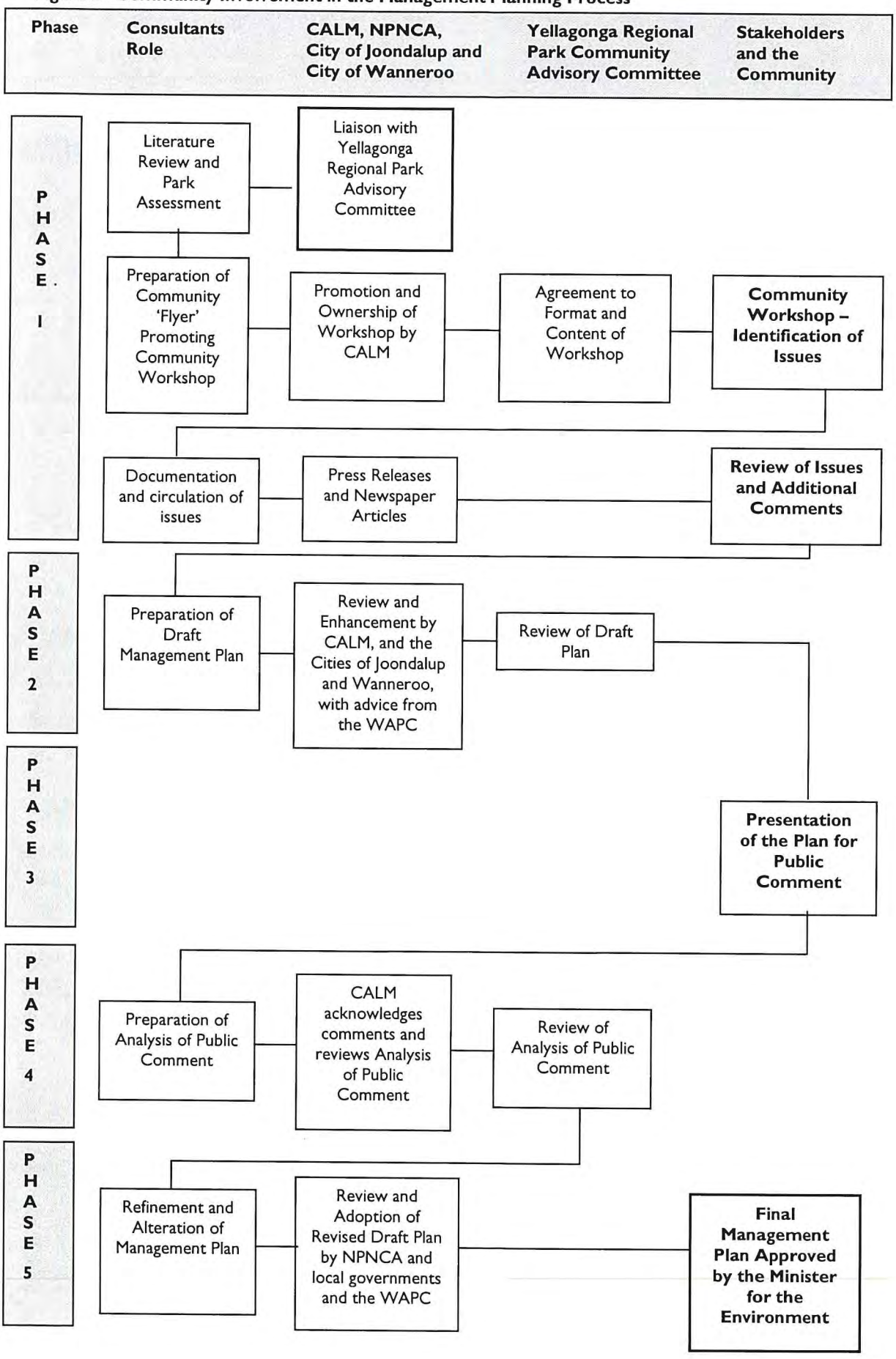
2. The second phase was the preparation of the Draft Management Plan. This involved identifying values and preparing planning strategies to protect those values and address the issues identified in phase one. Within this phase CALM, the WAPC, the City of Joondalup and the City of Wanneroo provided advice on the development of the Plan.

3. The third phase involves presentation of the Draft Plan for public comment. Its availability for review will be widely advertised, the draft will be open for public comment for a period of two months, after which public submissions will be analysed.

4. Phase four will involve the acknowledgement and analysis of public submissions.

5. The fifth phase will involve the preparation of the final Plan incorporating issues or comments raised within submissions. The revised Plan will be submitted for adoption by the relevant managing agencies and for approval by the Minister for the Environment.

Figure 2 - Community Involvement in the Management Planning Process



B. PRINCIPAL MANAGEMENT DIRECTIONS

5 - The Vision for the Park

The objective is to adopt a long term vision for the Park and establish goals that will achieve this.

The long term vision is that:

"Yellagonga Regional Park will be a quality wetland system supported by healthy forest, woodland and parklands with sustainable community use that recognises Aboriginal and non Aboriginal heritage in a visually harmonious environment."

GOALS

Goals have been set for each major part of the Management Plan, while objectives designed to achieve these goals have also been identified. The following management goals are proposed for the Park.

Conservation
Protect, conserve and enhance the Park's biota as well as its physical, cultural and landscape resources.

Recreation
Manage for recreation and leisure by providing high quality recreation opportunities which are compatible with the protection and enhancement of Park values.

Commercial
Allow for appropriate commercial and other uses within the Park that service visitor requirements, contribute to Park management and minimise impacts on Park values.

Research and Monitoring
Seek a better understanding of the natural, cultural and social environments, and the impacts of visitor use and Park management.

Community Relations
Promote informed appreciation of the Park's natural environment, cultural values and recreation opportunities and facilitate liaison with the community about its management.

Integration of Management
Develop and maintain integrated and co-ordinated management arrangements between the participating Park managers and planning authorities.

Strategy

1. **Establish conservation as the primary goal of the Park and allow recreation and other uses of the Park to occur to the extent that the primary goal is not impaired. (CALM, CJ,CW) [High]**

6 - Management Policies

The objective is to integrate the policies of the management agencies to complement and support the vision for the Park.

NPNCA and CALM Management Policies
This plan is based on current National Parks and Nature Conservation Authority (NPNCA) and CALM policies. These policies derive from legislation, principally the CALM Act (1984) and the Wildlife Conservation Act (1950), and associated regulations. Policies are published and distributed throughout CALM as policy statements. They are available to the public on request. These policies, as they relate to this Park, cover aspects such as recreation, conservation and education.

Local Government
The management actions of the City of Joondalup and City of Wanneroo should reflect the intent of this Plan and will be co-ordinated by CALM. The local governments involved with Yellagonga Regional Park will adopt the principles outlined in this Plan as policy for the future management of the Park.

Strategies

1. **Prepare a policy statement for the management of the Park that reflects the principles outlined in this Plan. (CJ,CW) [High]**

7 - Land Tenure and Park Boundary

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

LAND TENURE

Land within the Park consists of reserves created under the Land Administration Act 1997 (LAA) and placed in the care, control and management of a number of government agencies and local governments as well as freehold land owned by government agencies and private individuals.

This Plan seeks to reserve land and place it in the care, control and management of either:

- the National Parks and Nature Conservation Authority; or
- the relevant local government/s.

Under the Area Assistance Grants Scheme, the National Trust of Australia and the WAPC are currently discussing the transfer of management responsibility for Luisini Winery (Area 24).

Crown reserves will be created in accordance with the management areas outlined in the Plan's Park Management Zones (Section 9).

All reserves created in Yellagonga Regional Park will have management orders under the LAA requiring the relevant managing agency to comply with the Yellagonga Regional Park Management Plan. Reserves to be placed in the care, control and management of the local governments comprise Areas 10, 14, 16, 23 and 25 as well as the northern portion of Area 6. Area 24 will be created as a reserve and placed in the care, control and management of the National Trust of Australia (see Figure 4).

Transfer of government freehold land
Freehold lands owned by the WAPC will be converted into reserves under the LAA and placed in the care, control and management of the NPNCA or the relevant local government and managed in accordance with this Plan.

Reserves created from WAPC freehold land and placed in the care, control and management of the NPNCA will be afforded an appropriate purpose for the protection and enhancement of Park values and will be classified as class A under the LAA. As agreed to by the relevant local governments, reserves created from WAPC freehold and placed in the care, control and management of local government will be reserved for the purpose of "Conservation and Recreation" and afforded similar tenure arrangements as the NPNCA vested reserves.

Freehold land owned by State government agencies or local governments, including those currently servicing drainage or other similar requirements, will be afforded an appropriate reserve purpose and tenure arrangements consistent with the protection and enhancement of Park values.

Crown reserves and Unallocated Crown land
Existing Crown land reserved for utilities or services such as drainage will retain their existing reserve purpose and tenure arrangements. Other Crown reserves will retain their existing purpose, however, their extent (area) and managing agency may be modified in accordance to Figure 4. The closure of road reserves considered unnecessary by planning and management agencies will be further investigated.

Unallocated Crown land is to be created as reserves and transferred to either the NPNCA or relevant local government. These reserves will be afforded an appropriate reserve purpose and tenure arrangements under the LAA consistent with the protection and enhancement of Park values.

Private property
This Plan is not the mechanism by which freehold land, held by private individuals, is to be acquired by the WAPC. The Ministry for Planning on behalf of the WAPC will continue its voluntary acquisition program within regional parks.

Until acquired by the WAPC these lands will remain protected under Perth's Metropolitan Region Scheme by their "Parks and Recreation" reservation.

This Plan will not dictate the management of privately owned freehold land held by individuals in the Park. However, when the land is acquired by the WAPC, management will be in accordance with the Plan's Park Management Zones (Section 9).

Access by Park visitors to areas of private property owned by individuals in the Park is not available until it is acquired by the WAPC. Negotiated settlements are required in order to obtain the remainder of private land within the Park boundary.

PARK BOUNDARY

The Yellagonga Regional Park boundary has been determined by the Ministry for Planning (MFP) and is based on the boundary advocated by the State Planning Commission in 1989 (now the WAPC). A number of minor amendments have been made to the initial alignment and these changes are documented in the Planning Review prepared by the Department of Planning and Urban Development in 1992.

The existing Park boundary and land tenure at the date of this Plan is shown on Figure 3. The boundary reflects the existing Metropolitan Regional Scheme (MRS) under which the entire Park is reserved as "Parks and Recreation."

Strategies

1. **Create reserves to be placed in the care, control and management of the relevant managing agency in accordance with the Management Zones outlined in Table 1 (DOLA, WAPC, MfP, NPNCA, CALM, CJ, CW, infrastructure providers) [Medium]**
2. **Establish management orders for reserves to be placed in the care, control and management of the relevant local governments requiring compliance with this Plan. (DOLA) [Medium]**
3. **Seek to acquire the remainder of the private land within the Park as soon as practicable from willing landowners. (WAPC) [High]**
4. **Investigate the closure of Della Road and any other unnecessary road reserves within the boundary of the Park and include them in the gazetted area of the Park. (CALM, CJ,CW) [Medium]**

8 - Legislative Amendments and Interim Management

The objectives are to provide for the protection of the Park under the Conservation and Land Management Act 1984 and to ensure that interim management arrangements facilitate the appropriate management of the Park.

INTERIM MANAGEMENT ARRANGEMENTS

Prior to the gazettal of the final Plan and subsequent transfer of lands to the appropriate managing agencies, there is a need to clearly define interim management

arrangements between the land managing agencies involved in the Park.

CALM will coordinate the interim management of Yellagonga Regional Park by Joint Management Agreements prepared for Crown lands and freehold lands controlled by State or local government agencies involved in the Park.

A Regional Park Joint Management Agreement for interim Park management may comprise either:

- a Section 16 Agreement of the CALM Act; and/or
- a Memorandum of Understanding;

Interim management of WAPC owned land
Section 16 of the CALM Act allows the Department of Conservation and Land Management to enter into agreements for the management of private land.

Following June 1997, when the management responsibility for regional parks was progressively transferred to CALM, the WAPC and CALM agreed to enter into a Section 16 agreement under the CALM Act. This formal agreement will be an interim management arrangement prior to the land being placed in the care, control and management of the NPNCA or the relevant local governments.

The agreement includes all WAPC lands within regional parks with the exception of those leased to local governments.

On lands owned by the WAPC, CALM will utilise the WAPC (Reserved Land) regulations administered by the Ministry for Planning.

Interim management of Crown land and freehold land controlled by government agencies
Local governments and State government agencies will be responsible for managing lands under their control. An overall integrated approach to the interim management of Yellagonga Regional Park will be co-ordinated by CALM.

Interim management arrangements regarding freehold land owned by individuals
Where individuals own private lands within the Park, they are responsible for its management. CALM may seek formal management arrangements with individual private landowners within the Park.

LEGISLATIVE AMENDMENTS

The Conservation and Land Management Act 1984 (CALM Act) will need to be altered to specifically include the management of regional parks. The management of regional parks may be included as a function of the Department of Conservation and Land Management in the Act.

Due to the complexity of land tenures within each of the parks, regional parks may not be listed as a separate land category of the CALM Act, under Section 5 of the Act. Regional parks may accommodate any of the current (or future) Section 5 land categories.

Strategies

1. **Finalise the Section 16 Agreement under the CALM Act with the WAPC. (CALM, WAPC, NPNCA) [High]**

2. **Prepare Interagency Joint Management Agreements for interim park management for areas controlled by State or local government. (CALM, NPNCA, CJ,CW) [High]**

3. **Amend the CALM Act (1984) to provide for regional parks. (CALM) [Medium]**

9 - Park Management Zones

The objective is to adopt a management zoning system that protects 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 minimising existing and potential conflicts between uses and activities. They provide a broad guide to the public uses and management activities which are appropriate in certain areas and indicate which management objectives have priority in any area.

The Management Zones and Areas Plan (Figure 4) for the Park is based on recommendations made by the former Department of Planning and Urban Development (1992a). It reflects the conservation significance of the area and the intensity and types of recreational uses.

Within Yellagonga Regional Park four management zones have been identified:

a) Conservation and Protection
b) Natural Environment Uses
c) Recreation
d) Sport and Recreation

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

Strategy

1. **Base future management of the Park on the zoning plan. (CALM, CJ,CW) [Ongoing]**

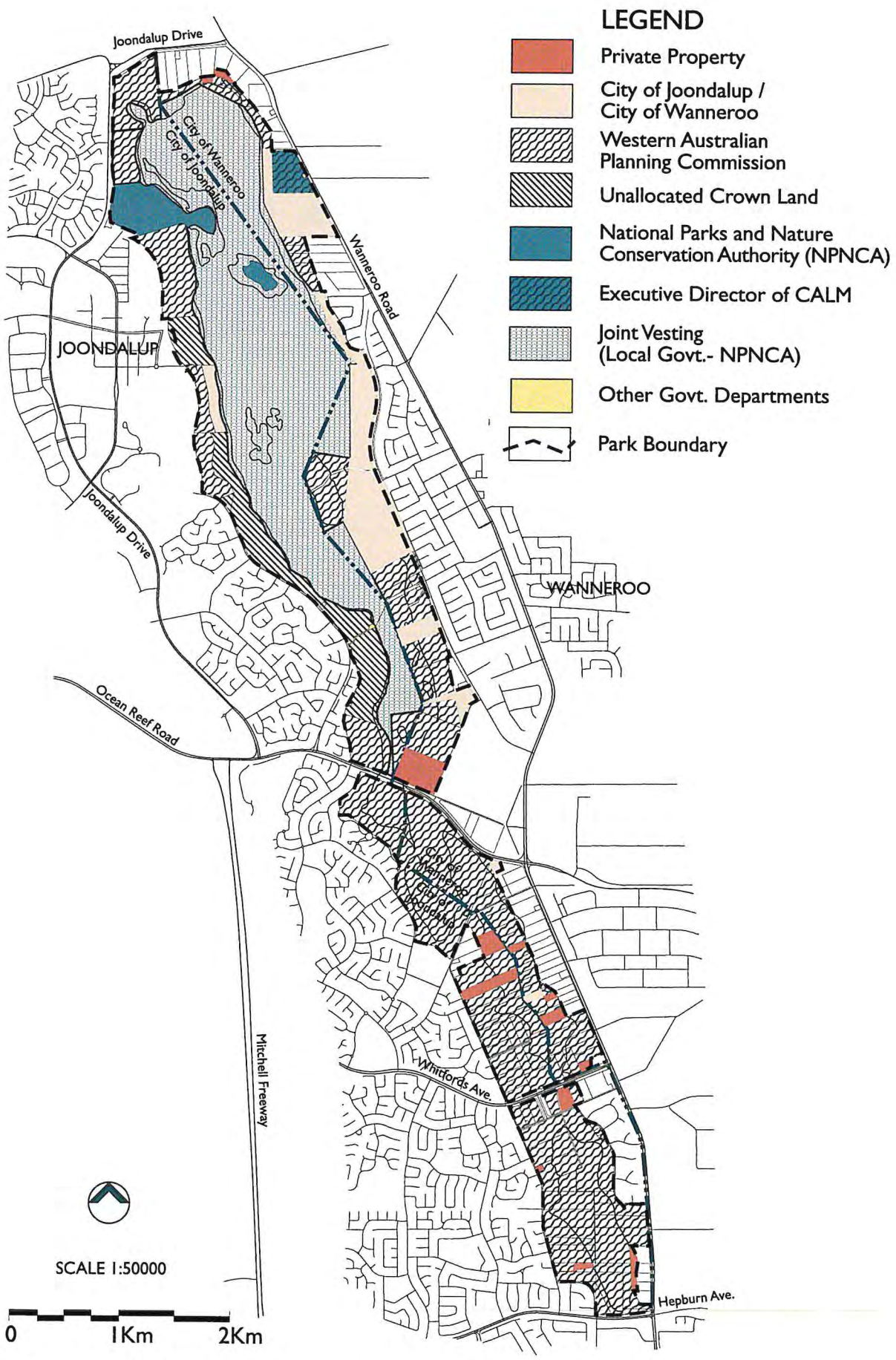


Figure 3 - Existing Land Tenure and Park Boundary

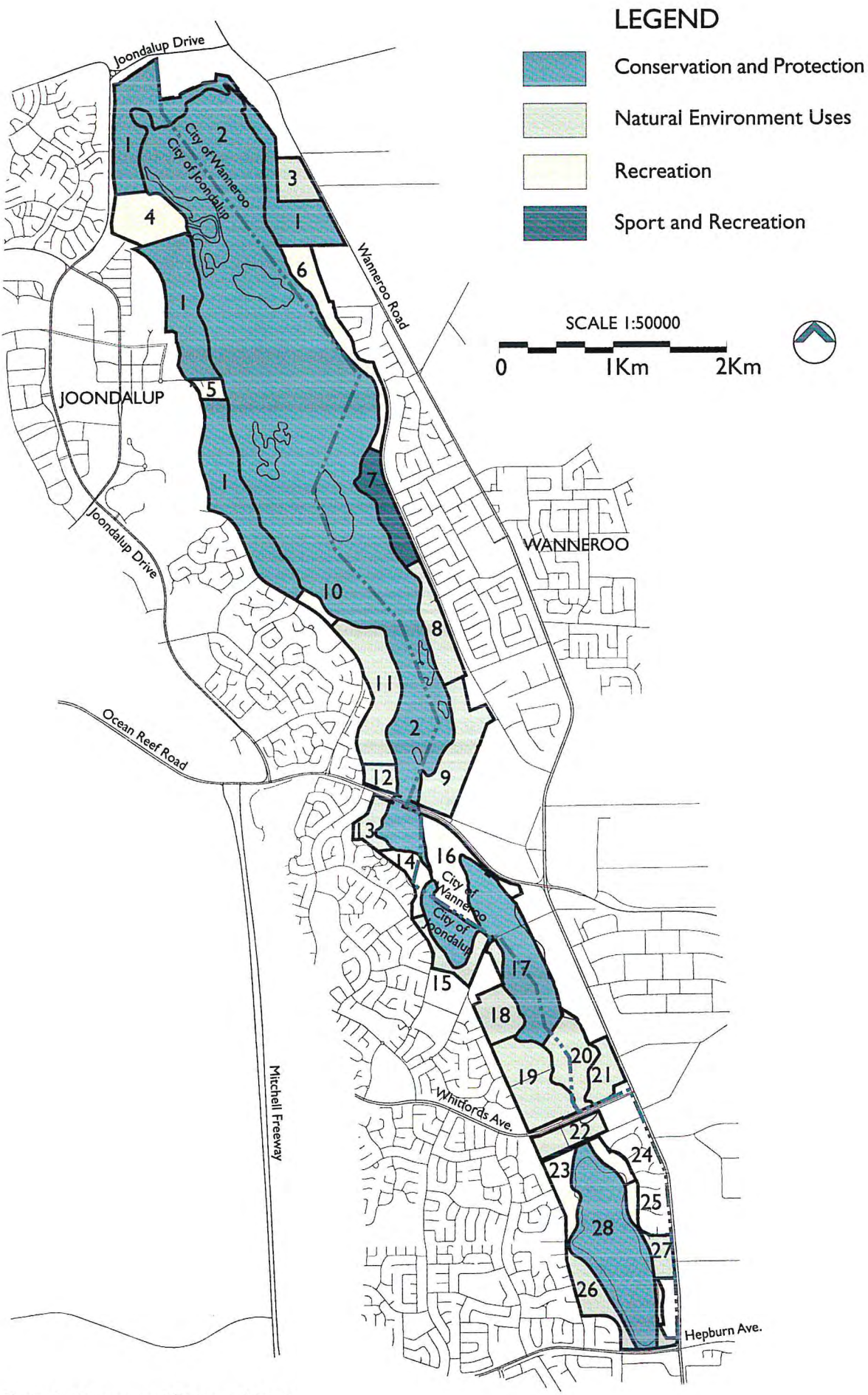


Figure 4 - Management Zones and Areas

Table 1 - Management Zones

Management Zone	Management Area	Management Agency	Management Emphasis	Acceptable Uses and Facilities
Conservation and Protection	Area 1* Area 2** Area 17** Area 28**	CALM Jointly managed by CALM, the City of Joondalup and City of Wanneroo CALM CALM	The management emphasis of this zone is to protect and where possible enhance the conservation values and landscape qualities of the Park. Priority will be given to maintaining the natural state of conservation and protection areas with a minimum of impairment. Visible evidence of management will be minimal.	* Upland Areas: Restricted public access. Unauthorised vehicles prohibited. Development of facilities such as nature trails, cycles tracks and through access are acceptable. Rehabilitation of vegetation. Habitat protection for bird species and other fauna. Education and research uses allowed. ** Wetlands or Waterbodies: Restricted public access. Unauthorised watercraft and vehicles prohibited. Development of facilities, boardwalks and observation platforms are acceptable in certain locations. Rehabilitation of fringing vegetation. Maintenance of water quality and other habitats to ensure survival of wetland ecosystems. Education and research uses allowed.
Natural Environment Uses	Area 3 Area 18 Area 8 Area 19 Area 9 Area 20 Area 11 Area 21 Area 12 Area 22 Area 13 Area 26 Area 15 Area 27	CALM	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 Park area. 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 walking trails and cycle paths. Some development of facilities necessary, these may include education nodes and facilities associated with visitor nodes. The provision of facilities will depend on the values of the area and the community demand for facilities. Rehabilitation and habitat protection may be necessary.
Recreation	Area 4 Area 5 Area 6 Area 10 Area 14 Area 16 Area 23 Area 24 Area 25	CALM City of Joondalup City of Wanneroo City of Joondalup City of Joondalup City of Wanneroo City of Joondalup National Trust City of Joondalup	The prime emphasis of management will be to provide a variety of recreation opportunities. The type and intensity of facility provision 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. Visible evidence of management may be high.	Public use may be high in these areas. Predominantly passive recreation pursuits, allowing for park and picnic facility development. Commercial concessions may be considered appropriate within this management zone. Rehabilitation, landscaping and reticulation of areas may be necessary
Sport and Recreation	Area 7	City of Wanneroo	Sport and Recreation allows for areas to be used for indoor and outdoor sporting activities. Given these areas are of high use, management will endeavour to minimise incompatibilities with surrounding Park areas. Management involves minimising the impact of visitor activities through the sensitive placement and provision of access and facilities. Visible evidence of management may be high.	High use areas developed for active recreation pursuits. May include sporting ovals, car parking, buildings and reticulated and landscaped areas. Commercial concessions may be considered appropriate within this management zone.

10 - Integrated Management of the Park

The objective is to integrate the management of the Park by supporting the management goals and objectives of the Plan.

THE PARK MANAGEMENT STRUCTURE

The joint managers of the Park are CALM, the City of Joondalup and the City of Wanneroo, and their areas of responsibility are set out in the previous section on management zones. It is proposed that once the final Plan is gazetted, management will be in accordance with the strategies outlined in this Plan. This Plan will act as an interagency agreement for the Park's management between the relevant managing bodies.

CALM will be responsible for managing areas of the Park vested in the NPNCA. The State government considered CALM the most appropriate agency to provide a strong integrated framework for management of complex conservation and recreation areas. As such the overall coordination of management for Yellagonga Regional Park is CALM's responsibility. The Cities of Joondalup and Wanneroo will manage areas of the Park to be vested in them in accordance with the strategies outlined in this Plan.

Close co-operation is required by the Park's managers and the community for this Plan to be implemented efficiently and effectively. Strategic decisions will involve input and negotiation between the land management agencies. Joint working parties, comprising representatives from CALM and the relevant local governments and State government agencies, will be established to facilitate the preparation of detailed implementation plans for Yellagonga Regional Park.

Interagency agreements will be required to allow Park managers to coordinate and maintain consistency in the application and enforcement of regulations. The agreements will enable the Park managers to enforce regulations of other agencies throughout the Park.

Responsibility for overall planning and acquisition of lands for regional parks and Region Open Space is retained by the WAPC.

A common management direction

The establishment of a management structure, common goals and agreement on priorities are necessary for safeguarding this regional resource where a number of land owners, the general public and interest groups are involved. This draft Plan has been written in conjunction with all the proposed land managers, and comments are being sought from the public on the draft in order to establish a common management direction. Community involvement and community education are important components in achieving the management goals set out in this Plan.

Strategies

1. **Establish, where appropriate, joint working parties representing the relevant managing agencies for specific implementation plans. (CALM, CJ,CW) [High]**
2. **Prepare interagency agreements that provide Park management with the authority to regulate in all areas of the Park (eg local government rangers controlling dogs on CALM estate) (CALM, NPNCA, CJ,CW) [High]**

11 - Key Performance Indicators

The objective is to set key performance indicators in order to measure the overall effectiveness or otherwise of management in relation to protection and enhancement of Park values.

Defining key performance indicators 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.

Key performance indicators relate specifically to the management targets for key ecological and social values.

Key performance indicators for Yellagonga Regional Park are:

- Wetland health
- Bushland condition
- Fauna populations and species diversity
- Visitor satisfaction
- Visitor risk

(see Table 2 - Summary of Key Performance Indicators)

Key performance indicators are important in defining the monitoring programs to be set up for the Park. They also underpin the audit process of this Management Plan.

Strategies

1. **Establish baseline information to initiate the process of monitoring the Key Performance Indicators through implementation plans such as Weed Control and Rehabilitation Plans. (CALM) [High]**
2. **Develop an integrated program of survey, research and monitoring within the Park. The program should focus on the Key Performance Indicators. (CALM,CJ,CW) [High]**
3. **Audit and measure the overall effectiveness of Park management based on the Key Performance Indicators. (NPNCA) [Ongoing]**

Table 2 – Summary of Key Performance Indicators

Key Values	Key Objectives	Key Performance Indicators	Key Management Targets	Monitoring, Survey and Planning required
The Park contains some of the last remaining freshwater wetland systems on the Swan Coastal Plain with a diversity of ecosystems from upland forests, fringing wetland and aquatic vegetation to open water bodies.	To protect the wetland environments of the Park and manage the Park in accordance with Water and Rivers Commission policies.	Wetland health.	No decline in the current diversity of invertebrates (genus or family) which indicate wetland health.	Monitor the diversity of invertebrates (genius or family) occurring at the Yellagonga wetlands.
Vegetation communities in the Park are representative of communities once widespread on the Swan Coastal Plain but now significantly cleared.	To protect, conserve, and rehabilitate local or culturally significant flora and vegetation in the Park.	Bushland condition.	Reduce the total area of weeds in the Park, increase weed free areas in the Park and minimise the impact of unplanned incidences (eg wildfire).	Prepare and undertake operations from a Weed Control Plan and Rehabilitation Plan. Implement the Park's Fire Response Plan. Prepare a Dieback Interpretation Plan (if required).
The Parks acts as an important fauna reserve, bird breeding ground for local birds and a summer refuge for a diverse bird population.	To maintain viable populations and the current diversity of indigenous fauna species in the Park.	Fauna populations and species diversity.	No decline in the current populations and diversity of selected fauna species in the Park.	Monitor populations and diversity of selected fauna species in the Park
The Park provides opportunities for a wide range of passive and active recreation. Of particular significance is the opportunity to recreate in natural environments that are relatively undisturbed yet close to urban areas.	To ensure that the level of visitor use and behaviour is sustainable, and to maintain acceptable levels of visitor satisfaction.	Visitor satisfaction.	Maintain an overall trend of positive visitor satisfaction.	Complete a Visitor Survey.
The opportunity to recreate safely in the Park while experiencing the diversity of Park settings.	To enhance the safety of visitors in the Park.	Visitor risk.	Remove or mitigate all identified high risk sites or facilities in the Park.	Complete a Park Safety Audit.

C. CONSERVATION

12 - Principal Conservation Directions

CONSERVATION GOAL

Protect, conserve and enhance the Park's biota as well as its physical, cultural and landscape resources.

CONSERVATION STRATEGY

The strategy for conservation management of the Park is to conserve natural areas and minimise conflict between recreational use and conservation values (Section 9), control weeds (Section 17), minimise the effects of fire (Section 18), rehabilitate degraded areas (Section 21) and promote community education and involvement in the implementation of the Plan (Sections 36, 37, and 39).

13 - Landform, Geology and Soils

The objective is to protect and conserve the existing geological structure and soil associations in the Park.

LANDFORM

The lakes and wetlands of the Park lie in an interdunal swale of the Spearwood Dune System.

The landform surrounding the Park is representative of similar geological features found elsewhere on the Swan Coastal Plain, having been formed from large sand dunes which over time have become consolidated and stabilised with vegetation. The landform is characterised by relatively high elevation sloping dunes on the western side of the Park with generally more gentle slopes on the eastern side.

The eastern and southern portions of the Park are relatively flat with very gentle slopes leading down to Lake Goollelal and Walluburnup Swamp. The western slopes begin to steepen at Beenyup Swamp and increase in steepness towards the north-west portion of the Park with significant sections of this part of the Park having slopes greater than 10%.

GEOLOGY AND SOILS

The rock classification of the Spearwood System is the coastal (Tamala) limestone. The Spearwood Dune System consists largely of coarse grained wind blown dune material, similar to beach sand, with a large fraction of shell and micro fossil material and a small fraction of rounded quartz grains.

The soils of the Park have been studied and described by the CSIRO (McArthur and Bartle, 1980). The Spearwood Sands predominate through the western and southern portions of the Park. The soil consists of a dark brown sandy surface grading into a yellow brown or brown sand. Limestone usually occurs within a metre of the surface although depth tends to be variable. Limestone outcrops in places and forms interesting features on the western edge of Lake Joondalup where subterranean water flows have formed channels and caves through the limestone. The soil varies in fertility, from relatively fertile and moist on the western edges of Lake Joondalup, to freely draining sands which have low fertility on elevated slopes northwest of Lake Goollelal.

Karrakatta Sand (Yellow Phase) occurs on the eastern side of the Park and in pockets on the upper western slopes and neighbouring plateau. It consists of a grey-brown sandy surface which passes into bright yellow sand.

Beonaddy Sand occurs in the low-lying flats immediately adjacent to the Lakes and Swamps. The profile consists of a dark grey surface sand becoming lighter with depth. The water table is often within a metre of the surface in summer and may temporarily rise to the surface in winter.

Walluburnup Swamp is significant as an example of a Pleistocene wetland, a feature that has not been recorded elsewhere on the Swan Coastal Plan. The wetland contains the oldest known peat fills on the Swan Coastal Plain, and thus is an important archive for Holocene climatic and vegetation history in this part of the Swan Coastal Plain (Semenuik, 1997).

Erosion

Erosion is a localised problem occurring along the banks of Lake Joondalup where uncontrolled access causes damage to fringing vegetation. Erosion can occur from the effects of wave action generated from wind upon the lake's surface. This is a natural process and is most likely in areas on either side of stretches of open water.

Uncontrolled access in the Park will be reduced by formalising and restricting access to areas at risk from erosion.

Strategies

1. **Use clean soil, which is free of *Phytophthora* fungi and weeds, and similar to the natural soil types of the area when it is necessary to import soil into the Park. (CJ,CW, CALM) [Ongoing]**

14 - The Lakes and Wetlands

The objectives are to protect the wetland environments of the Park and manage the Park in accordance with Water and Rivers Commission policies.

The Yellagonga wetlands are surface expressions of the groundwater and as such respond to events which cause variations to the quality and quantity of groundwater supply.

Lake Joondalup and Lake Goollelal, although shallow by world standards, are relatively deep (1.55m and 1.82m respectively) compared with other lakes on the Swan Coastal Plain. (Water Authority of Western Australia 1995)

The water regimes of the Yellagonga wetlands respond to both natural process such as climatic change and importantly modified land uses within a catchment area. In order for the ecology of the wetlands to survive and maintenance of public amenity, the impact of existing and proposed land uses and activities which influence the wetlands' water regimes need to be understood and managed.

The results of monitoring wetlands on the Swan Coastal Plain and particularly Lake Joondalup indicates that the issues which affect water quality and levels in the Yellagonga wetlands include:

- Drainage and stormwater inflow;
- Surface water flows from surrounding land uses;
- Pollution and nutrient inputs from land uses in the catchment area;
- Other land uses or activities in the catchment area;
- Groundwater abstraction;
- Rainfall and evaporation rates.

Initiatives of Integrated Catchment Management developed by the City of Joondalup and City of Wanneroo are seeking to help address the landuse, drainage and pollution issues.

MANAGEMENT RESPONSIBILITY

The area of Lake Joondalup is jointly vested in CALM, the City of Joondalup and City of Wanneroo, therefore all three agencies are responsible for its management. Lake Goollelal, Beenyup and Walluburnup Swamps are owned by the WAPC and managed by CALM.

WATER LEVELS

As part of the Pinjar Ground Water Scheme, the Minister for the Environment has set environmental conditions on the Water and Rivers Commission to maintain prescribed water levels in those wetlands that are nominated as having high social or environmental value. Absolute minimum and preferred minimum water levels have been set by the Minister for the Environment for Lake Joondalup and Lake Goollelal as well as other wetlands on the Gnangara Mound (DPUD 1992a).

The preferred minimum water level reflects the level at which maintenance of social and environmental values of the wetland would be ensured. A maximum period permitted below the preferred minimum water level is specified for each lake. The absolute minimum water level is that below which social and environmental values of the wetland would be significantly threatened. The minimum water levels of both Lake Joondalup and Lake Goollelal are reviewed periodically.

In order to comply with the Ministerial conditions, responsibility for monitoring water levels is undertaken on a monthly basis by the Water and Rivers Commission. Regular monitoring records have been maintained since the early 1970s. The managers of the Park will support the Water and Rivers Commission's continued monitoring and review of the water levels in the Yellagonga wetlands.

The statutory preferred minimum water level of Lake Joondalup is 16.7m Australian Height Datum (AHD), with an absolute minimum level of 16.45m AHD. The number of consecutive months permitted below the preferred level is four in any 12 month period. The preferred minimum water level for Lake Goollelal is 26.4m AHD, with an absolute minimum of 26.25m AHD. The number of consecutive months permitted below the preferred level is two in any 12 month period.

It is necessary for the water regime to be managed to resemble the natural water cycle for the wetlands. A water level regulation devise placed at the Ocean Reef Road culvert between Lake Joondalup and the southern wetlands of the Park is helping to achieve this.

It is important to note that the major threat to the lake's ecosystem is lowering or raising the lake's water levels which may cause long term changes to the lake's aquatic and fringing vegetation association. This will in turn alter the ecology and threaten the wildlife species which inhabit the wetland systems. (DPUD 1992a).

Water levels rise and fall with the seasons and with longer-term weather patterns. Extensive areas of Lake Joondalup, in particular, dry out after a drier than average winter (see Figure 5).

An annual fluctuation in the depth of the Lake is approximately 1m and responds to a similar fluctuation in the water table. The annual drying out leads to the reduction of nutrients from the system and is therefore an important process in the ecology of the Lake (Balla, 1994).

It should be noted that the combined effect of increased public and private bore abstraction, greater urbanisation within the catchment and the proposed clearing of the Gnangara Pine Plantation is expected to increase water levels in the groundwater aquifer, thereby increasing water levels in the Yellagonga wetlands.

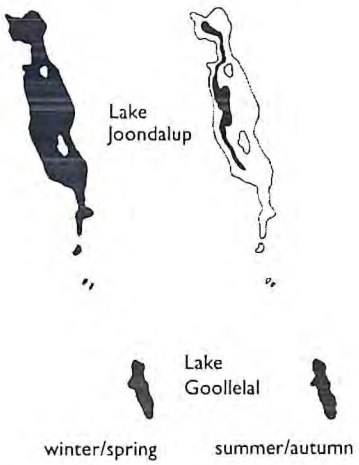


Figure 5 - Water Level Fluctuation

WATER QUALITY

Water quality has been studied at Lake Joondalup since the early 1970s. Data recorded by Congdon (1986) supports the claim that high nutrient levels first recorded in the main water body of Lake Joondalup in the 1970s are being maintained and may, in fact, be increasing if changes in water levels are taken into account (Kinear, Garnett, Beckle and Upton, 1997).

On the basis of nutrient levels (total phosphorous and total nitrogen) the trophic status of the Yellagonga wetlands was assessed as eutrophic (Kinear et al. 1997). Kinear et al. (1997) indicate that Lake Joondalup has been receiving highly-nutrient enriched water via northerly flow from Walluburnup and Beenyup Swamps for over two decades. The adverse effects of nutrient enriched wetlands include algal blooms, plagues of non-biting midges, algal toxicity, loss of amenity through odours and fouling of the shoreline (see Sections 19 and 23).

Phosphorus has been identified as a key nutrient necessary for the production of algae within wetlands on the Swan Coastal Plain. Monitoring of the lakes within the Park indicates that phosphorus levels are higher than acceptable limits (they exceed the criteria for hypertrophy). The phosphorus loading of Lake Joondalup has increased over a period which corresponds with an increase in the direct discharge of stormwater run off into the Park (Ove Arup and Partners, 1994). Algal blooms are occurring in the central section of Lake Joondalup throughout the year.

The major contributors of additional nutrients into the Lakes are stormwater run off, septic tank leaching and agricultural fertilisers. The City of Wanneroo commissioned a drainage study in 1994 that identified stormwater outlets and associated problems. The study recommended integrated catchment management strategies for removing, or at least reducing, the adverse impact of urban stormwater upon the water quality of the Regional Park (see Section 33).

Semi-aquatic fringe vegetation helps to maintain water quality by reducing the influx of nutrients through filtration and storage.

The feeding of water birds especially at Neil Hawkins Park has localised effects on water quality. Birds congregate in large numbers, uneaten food and faeces sink to the bottom of the lake and nutrient loading in the local area increases. Artificial feeding also has adverse effects on bird health and populations and will be discouraged (see Section 16).

HEALTH OF THE WETLAND ECOSYSTEM

The number of species of predatory invertebrate recorded at a wetland can be used as an indication of the state of the aquatic food chain (Rolls et al. 1990). An assessment of the health of the wetland ecosystems can be undertaken by considering higher taxonomic levels of invertebrates such as genus and family, rather than needing to identify organisms to the level of species.

This type of assessment (rapid bio-assessment) means the costs of assessing wetland health is reduced and allows for the possible involvement of community or school groups in assessment. Davis (1998) published a guide to wetland invertebrates of Southwestern Australia, which provides appropriate taxonomic keys for assessment.

Indicators of wetland health include:

- nutrients and chlorophyll-a concentrations;
- the presence of blue-green algae cells,
- macro-invertebrates and the avian community structure.

Strategies

1. **Implement the Integrated Catchment Management initiatives as outlined in the 1994 City of Wanneroo Drainage Study. (CJ,CW,W&RC) [High]**
2. **Adopt management practices throughout the Park that do not add to the build up of nutrients and pollutants in the wetland systems, e.g. planting, fertiliser and irrigation management practices based on minimal nutrient loss and irrigation run-off (Section 33). (CALM, CJ,CW) [Ongoing]**
3. **Encourage the installation of reticulated sewerage in surrounding areas that currently have septic tank systems. (CJ,CW,WC) [Medium]**

4. **Protect and re-establish reedbeds and fringing vegetation in disturbed areas (Section 21). (CALM,CJ,CW) [High]**
5. **Discourage adjacent land-use practices which lead to the leaching and run-off of nutrients and pollutants into the wetland system, encourage and facilitate the relocation of inappropriate land uses to more suitable locations. (MFP,CJ,CW) [Medium]**
6. **Provide interpretive material to the community:**
   - **providing background information on the ecology of the Yellagonga wetlands;**
   - **outlining the effects of pollution on the Yellagonga wetlands; and**
   - **discouraging the feeding of waterbirds within the Park. (Section 37). (CJ, CW, CALM) [High]**
7. **Develop and implement a targeted and integrated monitoring program of wetland health. (CALM, CJ,CW) [High]**

15 - Flora and Vegetation

The objective is to protect, conserve, rehabilitate and regenerate local or culturally significant vegetation in the Park.

Disturbance and subsequent weed invasion have modified large areas of local vegetation in the Park. The wetland vegetation is recognised as having high conservation value but, in many areas, is modified by weed invasion and altered water regimes. Woodlands of Flooded Gum (*Eucalyptus rudis*) and freshwater paperbark (*Melaleuca rhaphiophylla*) would once have encircled the wetland but are now fragmented with few intact areas. The emergent aquatic vegetation of local and introduced rushes covers much of the shallow waters with open water beyond.

The Park is becoming increasingly isolated due to a loss of surrounding natural vegetation and increased development. Past uses, roads and infrastructure have fragmented the Park, and disturbances and continuing weed invasion are steadily degrading natural ecosystems. Pressure on the Park is also increasing particularly for a variety of recreational pursuits as well as commercial development. Planning for corridors and links between the Park and other conservation or recreation areas is outlined in Section 24 – Greenway Corridors and Links.

Total flora within the Park has been recorded at 86 native taxa and 24 weeds (plot generated list only, DEP 1996).

Significant flora within the Park includes *Jacksonia sericea* in the dryland communities and *Persicaria lapathifolia* which is present on dry lake beds and is the only place it has been recorded in the Perth metropolitan region (MFP, 1998). Park vegetation is shown on Figure 6.

The vegetation communities present in the Park are described below:

THE UPLAND PLANT COMMUNITIES

The upland vegetation is adapted to the landforms of the Spearwood System with its low fertility and low water holding capacity and the wet winter, dry summer Mediterranean climate. There are few areas of intact dryland vegetation remaining, mainly at the northern end of Lake Joondalup, with even these areas infested to varying degrees by weeds, particularly veldt grass (*Ehrharta calycina*). Significant areas of dryland vegetation still retain a tree canopy but local understorey and ground layers are in poor condition with many areas mown and with a parkland appearance. There are three major upland vegetation communities.

- **Jarrah-Marri-Banksia Open Forest**
  The Jarrah-Marri-Banksia (*Eucalyptus marginata – Corymbia calophylla – Banksia*) Open Forest mainly occurs on the south west and north east areas surrounding Lake Joondalup and in the south in remnant pockets mainly in the south east portions of the wetlands of Lake Joondalup. The mid-storey species usually comprise Banksias with *Banksia attenuata, B. menziesii* and *B. grandis* with the Sheoak *Allocasuarina fraseriana* sometimes present.
- **Tuart-Jarrah-Marri Open Forest**
  The Tuart-Jarrah-Marri (*Eucalyptus gomphocephala – E. marginata – Corymbia calophylla*) Open Forest occurs mainly on the north east side of Lake Joondalup with remnant patches amongst previously cleared areas to the west of the wetlands north of Whitfords Avenue.
- **Scattered Tuarts**
  Scattered Tuarts occur with an understorey of exotic grasses to the east of Walluburnup and Beenyup Swamps and to the north east of Lake Goollelal. (Department of Planning and Urban Development, 1992a)

THE WETLAND PLANT COMMUNITIES

- **Fringing Vegetation**
  The local wetland vegetation on permanently moist soils consists of Flooded Gum (*Eucalyptus rudis*) and fringing paperbark woodland (*Melaleuca rhphiophylla*). Sub storey species include *Acacia cyclops* and *A. saligna* with rushes extending beneath the overstorey in relatively undisturbed areas. The fringing woodland vegetation once would have encircled the wetland but is now fragmented with the best examples found on the western and north western shores of Lake Joondalup. Flooded Gum

woodland is restricted to one of the islands in Lake Joondalup.

Aggressive grass weeds such as Kikuyu (*Pennisetum clandestinum*), Buffalo (*Stenotaphrum secundatum*) and Couch (*Cynodon dactylon*) are vigorously invading wetland fringes in many areas.

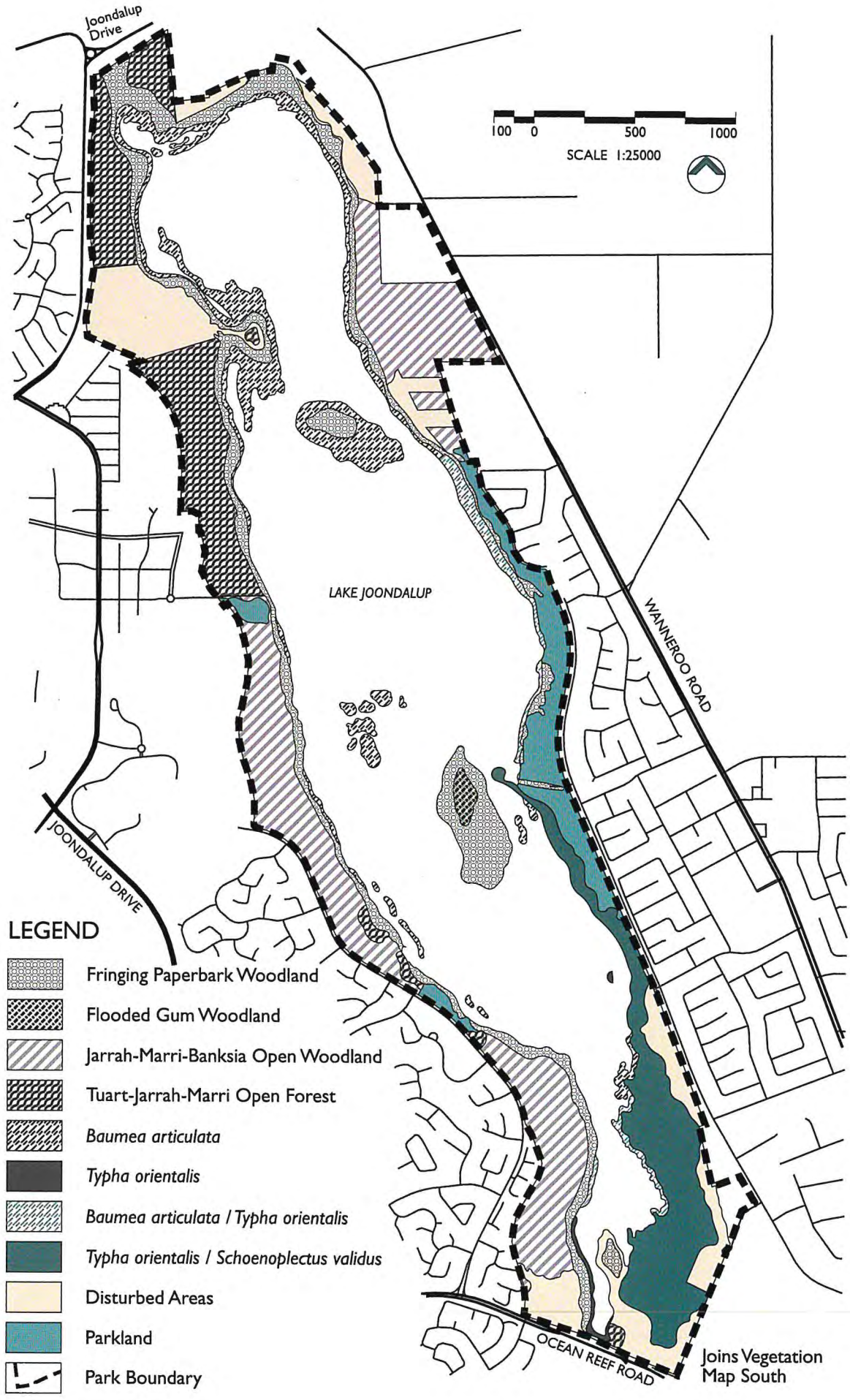
- **Emergent Aquatic Vegetation**
  The emergent aquatic vegetation comprises local rushes often invaded by the non-local Bulrush (*Typha orientalis*). The main emergent aquatic communities comprise:
  a) *Baumea articulata* occurs in monospecific stands 1-2 metres tall, usually dense when in the open and occurs mainly on inlets within Lake Goollelal and in the north of Lake Joondalup.
  b) *Baumea articulata* is mixed with the non-local Bulrush in various proportions in Beenyup Swamp and on the north east fringes of Lake Goollelal.
  c) *Typha orientalis* is mixed with the local rush *Schoenophlectus validus*, in dense stands 1.5 to 3 metres tall, to the south and south east of Lake Joondalup and for much of Walluburnup Swamp and the wetlands south to Whitfords Avenue.
  d) Stands of mixed *Baumea articulata* and *Schoenoplectus validus* occur to the south of Lake Goollelal.
  e) *Typha orientalis* occurs in pure stands on the south east fringe of Lake Joondalup. Bulrush appears to be increasingly impacting on local rush communities.

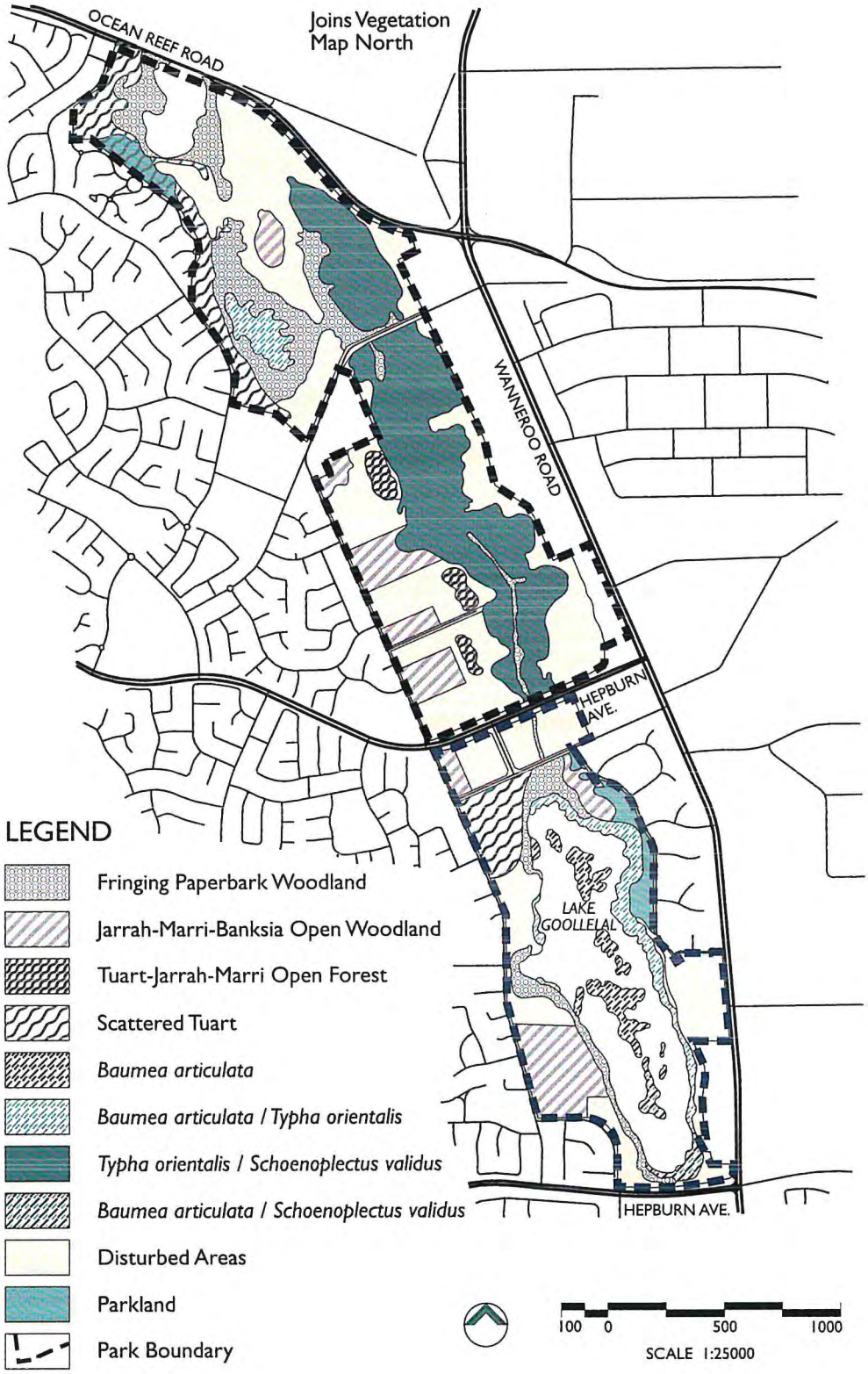
Dieback

To date dieback (*Phytophthora*) is not a significant management issue in the Park. Dieback, a soil borne fungus, could have significant effects on the health of the vegetation in the Park. Dieback spreads downhill with waterflow relatively quickly, however moves uphill more slowly. Preventing the spread of dieback in the Park can be achieved by ensuring vehicle hygiene, closing tracks and limiting access to areas sensitive to infection.

Strategies

1. **Develop and implement a rehabilitation plan. The plan will focus on rehabilitation priorities based on a detailed bushland condition assessment of the Park (Section 21). (CALM, CJ,CW) [High]**
2. **Undertake a weed control plan. This plan is to be co-ordinated with the rehabilitation study and not carried out in isolation (Section 17). (CALM, CJ,CW) [High]**
3. **Ensure local species are used for landscape and amenity plantings. If non-local species are required they should not include invasive species. (CALM, CJ,CW) [Medium]**
4. **Identify and protect culturally significant plants within the Park. (CALM, CJ,CW) [Low]**
5. **Provide interpretive material to local residents and relevant local governments encouraging them to plant local species in areas surrounding the Park (Section 37). (CALM, CJ,CW) [Medium]**
6. **Develop and implement a targeted and integrated monitoring program of bushland condition, changes to vegetation communities and weed proliferation. (CALM, CJ,CW) [High]**


Joondalup Drive
100 0 500 1000
SCALE 1:25000
LAKE JOONDALUP
WANNEROO ROAD
JOONDALUP DRIVE
OCEAN REEF ROAD
Joins Vegetation Map South
LEGEND
Fringing Paperbark Woodland
Flooded Gum Woodland
Jarrah-Marri-Banksia Open Woodland
Tuart-Jarrah-Marri Open Forest
Baumea articulata
Typha orientalis
Baumea articulata / Typha orientalis
Typha orientalis / Schoenoplectus validus
Disturbed Areas
Parkland
Park Boundary



Source: Yellagonga Regional Park Final 1992a

Figure 6 - Vegetation

16 - Fauna

The objective is to maintain viable populations and the current diversity of indigenous fauna species in the Park.

AVIAN FAUNA

Many birds inhabit the woodland and wetland areas of the Park. Of the 122 species recorded in the Park 18 are known to breed in the area (RAOU survey 1996 D, Bamford and Bamford 1990).

The Yellagonga wetlands serve as an important breeding ground and summer refuge for a diverse bird population, many of which are trans-equatorial wading birds. When shallow inland breeding grounds begin to dry out in spring and summer, large concentrations of up to 4600 birds have been present in the Park (Kinnear et al. 1997). The Park's woodlands also provide habitat for a diversity of bushbirds.

A number of migratory birds listed under the Japan-Australia Migratory Birds Agreement (JAMBA) and the China-Australia Migratory Birds Agreement (CAMBA) have been sighted at the Park. Australia is a signatory to these two international agreements which support the conservation of migratory birds and their habitats.

Significant populations of Blue-billed Duck (*Oxyura australis*), Musk Duck (*Biziura lobata*), Hardhead (*Aythya australis*), Splendid (*Malurus splendens*) and Variegated Fairy-wrens (*Malurus lamberti*), Broad-tailed (*Acanthiza apicalis*), Western (*Acanthiza inornata*) and Yellow-rumped Thornbills (*Acanthiza chrysorrhoa*), Weebill (*Smicrornis brevirostris*), Scarlet Robin (*Petroica multicolor*), Golden Whistler (*Pachycephala pectoralis*) and Grey Shrike-thrush (*Colluricincla harmonica*) have all been recorded in the Park (RAOU survey 1996 D).

Three avian fauna species recorded in the Park are listed as threatened species under the Wildlife Conservation Act 1950 - Wildlife Conservation (Specially Protected Fauna) Notice, 1998. Carnaby's Cockatoo (*Calyptorhynchus latirostris*) and the Australian Bittern (*Botaurus poiciloptilus*) are considered rare or likely to become extinct, the Peregrine Falcon (*Falco peregrinus*) is listed as otherwise in need of special protection.

TERRESTRIAL FAUNA

Reptiles and Amphibians

Bamford and Bamford (1990) undertook a preliminary survey of reptiles and amphibians in the Park. Six frog species have been documented in the Park they are the Sandplain Froglet *(Crinia insignifera)*, Glauert's Froglet *(Crinia glauertii)*, Moaning Frog *(Heleioporus eyrei)*, Western Banjo Frog *(Limnodynastes dorsalis)*, Slender Tree Frog *(Litoria adelaidensis)* and the Western Bell Frog *(Litoria moorei)*. The Western Tiger Snake *(Notechis scutatus occidentalis)* and Carpet Python (*Morelia spilota imbricata*) have also been recorded in the Park. Four lizard species have been sighted in the Park although many more are expected to be present and the Oblong Tortoise (*Chelodina oblongata*) has been recorded in the Park.

Mammals

Significant mammal species sighted in the Park include the Quenda or Southern Brown Bandicoot (*Isoodon obesulus fusciventer*), the Echidna (*Tachyglossus aculeatus*), and the Western Brush Wallaby (*Macropus irma*) (Friend 1996D). The native Rakali or Water Rat (*Hydromys chrysogaster)* is also present in the Park (Bamford and Bamford 1990). Other native mammal known to occur in the Park include the Western Grey Kangaroo (*Macropus fuliginosus*) and the Brush-tailed Possum (*Trichosurus vulpecula*).

AQUATIC FAUNA

Fish

There are three fish species, within Yellagonga Regional Park - the Native Goby (*Pseudogobius olorum*) and two introduced species, the Mosquito Fish (*Gambesia holborrki*) and the European Carp (*Cyprinus carpio*) (Bamford pers. comm., 1999).

INVERTEBRATES

Kinnear et al. (1997) studied the water chemistry and aquatic fauna of the Yellagonga wetlands. This study identified 12 species of microcrustacean species within the wetlands with the southern section of Lake Joondalup and Beenyup Swamp having the highest species richness which is linked to tolerance of eutrophic conditions. A total of 121 macroinvertebrate taxa have been identified from the Yellagonga wetlands, an underestimate of the true species diversity, with substantial differences in the distribution of taxa between the wetland sites. The diversity of macro invertebrates is at least partly, if not largely, a result of nutrient enrichment (Kinnear et al. 1997).

Invertebrates within the Park such as insects and spiders have not been studied in detail. It is however recognised that mosquitoes, midge, ants, butterflies, dragon flies, damsel flies and grasshoppers are present in the Park.

Strategies

1. **Develop and implement a targeted and integrated monitoring program of the fauna within the Park. The program should focus on Fauna Populations and Species Diversity. (CALM, CJ,CW, Educational Institutions, WA Museum, Birds Australia) [High]**

2. **Identify seasonal mowing areas and areas not to be mown to preserve habitat and breeding sites. (CALM, CJ,CW) [High]**
3. **Provide interpretive material which:**
   - **promotes an understanding and appreciation of the Park's fauna;**
   - **discourages the artificial feeding of birds;**
   - **educates local residents about the effects of the dumping of 'exotic' animals and fish in the wetlands systems;**
   - **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. (Sections 37) (CALM, CJ,CW) [High]**
4. **Ensure recreation uses are consistent with the protection and management of fauna, e.g. dog walking (Section 27). (CALM, CJ,CW) [Ongoing]**

17 - Weeds

The objective is to minimise the impact of all weeds on biodiversity within the Park using methods compatible with the conservation of the natural environment.

A weed is defined as a plant or species growing out of place. They may originate from within a region, interstate or overseas and may or may not be declared under the Agriculture and Related Resources Protection Act 1976. The presence of weeds is a major problem within the Park. The area occupied by weeds continues to grow and unless controlled may lead to the eventual demise of the local vegetation.

There are many reasons for the presence of weeds in the Park. These include past land uses such as clearing and developing pasture for grazing; soil disturbance from vehicle access; construction of paths and other facilities or drainage channels which allow weeds to establish. It should also be noted that frequent fires promote the growth of weeds. Drainage outlets that carry stormwater from adjoining residential areas assist the spread of weeds to the detriment of the existing vegetation. Garden refuse dumped in the Park introduces many plants that vigorously compete with native vegetation. The dumping of aquarium contents in the lakes and wetlands can lead to the spread of aquatic weeds. Grasses used for amenity purposes in parkland settings can invade remnant vegetation.

Weeds appear to be spreading and are impacting on most native ecosystems. In particular Veldt Grass is invading upland communities. Couch, Buffalo and Kikuyu are impacting on the riparian fringe and Bulrush is impacting on emergent native vegetation. In addition, there are many weeds currently localised, such as Pampass Grass (*Cortaderia selloana*) and Arum Lily (*Zantedeschia aethiopica*) which have potential to significantly impact on the Park. Current control works are concentrating on Blackberry (*Rubus* sp.), Fennel (*Foeniculum vulgare*), Pampas, Castor Oil Bush (*Ricinus communis*) and Arum Lily. A survey of weeds found within Yellagonga Regional Park has been carried out (Sage 1997).

A non-local plant species, Bulrush (*Typha orientalis*) has invaded some sections of the Park. There are significant rush beds within Lake Goollelal and the northern part of Lake Joondalup which are currently largely weed free or have a low incidence of Bulrush. These areas are considered to have very high nature conservation values. It is important that largely weed free areas are identified, maintained and expanded.

Whilst Bulrush is an introduced species, it is recognised that it provides habitat for native fauna (in particular waterbirds), and performs a number of valuable functions. Bulrush stands may also filter and store quantities of nutrients, thus helping to control outbreaks of blue-green algae (see Section 14). Bulrush will colonise areas given the right conditions and then stabilise. Unless Bulrush appears to be replacing an entire stand of local species or is covering the entire wetland, it should be left to complement the existing communities. Bulrush will continue to colonise areas if conditions remain favourable, its removal from the Park therefore needs to be carefully considered.

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, as side effects such as those on native plants or habitat, or the pollution of water bodies, may rule out the use of some techniques. There are also financial constraints on the amount of weed control that can be carried out. When undertaking weed control in the Park, CALM is guided by Policy Statement No. 14 Weeds on CALM Land.

Weed control can greatly benefit from community involvement. Management has only limited resources and weed control can be very labour intensive. Co-ordinated community involvement in eradication or control programs and replanting is highly desirable.

Strategies

1. **Prepare and implement a weed control plan in accordance with the Environmental Weed Strategy developed by the Department of Conservation and Land Management. The plan will:**
   - **prioritise and control weed species according to invasiveness, distribution and environmental impacts;**
   - **identify largely weed free areas, maintain these areas, and conduct weed control works out from these areas;**

- **be co-ordinated with a rehabilitation strategy and not carried out in isolation. (CALM) [High]**

2. **Set boundaries for grass areas used for recreation and control the spread of grasses outside these areas. (CALM, CJ,CW) [High]**
3. **Use interpretive material to inform the community about the affects of dumping rubbish and garden refuse in the Park. The community should be informed that dumping aquarium contents in the local drainage system may lead to the proliferation of aquatic weed problems (Section 37). (CALM, CJ,CW) [Medium]**
4. **Liaise with the City of Joondalup and City of Wanneroo regarding weed infestations and control methods in drains that flow into the Park (Section 33). (CALM, CJ,CW) [Medium]**
5. **Monitor the extent of weed distribution and abundance in the Park as part of monitoring bushland condition. Relate results to previous studies to monitor weed spread. (CALM) [Ongoing]**

18 - Fire

The objectives are to protect people, property and natural values of the Park, by minimising the impact of unplanned fire.

Wildfire is a significant risk within Yellagonga Regional Park. Large areas of local upland vegetation and a pine plantation adjoining Lake Joondalup to the north comprise significant fire hazards. In wetland areas, heavy infestations of Bulrush (*Typha orientalis*) constitute a significant fire hazard. Fires in Bulrush are extremely difficult to control and can cause severe damage to fringing paperbark vegetation.

Increasing urbanisation and visitor use of the Park are likely to increase the incidence of unplanned fire, as has been experienced in other bushland areas in the Perth metropolitan area. It is however recognised that well controlled visitor access can reduce the incidence of unplanned fire (see Section 28).

Wild fires need to be avoided in the Park because they threaten human life, property and nature conservation values. Wild fires in wetland areas will severely inhibit the establishment of paperbark vegetation and lead to an even greater dominance of Bulrush. Fire activity encourages the invasion of Bulrush in a wetland area because it regenerates far quicker than other local rush species. Bulrush is highly flammable in late summer and early autumn when most of the mature leaves have died. If a fire occurs during this period permanent damage to stands is minimal since the plants are dormant.

Selective prescribed burning may be considered for the protection of Park values and the protection of the special reproductive characteristics of fire sensitive plants and to enhance biological diversity.

Fires that occur in the Park need to be controlled quickly and the frequency of fires reduced. Yellagonga Regional Park is gazetted within the Fire and Emergency Service (FESA) control zone, therefore fire suppression is their responsibility. However, pre-suppression and post-suppression activities are the responsibility of the relevant managing agency. When managing fire, the Department of Conservation and Land Management is guided by Policy Statement No.19 Fire Management (1987).

A fire response plan has been developed by CALM in conjunction with FESA and the relevant local governments to help control unplanned fire. The fire response plan is consistent CALM's Fire Management Policy Statement No.19.

Strategies

1. **Implement the Park's fire response plan that outlines practices such as:**
   - **fire control actions and strategies that protect environmentally sensitive areas from unplanned fire;**
   - **detailing pre-suppression activities including reducing fuel loads by mowing large open grassed areas. Mown areas should be delineated so that mowing practices do not inhibit natural regeneration and fauna habitat;**
   - **maintaining a fire record system of all fires in the Park including date and cause;**
   - **ensuring an effective network of firebreaks is maintained. (CALM, CJ,CW) [High]**
2. **Co-ordinate rehabilitation works with fire prevention requirements. Fire prevention will be a major component of the rehabilitation plan (Section 21). (CALM, CJ,CW) [High]**
3. **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 28). (CALM, CJ,CW) [Ongoing]**

19 - Midge and Mosquito Control

The objective is to minimise the negative effects of mosquito and midge populations in a manner that has minimal environmental and social impacts.

MIDGE

Midge inhabit the wetlands of Yellagonga Regional Park and have been known to be a nuisance to surrounding residents. A previous survey of residents living near Lake Goollelal found different levels of midge nuisance, however, no apparent trend to explain the difference was evident (Davis, Harrington, Pinder, 1989). Research shows that high midge densities occur as a response to wetland nutrient enrichment and that midge problems are a symptom of a disturbed system and an effect of poor water (Pinder, Trayler, Davis, 1991). Poor water quality can be attributed to factors occurring throughout the catchment of the Yellagonga wetlands (see Section 14).

The Cities of Joondalup and Wanneroo have established an Integrated Catchment Management Group (ICMG) and prepared a Midge Strategy and Action Plan for the Yellagonga wetlands. The ICMG is investigating treatment options for Lake Joondalup in the short-term with the intent to develop a longer-term strategy to improve the water quality of Lake Joondalup and Lake Goollelal. The ICMG is recommending the establishment of an Integrated Catchment Management program to achieve the future sustainable use of the natural resources within the catchment area of the Yellagonga wetlands. CALM supports these initiatives to help control midge and will assist in the rehabilitation and management of the Yellagonga wetlands.

The community will also play a significant role in establishing rehabilitation programs and assisting in water sampling of the wetlands. It is hoped that with the involvement of the community at this level, an education program can be developed within the community to control the use of nutrient based products such as fertilisers.

MOSQUITOES

Mosquitoes are also present around Yellagonga Regional Park. The City of Joondalup and City of Wanneroo undertake mosquito monitoring by trapping throughout the Park and on occasions, trapping has yielded large numbers of *Culex annulirostris* and *Coquillitedia linealis* (over 100 per trap per night). When appropriate, the City of Joondalup and City of Wanneroo undertakes mosquito spraying. Both species of mosquitoes are very common around freshwater lakes and have been shown to be vectors of Ross River Virus. Australia wide, it is generally accepted that significant nuisance occurs when EVS/CO2 mosquito traps yield in excess of 100 biting insects per trap (Health Department of Western Australia, 1996).

The Health Department of WA administers a mosquito control program that subsidises Contiguous Local Authority Groups (CLAGs) that have been identified as having locally contracted mosquito-borne viruses, to control mosquitoes and protect from viruses. The Cities of Joondalup and Wanneroo would have to demonstrate known cases of locally contracted mosquito borne disease before qualifying for this assistance.

The effectiveness of the mosquito control program however does have ramifications for the natural environment. Constant monitoring of breeding sites requires vehicle access to many sensitive sections of the Park. Constant access can cause areas to degrade and may contribute to creation of breeding habitat for mosquitoes. The NPNCA also has a formal policy on mosquito control.

Strategies

1. **Implement the City of Joondalup and City of Wanneroo Midge Strategy. (CJ,CW, CALM) [High]**
2. **Investigate whether mosquitoes are a significant nuisance to surrounding residents. If they are a significant nuisance, implement a control strategy. (HDWA, CJ,CW) [Medium]**
3. **Review mosquito control practises annually for effectiveness in reducing pest numbers. (HDWA ,CJ,CW) [Ongoing]**
4. **Continue to seek alternatives to chemical pest control that are compatible with the ecological values of the Park. (CALM, CJ,CW) [Ongoing]**

20 - Pets and Introduced Animals

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

PETS

Pets such as dogs, cats and horses are impacting on the natural environment within the Park. Their management needs to be strengthened.

Cats from nearby residences are impacting on native fauna and need to be controlled. Domestic cats are likely to hunt for birds, reptiles and other creatures. Cat owners should be encouraged to keep them at home, especially at night and have them de-sexed to help control feral populations.

Horses are degrading the environment around areas in which they are agisted and need to be removed. Horses

have been agisted in the central portion of the Park for many years. Because of the temporary nature of this land use, the quality of facilities such as fencing, stables and shelters is poor and presents a very dilapidated appearance. Wetland areas extend through the centre of the agistment area at Della Road, providing year round green fodder. Remnants of the former wetland rushes together with melaleucas are found here, however, pasture grasses and particularly kikuyu grass dominate the local plants.

An existing trotting training track located adjacent to Woodvale Drive is used by local horse trainers. With the removal of horse agistment from the Park, there is likely to be little demand for the on-going use of the trotting track. Future use of the site will require further investigation by the Park's managing agencies.

Dog walking is a common activity within the Park and is legitimate in certain areas and under specified conditions.

The City of Joondalup's and City of Wanneroo's local laws on dogs apply to reserves vested in them, and nominate particular reserves where dogs are prohibited. For all other reserves vested with both local governments, dogs are permitted, provided they are either on a leash, or if not on a leash, are able to be effectively controlled by the accompanying person. Given Yellagonga Regional Park's high conservation value, the need to protect the Park's natural fauna and the opportunity to exercise dogs off leads in other reserves in the Cities, it is considered appropriate that dogs will not be permitted in Areas of the Park zoned for Conservation and Protection (see Figure 4 – Management Zones and Areas). Other areas of the Park where dogs will not be permitted are as follows:

- Area 3 – The Pine Plantation, dogs will not be permitted due to site management constraints;
- Area 4 – Lot 1, dogs will prohibited due to the protection of Park fauna and management requirements; and
- Area 5 – Neil Hawkins Park, dogs will not be permitted for the conservation of Park fauna and nuisance to Park visitors.

Dogs will only be permitted in other Park areas provided they are on a leash and under effective control at all times.

INTRODUCED ANIMALS

Introduced animals such as feral cats, foxes, rabbits, fish and others occur in the Park but precise numbers are not known. All these animals have a detrimental effect on the Park's environment and their control and removal will help protect the Park's fauna and flora. Hybridisation and competition between domestic and native ducks is believed to be a threat to the survival of native ducks.

Park visitors will be discouraged from feeding ducks and other birds through educational signs (see Section 37). 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 (*Apix mellifera*) is present in the Park and can have detrimental effects on native bees and vegetation. Competition between native and honeybees and other native pollinators for flora resources usually favours the more aggressive foraging of the introduced bee, resulting in a decline of native bees. Other possible effects are inefficient pollination of some local plants, destruction of flowers and hybridisation of some native plant species by cross-pollination of different native species. This is not the case with native bees.

Strategies

1. **Remove horse agistment from within the Park. (CALM) [Medium]**
2. **Exclude dogs from areas zoned as Conservation and Protection as well as areas 3,4 and 5. For all other areas of the park ensure dogs are on a leash and under control at all times. (CALM, CJ,CW) [High]**
3. **Provide dog excreta bins and signs where appropriate. (CALM,CJ,CW) [Medium]**
4. **Use interpretive material to inform the community about the adverse effects of pets and introduced animals on native fauna (Section 37). (CALM, CJ,CW) [High]**

21 - Rehabilitation

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

Yellagonga Regional Park is extensively degraded by past uses. A number of previously developed, or rural areas have been included in the Park particularly in the south of the Park near Walluburnup and Beenyup Swamps, and Lake Goollelal. Extensive areas of non-local grassland are currently managed by slashing. It is difficult to restore severely degraded sites to natural habitat, however considerable conservation gains can be made if a range of local overstorey and understorey species are used for revegetation.

A variety of techniques are available for landscape rehabilitation with the most appropriate being determined by the specific circumstances encountered. All plant material or seed used in rehabilitation works should originate from the Park or the nearest viable

seed source, in order to conserve the genetic integrity of the vegetation communities.

Seed collection from within the Park will generally only be permitted for rehabilitation projects within, or directly impacting upon the Park.

Rehabilitation of areas fringing the lakes and wetlands will be given a high priority. Local fringing vegetation helps create a more natural habitat and nutrient inputs are reduced through filtration and storage (see Section 14).

Given Yellagonga Regional Park's urban surroundings, an important consideration in Park rehabilitation will be the maintenance of views. Lower vegetation types could be used to maintain views over the wetlands and lakes. Local residents should be informed of proposed revegetation works within the Park (see Section 23).

Park rehabilitation will be challenging due to infertile soils and dense non-local grass and weed covers. This presents an opportunity to try cost effective techniques such as direct seeding and to make use of volunteer support in rehabilitation programs. Local residents, community groups and educational institutions should be encouraged to be actively involved in rehabilitation works. These activities are to be co-ordinated by the joint managers of the Park (see Section 39).

Strategies

1. **Prepare and implement a rehabilitation plan prioritising proposed works. The highest priority should be the rehabilitation of fringing wetland vegetation with an additional buffer of upland vegetation. (CALM, CJ,CW) [High]**
2. **Co-ordinate rehabilitation with weed control, fire protection and recreation facility and trail development at the planning, design and implementation stages. (CALM, CJ,CW) [Ongoing]**
3. **Co-ordinate rehabilitation works between all the land managers and relevant community groups. (CALM, CJ,CW) [Ongoing]**
4. **Use locally collected seed (where possible) for propagating plants or for direct seeding and ensure mulch and soil used in rehabilitation works does not contain unwanted seed. (CALM, CJ,CW) [Ongoing]**

22 - Cultural Heritage

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

ABORIGINAL ASSOCIATION AND USE

Research undertaken by Seddon (1972) shows that the Perth region supported three tribal districts prior to European occupation. The land north of the Swan River was the Mooro District with a tribe of 28 people led by Yellagonga.

The extent of the Mooro district stretched from the coast in the west to Ellen Brook in the east, and from the Swan River in the south to Gingin Brook or lower Moore River in the north (Bourke, 1987).

The main camp for the Mooro people was at Mt. Eliza, undoubtedly the tribe would have moved through the district in search of food.

The arrival of European settlers displaced the Mooro people north from their head camp at Mt. Eliza. Yellagonga and his people initially retreated to Lake Monger and set up camp there. Later they withdrew to Lake Joondalup (Brittain 1990).

Brittain suggests the coming together of the two cultures was a soul shattering experience for the Aborigines. It marked the destruction of one society by another in which the beliefs and spirituality of the Aborigines were almost overwhelmed by the sophisticated and patronising British settlers.

In the early period of settlement, relationships between the two communities were good. However, the inevitable cultural misunderstandings and competing demand for the land ultimately led to conflict. After an attack on the Aborigines in 1833 by a Tasmanian settler, Yellagonga's nephew, Yagan, from south of the Swan River, began attacking settlers and their property. Outlawed, he sought refuge in Yellagonga's territory, possibly around Lake Joondalup (Brittain 1990).

With the rapid demise of the Aboriginal lifestyle between 1829 and 1835, the subdivision of Lake Joondalup's shores from 1838, the establishment of the Wesleyan Mission Farm in 1844, and droving from 1850, it was unlikely that the area surrounding the Yellagonga

wetlands would have remained an Aborigine camp for long (Brittain 1990).

Native Title Amendment Act 1998
Some of the lands that comprise Yellagonga Regional Park are subject to two native title claims. In accordance with the Native Title Amendment Act 1998 (NTAA) future public works constructed on all reserved lands and waters managed by CALM will need to be notified in writing.

Parties that require notification are:
- Representative Aboriginal bodies;
- Registered native title bodies (corporate) and registered native title claimants for the CALM land/waters 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 NTAA to include buildings, structures which are a fixture, 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. The NTAA's intention to preserve the natural environment will probably cause conservation parks, regional parks, nature reserves, conservation/recreation purpose Section 5(g) reserves, marine reserves and marine nature reserves to be included in this requirement.

Aboriginal sites within and adjoining Yellagonga Regional Park
Declared Aboriginal sites within and adjoining Yellagonga Regional Park are :

- S00160 – Lake Joondalup West
- S01288 – Lake Joondalup North-West
- S02539 – Bonorin Hill
- S02187 – Lake Joondalup
- S02321 – Lake Joondalup South-West
- S02538 – Joondalup Caves
- S02572 – Joondalup Waugal Egg
- S02186 – Lake Goollelal
- S02573 – Joondalup Drive Trees
- S0437 – West Walluburnup Swamp
- S02279 – Wanneroo Scar Tree

NON ABORIGINAL HERITAGE

The Burra Charter, adopted by the Australian International Council on Monuments and Sites in 1979, provides the basis for management by CALM of places of cultural significance. It defines conservation principles, processes and practises for application to places of cultural significance.

The area around Yellagonga Regional Park attracted the attention of the settlers as colonists set out to find land to cultivate. Brittain (1987) notes that John Butler passed east of Lake Joondalup in 1834 observing that the land was worth surveying. This was carried out in 1838 and the land was subsequently leased.

Lieutenant George Grey explored the area in 1838 and camped at a lake fifteen miles from Perth which was called Mooloore by the Aborigines. He was visited by Aborigines who informed him that 'although the lake is called Mooloore, the name of the land we are sitting on is called 'Doondalup' (Daniel and Cockman, 1979).

The east side of Lake Goollelal became the site for the Wesleyan Mission Farm from 1844 to 1852. The aim of the Farm was to encourage the Aboriginal people to learn agricultural skills. By 1852 the Mission had failed and taken up better opportunities in York, though the Mission Farm remained occupied. Aboriginal people who died whilst on the Mission were buried on the high ground to the west side of Lake Goollelal, the exact location however is no longer known.

James Cockman and his wife are believed to have been among the first settlers in Wanneroo around 1850. It would appear that the first Cockman House was built near Walluburnup Swamp, however it became vermin infested (Daniel and Cockman 1979) and was burnt down. The existing Cockman House near the corner of Wanneroo Road and Ocean Reef Road was built around 1870 (DPUD, 1992a).

The area, called Wanneru, became a gazetted district of the Perth Roads Board in 1871 and road construction began using jarrah blocks. Pastoral leases with a minimum of 1240 hectares were taken up in the 1880s to protect stock grazing. In 1889 the Sorrento to Dongara Stock Route was gazetted. The route was approximately 800m wide and passed to the west of Lake Joondalup. This formalised the established route by which cattle and sheep were being brought to the Perth markets from the Wanneroo area (DPUD, 1992a).

In 1906, land beside Lake Joondalup was acquired by the State government and subdivided into eighty, one-hectare blocks and gazetted as the town of 'Waneru'. The Wanneroo area became important for market gardening and vineyards. Many of the market gardens were established around the wetland system where the soils were more fertile and water readily available. Some market gardening still exists immediately adjacent to and within the Park (DPUD, 1992a).

Wanneroo Township was supplied with electricity in 1954 and the area grew rapidly with urban expansion from the south. Wanneroo was proclaimed a city in 1986. Further historical information is contained in Brittain (1990).

Non Aboriginal historical sites within and adjoining Yellagonga Regional Park
- Neil Hawkins Park – this land once formed part of a stock route which was pioneered in 1854 and passed along the western side of Lake Joondalup.
- Quarry Ramble Lookout – during the 1920s the site was quarried for limestone used in building and road construction. Limestone was also extracted to improve the soil quality for agriculture.
- Perry's Paddock – named after Jack Perry, a grazier, who bred racehorses on the property at the turn of the 20th century. The site became a popular venue for big sports, horse races and picnic days. The limestone ruins on the site include a two-storey shed and single room attached cottage (in the English vernacular style) as well as a cottage

that has been restored. In 1992, the City of Wanneroo relocated the Wanneroo Primary School to Perry's Paddock.

- Cockman House – is the oldest surviving residence in Wanneroo. The limestone homestead was built in the early 1870s and has 450mm thick walls.
- Buckingham House – named after John Buckingham who constructed the four bedroom, limestone cottage in the 1880s. Buckingham lived on his 40ha property for some years before being granted legal title. Today the house operates as a "Pioneer Activity Centre" for local school children.
- Chitty House – this limestone dwelling was built in the 1870s by Mr H.W. Clarkson. He was one of the first settlers and an office holder in the early years of the Agricultural Society. Chitty House is not open to the public.
- Ashby House – was constructed for Charles Ashby and his family between 1910 and 1915. Similar to Buckingham House, it is typical of limestone cottages of the era. Charles Ashby was elected as a member of the Wanneroo Road Board on four occasions between 1915 and 1940.
- Luisini Winery – built in 1929, provides an example of the early wine industry which reflects the predominant activity in the area prior to urban expansion.
- The Wesleyan Mission Farm – established by the Reverend John Smithies was built on the eastern shore of Lake Goollelal in 1844. The aim of the Mission was to encourage the Aboriginal people to learn agricultural skills.

Given Yellagonga Regional Park holds significance to both Aboriginal and non Aboriginal people it is crucial that management protects the dual association of two radically different peoples. Where appropriate, areas of cultural heritage value will be presented to Park visitors so they can appreciate the rich cultural and historical background of the Park.

Heritage Trails within Yellagonga Regional Park

- Lake Joondalup Trail – A 27km self-guided walk/drive trail, begins at Neil Hawkins Park and traces the development of Wanneroo around the Lake Joondalup.
- Yaberoo – Budjara Heritage Trail – A 28km walk trail from Lake Joondalup in Wanneroo through Neerabup National Park, highlights features of Aboriginal and non Aboriginal historical significance. The trail is based on the movement of a local Aboriginal group that included Yellagonga. Tracks link the lakes and wetlands of the coastal plain, and were later used as a stock route.

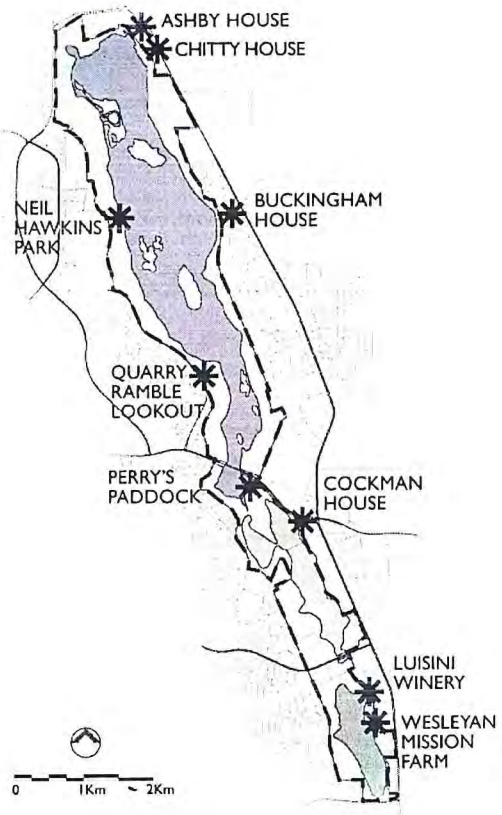


Figure 7 - Non Aboriginal Heritage Sites

Strategies

1. **Ensure management obligations are fulfilled according to the Aboriginal Heritage Act 1972 -1984 and the Native Title Amendment Act 1998 before any planning or public works take place. (CALM, CJ,CW) [Ongoing]**
2. **Incorporate information on Aboriginal and non Aboriginal history of the Park into interpretive material where appropriate (Section 37). (CALM, CJ,CW) [High]**
3. **Incorporate the Heritage Trails where possible into the proposed path network (Section 28). (CALM, CJ,CW) [High]**
4. **Liaise with Aboriginal and historic groups to determine their interests and possible involvement in the Park. (CALM, CJ,CW) [Medium]**
5. **Nominate significant sites for heritage listing on either the Municipal Heritage Inventory, or State and National Heritage Lists. (CJ,CW, CALM) [Medium]**
6. **Manage historic sites in accordance with the ICOMOS Burra Charter and in consultation with other appropriate conservation bodies, such as the WA Museum, National Trust, Australian Heritage Commission and historical societies. (CALM, CJ,CW) [Medium]**

23 - Park Aesthetics and Landscape Amenity

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

LANDSCAPE DESCRIPTION

The Park lies within the Swan Coastal Plain landscape character type (CALM, Reading the Remote, Landscape Character Types of Western Australia 1994). The Coastal Plain gently slopes westwards from the Darling Scarp to the Indian Ocean. The Park is located approximately 6 kilometers from the coastline.

Landscapes range from the open water bodies of Lake Joondalup and Lake Goollelal to dense woodland areas and fringing paperbark forests to open parkland. Additionally, cultural landscapes such as Perry's Paddock, Luisini Winery and Cockman House provide stimulating contrasts to the surrounding urban development. Most areas of Yellagonga Regional Park fronting onto open waters have extensive views that are enjoyed and appreciated by Park visitors and local residents.

LANDSCAPE QUALITY

The Park landscape encompasses areas which can be described as being of high, medium, or low visual quality. These categories can be mapped using CALM Visual Landscape Management System 1989. Once mapped, any modifications within and adjacent to the Park can be assessed according to the visual quality rating and the ability of the landscape to incorporate the proposed change.

There are many areas of high scenic quality. Most of these occur in areas zoned Conservation and Protection and include natural areas with water as a major element. Other areas of high scenic quality include well maintained parkland areas.

Areas of low visual quality would include, large cleared areas, highly disturbed areas (with dumped rubbish or weed infestation) built structures such as drainage outlets, back fences of houses, power lines and other utilities in the Park. Degraded and/or inappropriate structures are found within the Park. These structures detract from the enjoyment of the lakeside environment and need upgrading, replacing or screening to contribute positively to park amenity. Other areas of the Park are visually impacted by incompatible adjacent land uses or disturbed by past land use and in need of rehabilitation. The provision of adequate shade is also an issue that has a major impact on the quality of visitor experience and landscape amenity.

LANDSCAPE CHARACTER

Maintaining or improving the natural and cultural landscapes of the Park are integral components of the effective management of the Park. While this means protecting natural areas, in other instances this involves rehabilitating modified landscapes of the Park. Rehabilitation works should use local plant species grown from locally collected seed or from the nearest viable seed source. The created landscape should resemble the character of the original landscape even if it has not been possible to replicate the landscape due to lack of technology or resources. View corridors, incorporating the use of low vegetation, should be considered in rehabilitation planning (see Section 21). Planting only local plant species does not apply to historical sites provided that particular plants are not invasive.

Strategies

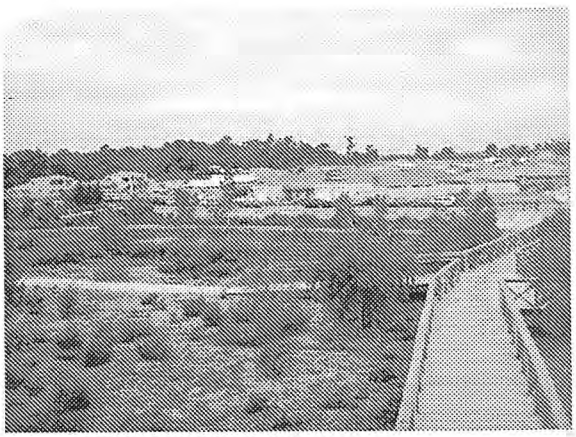
1. **Assess the visual impacts of development proposals and advertising signs within and on the periphery of the Park, so that adverse visual impacts can be minimised. (CALM,CJ,CW) [Ongoing]**

2. **Liaise with Infrastructure providers, the City of Joondalup, the City of Wanneroo and other authorities before significant works are carried out in the Park. (CALM, CJ,CW, Western Power, WC) [Ongoing]**

3. **Encourage the incorporation of appropriate community art at selected locations. (CALM, CJ,CW) [Low]**

24 - Greenway Corridors and Links

The objectives are to manage Yellagonga Regional Park consistently with Greenway principles and to encourage appropriate management of corridors and linkages between the Park and other conservation or recreation areas.



Yellagonga Regional Park is a relatively thin lineal strip situated within the rapidly expanding northern urban

corridor of Perth. With a substantial Park perimeter in relation to area, relatively undisturbed landscapes within the Park, are particularly vulnerable to the pressures of adjacent land uses. Linkages between and within the Park, to adjoining areas of ecological significance are important to maintain (or develop as necessary). This is necessary to ensure the diversity and vigour of the Park's ecological systems and to help integrate the Park within the broader urban landscape.

Major arterial roads limit linkages between various parts of the Park. Major roads divide the Park at Ocean Reef Road, Whitfords Avenue and at Woodvale Drive. Burns Beach Road forms a barrier between Neerabup National Park and Yellagonga Regional Park. Hepburn Avenue is located on the southern boundary of the Park.

In the regional context, there are a number of "green" areas within close proximity of the Park. To the north are Neerabup and Yanchep National Parks. To the east are Mariginiup Lake, Jandabup Lake, Gnangara Park and Whiteman Park. To the south are Kingsway Reserve and Marangaroo Golf Course. And to the west are the Woodvale Nature Reserve, Craigie Open Space and Pinaroo Valley Memorial Park.

A study of Perth's Greenways has identified a number of proposed greenway corridors linking to Yellagonga Regional Park. They are as follows:

2	Northwest Wetland Strip
4	Burns Beach Road
5	Ocean Reef Road – Marmion Avenue
6	Badgerup Lake – Gnangara Lake
9	Mitchell Freeway / Railway
10	Hepburn Avenue – Alexander Drive – Coast
17	Lake Mariginup – Yellagonga Regional Park
41	Yellagonga Regional Park – Melaleuca Park

The use of local plants in landscaping road reserves together with purpose designed animal underpasses and overpasses as well as fauna warning signs can assist to minimise the impact of major roads on the movement of fauna.

The type of interface between the Park and adjoining land uses plays a major role in insulating or exposing (as the case may be) the Park to undesirable impacts of those areas. The spread of invasive weed species and non-local species can be minimised by the creation of appropriate buffers where none exist and by the planting of local species in existing areas.

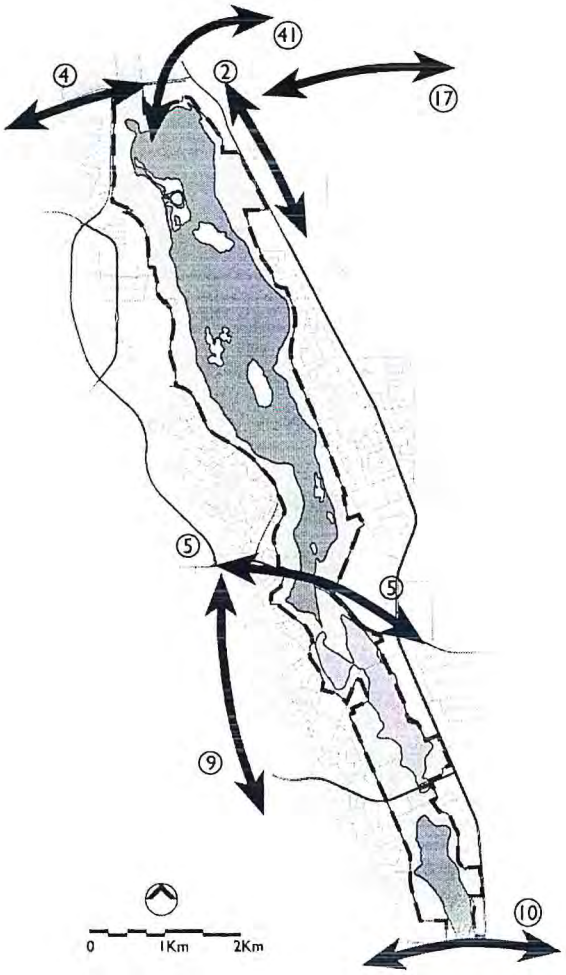


Figure 8 - Greenway Corridors and Links

Strategies

1. **Develop a list of park compatible plants to be provided to local residents who live nearby the Park and the Cities of Joondalup and Wanneroo. Local plant species should be used in landscaping road reserves near the Park. (CALM) [Medium]**
2. **Encourage future providers of transport and power services to adopt "wildlife friendly" designs, and management practices. (CALM, CJ,CW) [Medium]**
3. **Complete structure planning for areas surrounding the Park. (MFP, CJ,CW) [High]**
4. **Liaise with adjoining landowners involved with proposed Greenways near Yellagonga Regional Park to develop a co-ordinated and complementary approach to management. (CALM, CJ,CW, MFP) [Medium]**

D. RECREATION

25 - Principal Recreation Directions

RECREATION GOAL

Manage for recreation and leisure by providing high quality recreation opportunities which are compatible with the protection and enhancement of Park values.

RECREATION STRATEGY

As a large open space surrounded by increasing urban development, the Park is in high demand as a recreation facility. The strategy for recreation management is to encourage appropriate use of the Park that is compatible to the guiding principles discussed below. In planning for recreation, the Park will be considered as a regional resource and not just available to local visitors.

RECREATION GUIDING PRINCIPLES

1. Preservation of the Values of the Land Itself
Natural systems (including landscapes, particular sites, biota) should be able to sustain the recreation which is occurring or proposed. Recreation should be focused in public use areas of the Park, zoned for recreation. The intensity of recreational activities may need to be controlled to ensure it does not destroy the value and nature of the activity.

2. Consistency of Recreation with Reserve Purpose
Recreational activities should be compatible with the assigned purpose and management zoning 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 impair other forms of acceptable use or jeopardise the safety of other visitors should be specifically managed, directed to more appropriate places or not permitted. Priority will be given to low impact activities and those that increase awareness, appreciation and understanding of the natural environment.

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.

26 - 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. Recreation facilities should complement the surrounding areas of the Park focussing on nature-based opportunities.

Existing recreation sites within the Regional Park are shown in Figure 9:

1. Banyandah Park for dispersed informal recreation;
2. Neil Hawkins Park for picnicking, informal play, walking and nature watching;
3. Joondalup Park and Scenic Drive Park for sports activities including Australian rules football, soccer and informal play;
4. Wanneroo Recreation Centre for indoor basketball, badminton, roller-skating, community meetings and informal play;
5. Picnic Cove Park for play equipment and dispersed recreation activities;
6. Beenyup Park for cycling, walking, nature observation and dispersed recreation activities;
7. Perry's Paddock for outdoor events and cultural interpretation;
8. Cockman House for cultural activities;
9. John Smithies Park for dispersed informal recreation;
10. Bindaree Park for picnicking, informal play and exercise routines.

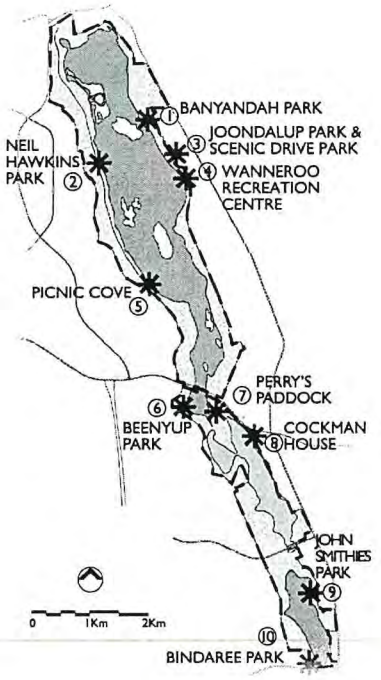


Figure 9 - Recreation Nodes within Yellagonga Regional Park

The proposed urban expansion for east Wanneroo will substantially increase the demand for recreation facilities in that area. In a similar manner to Neil Hawkins Park, which presently provides a focal point for visitors to the western side of Yellagonga Regional Park, it is suggested that recreation nodes be developed on the eastern side of the Park to cater for the expected increase in Park visitors (see Figure 10 - Recreation Masterplan).

RECREATION MASTERPLAN

A recreation masterplan has been prepared to coordinate recreation developments within the Park and allocate appropriate facilities, visitor facilities and services to those areas of the Park best able to accommodate them in a sustainable manner. The design and placement of recreation facilities should not conflict with the values and management of the Park. Developments, where possible, should utilise already degraded sites and be designed in accordance with the relevant Australian Standards.

The masterplan reflects the management zones and land uses described in Section 9 of this Plan. Access, internal circulation and the type of facilities to be provided have been guided by the zoning (Conservation, Natural Environment Use, and Recreation).

The areas of Yellagonga Regional Park zoned as Conservation and Protection will have access limited to dual use paths, walk trails or boardwalks with an emphasis being on the enjoyment of nature. The areas zoned as Natural Environment Use will have greater access with an emphasis on rehabilitation, education and interpretation. The provision of some facilities within these areas is accepted.

The areas designated as Recreation and Sport, and Recreation will be the most intensively used and highly modified sections of the Park. The emphasis will be on providing well-designed recreation areas without detracting from the natural values of the Park. Facility provision for visitors will be concentrated in these areas.

RECREATION OPPORTUNITIES

The recreation masterplan will help ensure that a variety of recreation opportunities are offered in Yellagonga Regional Park and that they will complement those offered in surrounding areas.

Facilities provided at the Park will emphasise the special values of the Park and the different environs. The Recreation Opportunity Spectrum (ROS) is a planning tool that enables managers to provide for the greatest possible range of opportunities in a given area, while limiting unintended incremental development (Stankey and Wood 1982). It does this by identifying a range of recreation classes and the types of experiences, activities and opportunities that are appropriate in each class. Major factors that determine different classes include:

- the level and extent of access;
- the presence or absence of facilities and services;
- the opportunity for social interaction;
- the degree of management of visitor impacts.

Principles of the ROS have been utilised in developing the recreation masterplan.

Strategies

1. **Implement the recreation masterplan that allocates appropriate facilities, visitor facilities and services to those areas of the Park best able to accommodate them in a sustainable manner. (CALM, CJ,CW) [High]**
2. **Provide interpretive material that indicates recreation sites and facilities available in the Park (Section 37). (CALM, CJ,CW) [Medium]**

27 - Visitor Use

The objectives are to ensure that the level of visitor use and behaviour is sustainable, to maintain acceptable levels of visitor satisfaction.

A wide variety of recreation uses and activities occur within Yellagonga Regional Park. Visitor use is concentrated at a number of recreation nodes particularly Neil Hawkins Park, Joondalup Park and the Wanneroo Community Recreation Centre which adjoins Lake Joondalup. Neil Hawkins Park is the most popular destination due to its proximity to the Joondalup City Centre and quality recreation facilities.

The level of visitor use peaks at weekends and holiday times when families visit parkland areas. Important recreational and social events occur within the Park including the annual Perry's Paddock Picnic Day. People visit the Park for a wide range of reasons. It is important to identify those reasons together with the visitor numbers in order to effectively manage the Park.

Strategies

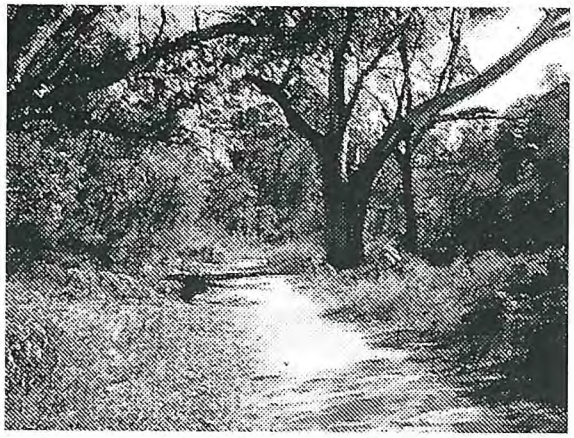
1. **Prepare a communication plan incorporating a sign strategy and interpretive material. Interpretation material should be aimed at:**
   - **promoting visitor use and activities, which are consistent with the protection of Park values and minimise conflicts between Park visitors.**
   - **providing information about the recreation opportunities available in the Park. (CALM) [Medium]**

2. **Ensure Park management has the authority required to regulate control when necessary. (CALM, CJ,CW) [High]**

3. **Develop a monitoring program (social survey) for the Park to gain an understanding of visitor impacts, activities and satisfaction within the Park. Following the survey take appropriate action where necessary. (CALM, CJ,CW) [High]**

28 - Park Access and Circulation

The objective is to establish a safe and convenient path system throughout Yellagonga Regional Park that is consistent with the protection of Park values.



Road Access

As Yellagonga Regional Park exists within a developing urban setting, safe and convenient access to and within the Park is a major issue. The majority of visitors access the Park by private vehicles from several major arterial roads adjoining or dissecting the Park. Ocean Reef Road and Whitfords Avenue dissect the Park east-west while Wanneroo Road and Joondalup Drive flank the Park on the East and West. Burns Beach Road and Hepburn Avenue bound the Park to the north and south respectively

Vehicle access is an important consideration for the Park. Direct access to the main recreation areas is via minor suburban streets, particularly: Boas Avenue, Edgewater Drive, Banyandah Boulevard, Scenic Drive, Timberlane Drive, Woodvale Drive, Duffy Terrace, Mooro Street, Hocking Road, Lakeway Drive, Goollelal Drive and Bindaree Terrace.

Joondalup City Centre is a focal point for public transport with bus and rail services operating frequently. Other train stations within two kilometres of the Park are Currambine, Edgewater and Whitfords. TransPerth operates bus services to areas surrounding the Park with many routes adjoining the Park.

Parking

It will be necessary to develop parking areas to facilitate access to the Park where there is an existing visitor demand or where the provision for new access is planned. The provision of parking facilities in the Park is outlined in the recreation masterplan and will help overcome the undesirable effects of uncontrolled parking and access.

Cycle and Pedestrian Access

An effective path system should have minimal impacts upon the values of the Park, whilst allowing visitors to experience the diverse recreation opportunities and settings within the Park.

Local residents access the Park by cycling and walking, however, the existing cycling and pedestrian network around the Park is inadequate. Although BikeWest has assessed quiet neighbouring suburban streets as good cycling environments, dual use paths only provide limited access to the Park.

Internal access and circulation within Yellagonga Regional Park is also limited. The lack of formal dual use paths restricts circulation and connectivity throughout the Park.

The Yaberoo-Budjara Heritage Trail along the west bank of Lake Joondalup is degraded in sections and difficult to traverse due to its sandy nature. Pedestrians are currently using firebreaks and management tracks to walk throughout the Park.

Informal paths are being created by people seeking new experiences which result in greater disturbances to bushland areas, and lake and wetland edges.

Proposed Park access is shown on Figure 10 – Recreation Masterplan.

Access for All

Access for people with disabilities is severely restricted throughout the Park with appropriate paths and ramps only present at Neil Hawkins Park. The construction of an internal path system will greatly enhance access for people with disability problems.

Maintenance Vehicle Access

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

Management vehicle use within the Park must be justified and strictly controlled. Uncontrolled access has resulted in degradation in some areas. A review of the existing track system will limit the impact of vehicles (see Section 33).

Private Vehicle and Motor Bike Access

Private vehicles, trail bikes and motor bikes are restricted to designated parking areas and access roads. Access outside these areas may endanger other Park visitors, adversely affect wildlife and cause damage to the landscape.

Animals

Riding horses or other animals in the Park is considered to be incompatible with Park values and usage and will generally not be permitted. Community events, which involve horse riding, may be approved by the relevant managing agency. In such cases horses are prohibited from areas of the Park zoned Conservation and Protection.

Boats and Canoes

Uncontrolled recreational use of watercraft such as rowing boats or canoes could have adverse impacts on the fauna and lakeside vegetation. There may be limited scope to include boats or canoes into ecotourism activities within the Park, their use will therefore need to be carefully considered. The use of recreational motorised watercraft is considered inappropriate within the Park.

Strategies

1. **Prepare and implement a recreation masterplan. The masterplan will:**
   - **coordinate access and circulation allowing visitors to move safely and conveniently throughout the Park. Park access should be integrated with surrounding community and regional path networks;**
   - **provide adequate parking facilities or on-road parking at major recreation nodes;**
   - **provide sensitively located and designed shoreline access to wetlands and lakes;**
   - **restrict private vehicles to designated car parks and access roads. (CALM, CJ,CW) [High]**
2. **Allow for emergency response within the Park and ensure new paths provide emergency vehicle access (Sections 28 and 30). (CALM, CJ,CW) [Medium]**
3. **Rehabilitate existing informal trails that are identified as unsuitable for access (Section 21). (CALM, CJ,CW) [Low]**
4. **Restrict horse riding in the Park to organised community events. Such community events require the approval of the relevant managing agency and are not to occur within areas of the Park zoned as Conservation and Protection (Section 20). (CALM,CJ,CW) [Ongoing]**
5. **Investigate the demand for, and impacts of, proposed watercraft use within the Park. (CALM, CJ,CW) [Low]**

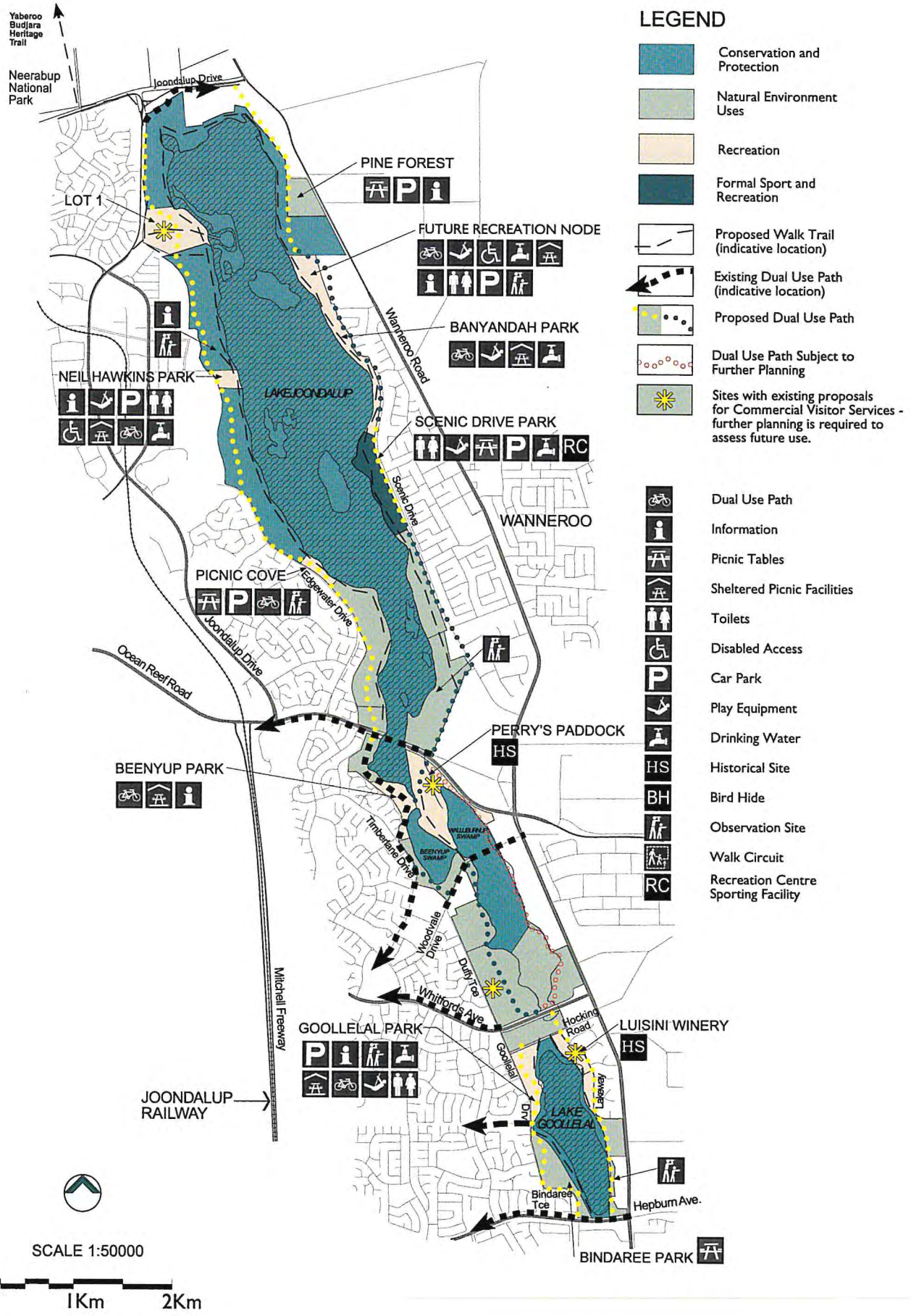
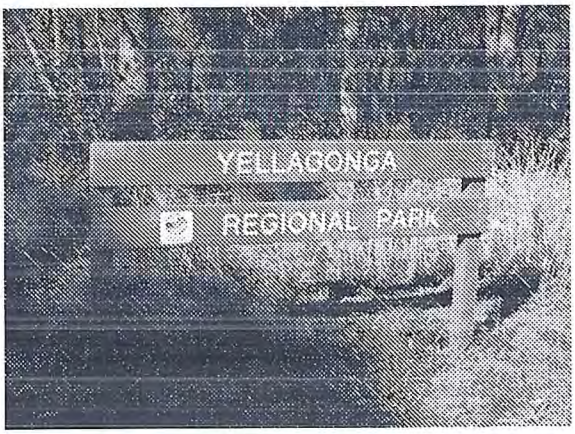


Figure 10 - Recreation Masterplan

29 - Signs

The objective is to provide a system of signs that clearly identify the location of the Park's features, leads to appropriate use of the recreation areas and helps communicate information about the values of the Park.



Signs play an important role, both notifying Park visitors about the way in which the Park can be accessed and used, as well as communicating information about the Park's identity and values. Signs need to be designed and located to provide messages about the Park in a uniform 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 local government and those managed by CALM. A consistent system of signs will be adopted which will provide flexibility for a range of situations and locations while also being clearly identifiable with the Park.

Recognition of the Park will also be enhanced by the use of a park logo on all signage installed by the management agencies.

Strategies

1. **Develop and implement a sign plan for the Park. The plan will incorporate guidelines for the use, placement and type of information, for direction and safety signs within the Park. Consider CALM's Regional Park Sign Manual as the basis for the plan. (CALM, CJ,CW) [High]**
2. **Develop a park logo. (CALM, CJ,CW) [High]**

30 - Visitor Safety

The objective is to take all reasonable and practical steps to enhance 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 dangers. Visitor safety will also be considered in design of access systems and recreation sites. 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 be an integral component in undertaking works programs and capital developments within the Park.

When managing risk, the Department of Conservation and Land Management is guided by Policy Statement No.53 Visitor Risk Management.

Strategies

1. **Undertake a safety audit and ensure that procedures are developed to manage and monitor all known risks. (CALM, CJ,CW) [High]**
2. **Provide information to visitors that highlights potentially hazardous areas, activities and appropriate preventative actions and emergency procedures. (Section 37). (CALM, CJ,CW) [Medium]**

E. LEASES AND COMMERCIAL OPERATIONS

31 - Principal Commercial Directions

COMMERCIAL GOAL

Allow for appropriate commercial and other uses within the Park that service visitor requirements, contribute to Park management and minimise impacts on Park values.

COMMERCIAL STRATEGY

Given its urban location and potential to accommodate commercial activities the Park will continue to be the subject of a variety of commercial proposals. The strategy for commercial development is to ensure the WAPC in association with CALM uses this plan as a mechanism for guiding development proposals within the Park or which impact upon the Park. Appropriate developments within the Park are to be compatible with the guiding principles discussed below. The Park's managing agencies will establish and manage any leases and licenses in accordance with CALM Policy Statement No 18, Recreation Tourism and Visitor Services. The tendering process for proponents involved with developments in regional parks will be consistent with the State government process.

COMMERCIAL GUIDING PRINCIPLES

1. Consistency of Commercial Use with Reserve Purpose
Commercial activities should be compatible with the assigned purpose of reserves within the Park. Reserves within the Park will be afforded an appropriate purpose for the protection and enhancement of Park values under the Land Administration Act 1997. Developments within the Park should service visitor demand. Facilities or services which exist or can be developed elsewhere, in a way which adequately meet the needs of visitors, would not normally be provided within Park.

2. Preservation of the Values of the Land Itself
Commercial use should not compromise the natural systems of the Park. Commercial activities should not be located in areas of the Park zoned for Conservation and Protection. Future developments should be of a character and arrangement that does not detract from the natural settings, landscape amenity and conservation values of the Park. Through the tendering process proponents of significant developments within the Park will be required to assess the environmental impacts of the proposed commercial use.

3. Equity
Commercial use within the Park should be of a nature that promotes multiple use by Park visitors. Commercial uses which impair other forms of acceptable use or jeopardise safety of other visitors should be specifically managed, directed to more appropriate places or not permitted. Priority will be given to commercial uses that incorporate features aimed at increasing the awareness, appreciation and understanding of the natural environment. All development applications will be assessed in terms of the overall commercial requirements for the Park.

4. Leased or Owned by the Managing Agencies
Commercial use of areas within the Park should be either through a lease or license arrangement, or where the managing agency owns and operates the facility or development.

5. Financially Viable
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 all commercial use within the Park will be used to help meet the overall cost of managing Yellagonga Regional Park.

6. Management
Activities and facilities must comply with the managing authorities requirements. If effective management of commercial facilities or activities cannot be provided they should be restricted to appropriate levels, relocated or removed from the Park.

32 - Commercial Operations and Leases

The objective is to ensure that commercial operations and leases are consistent with the values of the Park and enhance visitor satisfaction.

Commercial concessions may be granted on lands or waters managed by CALM to provide appropriate facilities and services for visitors. Proposals are assessed by CALM and require approval by the NPNCA and the Minister for the Environment. If the land in question is within a management area of the Water and Rivers Commission, the Commission must be consulted. If the land is subject to a Section 16 agreement under the CALM Act, the approval of the owner and consent of the occupier is required before a lease can be granted. Concessions must be consistent with the purpose of the area and the protection of its values.

Leases and licenses provide a mechanism to bring private capital and management expertise into visitor services in natural areas. They need to be carefully designed and managed, or they may 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.

CALM, the City of Joondalup and City of Wanneroo as managers of the Park should assess leasing and commercial operations according to the goals and objectives as set out in this Management Plan.

All development proposals on land reserved as Parks and Recreation in Perth's Metropolitan Region Scheme require approval from the Western Australian Planning Commission.

EXISTING COMMERCIAL VISITOR SERVICES

Existing commercial visitor services are limited to mobile kiosks and commercial tour buses that visit the Park. Strong community demand for additional commercial facilities indicates there is presently a lack of permanent commercial visitor services operating within the Park.

- **Wanneroo Recreation Centre**

The Wanneroo Recreation Centre incorporates sports fields and buildings on the eastern side of Lake Joondalup. The Recreation Centre caters for indoor sporting activities including basketball, badminton and roller skating. The centre also provides community meeting rooms which are widely used. The City of Wanneroo manages the Wanneroo Recreation Centre and surrounding buildings.

EXISTING PROPOSALS FOR COMMERCIAL VISITOR SERVICES

Sites within the Park that are subject to proposals include:

- **Lot 1**

Various proposals have been investigated for commercial enterprises within the area known as Lot 1 in the north-west of the Park. None of these proposals have, however, proceeded beyond the feasibility study stage.

Lot 1 offers considerable scope for the development of commercial visitor services. The site is readily accessible from Lakeside Drive, is close to relatively undisturbed conservation areas and provides extensive open spaces and views across Lake Joondalup. Due to the variety of landscape settings spread over a large area there is potential to integrate development within the existing landscape without compromising the visual and environmental qualities of the site.

A site development plan will be prepared for Lot 1 outlining proposed concepts for the site. Expressions of interest will then be sought to facilitate development of the site. Expressions of interest will require a comprehensive environmental impact study, feasibility study and business plan to ensure a proposals viability and suitability for location within the site.

- **Perry's Paddock**

The area known as Perry's Paddock has strong historical and cultural significance to both Aboriginal and non Aboriginal people. The area is important to the Nyungar people forming part of their Dreaming. To non Aboriginal people, the area was important in the development of Wanneroo with some of the first settlers of Perth taking up land and commencing farming, later turning to market gardening. A number of significant artefacts remain including a bunkhouse and cottage / stables, partly in ruins. A schoolhouse built in the Wanneroo Township in 1899 was relocated to the site in 1992 (Aris 1997). The original, natural landscape of the area has been significantly modified by past farming practices and an attractive, open, rural parkland landscape remains.

The heritage significance of Perry's Paddock is evidenced in the remaining buildings and rural landscape character. While it is not possible (or perhaps desirable) to return the site to a prior condition, use of the site should aim to maintain the relationship between settlement and landscape. Future use of the site should reinforce the heritage significance of existing structures with the open paddocks and expansive views across the site maintained. Future use of the site should be reviewed with regard to the policies of the Conservation Plan for Perry's Paddock (Aris 1997).

Significant development proposals for the site will require a comprehensive environmental impact study, feasibility study and business plan that addresses the commercial guiding principles to be submitted to the relevant planning and management agencies to ensure its viability and suitability for location within the Park.

- **Duffy Terrace**

A proposal for a botanic garden at Duffy Terrace in the south west portion of the Park outlines the creation of a highly modified landscape incorporating a variety of garden styles and spaces in contrast to the natural landscape character of the Park. The development would incorporate commercial facilities including a tourist centre.

The existing site has been significantly modified due to past land uses. Development could provide an overall improvement to the existing degraded areas. However, issues such as fertiliser infiltration and the effects of extraction of groundwater close by an existing wetland need detailed investigation.

A comprehensive environmental impact study, feasibility study and business plan that addresses the commercial guiding principles will be required to be submitted to the relevant planning and management agencies to ensure its viability and suitability for location within the Park.

- **Luisini Winery**

A heritage Conservation Plan prepared for the Luisini Winery by the City of Wanneroo and WAPC indicated the Winery's buildings and equipment have significant heritage value and are worthy of heritage listing. Following the City of Wanneroo's decision not to proceed with the Conservation Plan, it was agreed that the Winery be placed in the care, control and management of the National Trust of Australia.

The WAPC and the National Trust are currently discussing the future use and protection of the Winery, with the principles that future management of the site should seek to:

- protect the heritage values of the site;
- upgrade the building quality and services to allow for visitor use; and
- protect and enhance the surrounding landscape.

Consultation with the local community will be a key component in planning for the future use of the Winery. Additionally, a comprehensive environmental impact study, feasibility study and business plan that addresses the commercial guiding principles will be required to be submitted to the relevant planning and management

agencies to ensure the proposals viability and suitability for location within the Park.

OPPORTUNITIES FOR COMMERCIAL VISITOR SERVICES

There are opportunities for commercial activities that could provide Park visitors with the scope to learn about and explore the Park in new ways. These could include approved ecotourism activities. Commercial operations in the Park are not precluded and provide the opportunity to offer services to the public and the opportunity to raise revenue to assist in the management and provision of facilities in the Park.

Examples of commercial activities that may occur within the Park are as follows:

- **Restaurant, Café or Kiosk**

With the close proximity of the Park to the Joondalup City Centre and anticipated growth in the North West Corridor of Perth, it is likely pressure will increase in the future for additional facilities and services. It may be opportune to include the provision of a restaurant, café or kiosk as a service to visitors and also as a source of revenue for the Park. This matter will require further investigation by the managing agencies.

- **Bicycle Hire**

Cycling is consistent with the management objectives of the Park and should be encouraged. A cycle hire business would provide Park visitors with the ability to access many areas of the Park not accessible by vehicle. A licence to operate an ecotourism venture is issued by the relevant management authority. Licences to approved operators will be subject to licence conditions. Applications for commercial activities in the Park will only be considered after environmental and social impact assessments.

- **Ice cream vans or fast food outlets**

These businesses might operate in the Park subject to issuing an Itinerant Vendors Licence or Stall Holders Licence by the City of Joondalup and City of Wanneroo. They must comply with the relevant management agencies requirements, including not conflicting with other Park visitors. These businesses would not operate in areas zoned Conservation and Protection.

OTHER LEASES, DEVELOPMENT AND COMMERCIAL ACTIVITIES

Developments and concessions other than those for visitor services are generally not considered appropriate within regional parks, unless there is a considerable benefit to the Park. A number of primary production and residential leases exist within the Park, which are outside the scope of visitor services.

Existing leases within Yellagonga Regional Park will be honoured as per previous lease conditions. Upon expiration of a lease, an assessment by the relevant management authority will be made of its appropriateness within the Park (see commercial guiding principles).

- **Primary Production Leases**

One primary production lease exists within the Park. The lease extends over Lot 75 on Diagram 57092, Wanneroo Road, Wangara. The type of agreement is a rural lease agreement for market gardening. Primary production leases are considered inappropriate within Yellagonga Regional Park.

- **Residential Leases**

Three residential leases exist within the Park. These are located at Pt Lot 50 on P8364, Pt Lot 51 on P8364 and Lot 1 on Diagram 44111, Hocking Road, Kingsley. Residential leases are considered inappropriate within the Park. It is envisaged all residential properties will be professionally assessed and recommendations presented for their future use.

- **One-off Community Events**

One-off community events will be assessed by the relevant management agency. Depending on the type of activity a concession arrangement may be required between the event organiser and the managing agency. Management agencies should use the guiding principles established for commercial uses as a means determining the appropriateness of proposed activities. As the agency coordinating the management of regional parks, CALM should be consulted in the assessment of one-off community events.

- **Mining**

Freehold Property

Existing protection for freehold property within Yellagonga Regional Park relies on the provisions of the Environmental Protection Act, in particular the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992.

Applications for mining within the Park will be dealt with in accordance with:

1. the memorandum of understanding between the Environmental Protection Authority (EPA) and the Department of Minerals and Energy (DME) (refer to DME Information Series 11) ; and
2. the Regional Park Mining Protocol currently being developed by CALM and DME for land falling outside the EPA - DME memorandum of understanding.

The Regional Park Mining Protocol will apply to all freehold property within regional parks.

Long-term protection from mining on freehold property will be enhanced with the Park being classified as class 'A' reserve under the Land Administration Act 1997.

Crown Reserves

Mineral exploration in 'A' Class nature reserves, national parks and conservation parks (South West) is subject to the concurrence of the Minister for the Environment and the Minister for Mines. Proposals causing significant environmental disturbance may be referred to the EPA by the NPNCA if required. Mining will require the consent of both Houses of Parliament and EPA assessment.

Exploration and mining in Lands other than 'A' Class (formerly 'B' and 'C' Class) reserves, and CALM Act reserves is subject to referral to the EPA,

recommendations of the Minister for the Environment, and approval by the Minister for Mines.

- **Extraction of Basic Raw Materials**

Extraction of basic raw materials (BRM) such as sand and gravel is variously regulated under the Mining Act, Land Acquisition and Public Works Act and the Local Government Act.

Proposals to access BRM for 'Public Works' on CALM estate are considered in accordance with NPNCA Policy Statement No. A5 'Basic Raw Materials'. On freehold land BRMs are not defined as "minerals" under the Mining Act and commercial extraction is subject to Extractive Industry Licenses under the Local Government Act. Proposals for mining under Extractive Industry Licenses will not be supported within regional parks. Applications for Mining Act tenements targeting BRM within regional parks will be processed in accordance with agreed procedures under the memorandum of understanding between DME and EPA. There will be a general presumption against BRM extraction in Yellagonga Regional Park.

Strategies

1. **Establish and manage commercial operations in accordance with CALM Policy Statement No. 18, Recreation, Tourism and Visitor Services. Concessions in the Park may be provided if they are consistent with the purpose of the Park, and approved by NPNCA and the Minister for the Environment. Proceeds from commercial operations are to be used for park management or infrastructure. (CALM, CJ,CW) [Ongoing]**
2. **Ensure commercial activities are consistent with the commercial guiding principles. Conditions are to fulfilled by concession holders and an appropriate fee is paid that contributes an income to park management. (CALM, CJ,CW) [Ongoing]**
3. **Proponents of major commercial activities must complete an appropriate expression of interest. (CALM, CJ,CW) [Ongoing]**
4. **Prepare a site development plan for Lot 1 outlining proposed concepts for the site. (CALM, CJ) [High]**
5. **Assess all residential properties regarding their future use. (CALM) [High]**
6. **Develop management guidelines for advertising within the Park. (CALM, CJ,CW) [Medium]**
7. **Assess one-off community events in relation to the guiding principles for commercial use of the Park. (CALM, CJ,CW) [Ongoing]**
8. **Finalise the Regional Park Mining Protocol. (CALM, DME) [High]**
9. **Assess all requests to access basic raw materials within the Park in accordance with CALM and NPNCA policies. [Ongoing]**

33 - Services and Utilities

The objective is to provide cost efficient and safe services and utilities within the Park and to negotiate with authorities placing utilities in the Park so that environmental impacts are avoided or negligible.

Future commercial, administrative or educational facilities will require services to be brought into the Park at various places. Services, such as electricity, water, sewer, gas and telephone are available at the boundaries of the Park. Underground sewerage lines cross the Park at various locations. Other services are also associated with roads that traverse the Park.

It is important that the managers of the Park liaise with service providers so that future development services are located outside the Park boundary. Additionally, the number of service corridors in the Park should be rationalised by combining utility requirements. Where possible, Park developments such as dual use paths, service roads and firebreaks should be developed along these corridors.

SEWERAGE FACILITIES

It is proposed a trunk sewer will be constructed along the eastern boundary of the Park from Ocean Reef Road in the north to Lake Goollelal in the south. An easement would be formed for maintenance. The need for regular access to points along the route would require that a vehicular track is located where the route is positioned some distance from existing major roads. As areas of the eastern side of the Park lack pathway access, there is an opportunity to combine recreational dual use paths with access ways to trunk sewer maintenance points.

There will also be an opportunity to implement rehabilitation programmes as part of the Water Corporation's obligation to restore the sewer easement. Further investigation of these opportunities will occur in consultation with the Water Corporation.

STORMWATER OUTLETS AND DRAINAGE FACILITIES

The City of Joondalup and City of Wanneroo manage the local drainage system leading into the Park. Local drains divert stormwater and surface water runoff from the surrounding catchment area into the wetland

system. Nutrient enrichment and altered water regimes threaten the natural values of the wetlands.

There are many stormwater outlets and drainage facilities within the Park. The two main issues associated with drainage facilities are:

- Ecological impacts (Section 14 Water quality, Section 15 Vegetation and Section 17 Weeds).
- Aesthetic and visual impacts (Section 23 Landscape Amenity).

The ecological impacts associated with stormwater drainage can be reduced and requires cooperation and consultation between the managing agencies. The management of stormwater entering the Park's wetlands is a catchment wide issue, and controls need to be implemented at that level. The Cities of Joondalup and Wanneroo have endorsed initiatives of integrated catchment management. Such initiates are supported by CALM. All new development adjoining the Park will be required to dispose of stormwater appropriately within the development site. No additional outfalls or connection of any newly constructed drain networks to existing outfalls is permitted. In the longer term, existing stormwater outfalls will be reviewed to assess the viability of improving water quality entering the Park without constructing additional recharge devices within the Park's boundary.

Many outlets are unattractive and more attention to detail is necessary so that they blend with their natural surroundings. Consideration should be given to their appearance and function by battering back walls and planting the sides with local vegetation. This would have the effect of improving existing outlets and stripping nutrient from storm water before it reaches the Yellagonga wetlands. Together with modifications to their alignment these treatments should lead to utilities that remain functional and yet merge into their surroundings.

ROADS

Roads will only be constructed in the Park if they are for management purposes or are servicing a recreation facility. Where possible, facilities should be located near the boundaries to reduce the need to place roads within the Park. Where new urban development occurs adjacent to the Park, the construction of a roadway or pathway between the development and the Park will provide a well-defined barrier clearly separating differing land uses.

Some service facilities located on the eastern side of Lake Joondalup are accessed via tracks which lead off sealed roads. These tracks allow uncontrolled vehicular access to areas of the lake edge where rubbish dumping occurs and disturbance of vegetation or the ground is evident.

PARKLAND SERVICING AND MAINTENANCE

Parkland and recreational areas will need regular maintenance that will predominantly be the responsibility of the City of Joondalup and City of Wanneroo. The collection of rubbish, maintenance and provision of toilet facilities and general maintenance operations within the Park will require regular access.

The provision of bins will be minimised and visitors encouraged to take their rubbish home.

An existing toilet facility at Neil Hawkins Park may need to be upgraded or refurbished during the course of the plan. Any additional toilet requirements will need to be justified and meet approved design criteria. In particular siting and design should minimise the environmental and visual impacts to the area and adjoining properties.

Existing or proposed toilets within the Park are to be connected to sewer outlets or other environmentally acceptable disposal systems. The use of septic tanks is to be avoided except in conjunction with alternative treatment units.

POWER LINES

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

Strategies

1. **Where appropriate, ensure a detailed rehabilitation program accompanies service works which may impact on Park values (Section 21). (CALM, CJ,CW) [Ongoing]**
2. **Prevent additional direct drainage outlets from being constructed in the Park. (CALM, CJ,CW) [Ongoing]**
3. **Review existing drainage facilities to improve water quality entering the Park and to improve the aesthetics of the outlets (Section 14). (CALM, CJ,CW) [Low]**
4. **Liaise with the Ministry for Planning so that future development proposals adjoining the Park incorporate appropriate interface treatments (eg a road or dual use path edge) with the Park. (MFP, CALM, CJ,CW) [Ongoing]**
5. **Construct roads within the Park for approved recreation or management purposes only (Section 26). (CALM, CJ,CW) [Ongoing]**
6. **Promote "take it home" rubbish education. (CJ,CW, CALM) [Medium]**
7. **Ensure existing or proposed toilets within the Park are connected to sewer outlets or other environmentally acceptable disposal units. (CALM, CJ,CW) [Ongoing]**
8. **Place power lines to facilities and amenity lighting underground, to improve aesthetics of the Park. (CALM, CJ,CW) [Low]**

F. RESEARCH AND MONITORING

34 - Principal Research and Monitoring Directions

RESEARCH AND MONITORING GOAL

Seek a better understanding of the natural, cultural and social environments, and the impacts of visitor use and Park management.

RESEARCH AND MONITORING STRATEGY

The strategy for research and monitoring is to implement a co-ordinated and effective means of survey, research and monitoring, within the Park. This is to be based on monitoring the key performance indicators outlined in Section 11.

35 - Research and Monitoring

The objective is to further develop and maintain knowledge in regard to visitor use, natural processes and the influence of people on the Park.

RESEARCH

Effective management of Yellagonga Regional Park requires more accurate information about the many issues and pressures effecting the Park and its values. There have been a number of studies on the wetland system, particularly for Lake Joondalup, which indicate the wetlands are under threat from pollution and increasing nutrients, and further information is required. Such information is vital for sound decision making and is required as a matter of urgency. Details of these studies are contained in the References and Bibliography (page 47).

It is desirable that research projects involve as wide a range of people as possible. The involvement of volunteers, educational institutions and individual researchers can reduce research and monitoring costs and assist in providing information to management bodies and the broader community (see Section 39).

Community groups and schools can also play an important role in scientific research and monitoring. The Friends of Yellagonga Regional Park (Inc) have in the past undertaken a groundwater monitoring project demonstrating the valuable role community groups can play in Park research and monitoring.

Additionally, the Park is situated in close proximity to the Joondalup campus of Edith Cowan University and the West Coast College of TAFE – Joondalup Campus. CALM's Woodvale Wildlife Research Centre is located to the west of the Park and includes a library and excellent resources for people involved in, and interested in, management of natural areas.

MONITORING

The priorities for monitoring in the Park have been defined by the key performance indicators (Section 11). Key performance indicators for Yellagonga Regional Park are:

- Wetland health
- Bushland condition
- Fauna populations and species diversity
- Visitor satisfaction
- Visitor risk

Individual sections of this Plan provide strategies concerning research and monitoring that is required.

All research and monitoring undertaken in the Park is to be co-ordinated by CALM. A process for authorising access to the Park is to be established by the managing agencies in an effort to ensure an integrated approach to research and monitoring.

Strategies

1. **Develop an integrated program of survey, research and monitoring based on the Key Performance Indicators (Section 11). (CALM, CJ,CW) [High]**
2. **Support and where possible seek grant applications to encourage scientific research and monitoring within the Park. (CALM, CJ,CW) [Ongoing]**

G. COMMUNITY RELATIONS

36 - Principal Community Relations Directions

COMMUNITY RELATIONS GOAL

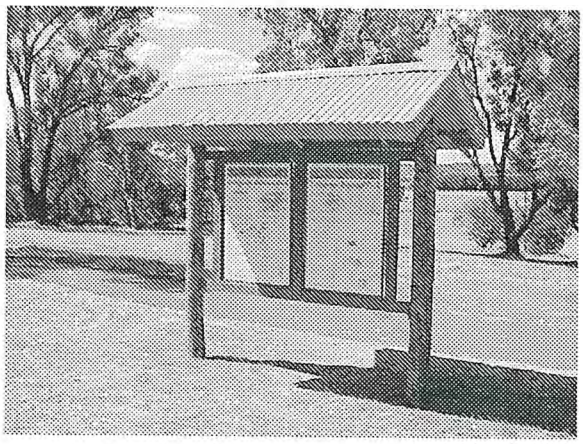
Promote informed appreciation of the Park's natural environment, cultural values and recreation opportunities and facilitate liaison with the community about their management

COMMUNITY RELATIONS STRATEGY

The strategy for community relations is to provide interpretation, information and education about the Park and management practices and involve a wide range of public participation in implementing the Management Plan.

37 - Information, Interpretation and Education

The objectives are to increase the community's awareness, appreciation and understanding of the Park's values and to gain support for management practices.



An effective communication program is essential to achieve the goals and objectives of the management of the Park. It informs the public of attractions, facilities and opportunities available and provides an avenue for an appreciation and a greater understanding of the natural environment. Additionally, it fosters appropriate behaviour so that adverse impacts on the environment are minimised.

The Yellagonga Regional Park communication program will have three parts:

- Information – providing an overview of opportunities and details of facilities, activities and regulations;
- Interpretation – explaining natural and cultural features; and
- Education – providing detailed materials and programs designed to facilitate learning, focussing on target groups (e.g. school groups, community groups).

An integrated information, interpretation and education program will be developed for Yellagonga Regional Park. Mechanisms for facilitating the program include signs, displays, publications (such as brochures) and activities.

Involvement of the community in the 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.

Materials for interpretation and education have been developed for the Park. These include material on the social and natural history of the Park. Visitors to Yellagonga Regional Park will require information to help plan their visit, enjoy and appreciate the Park and to help 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 within the Park include:

- the Lake and its wetland areas;
- recreational opportunities;
- flora and fauna;
- cultural influences (both Aboriginal and non Aboriginal people);
- the Regional Park entity, its management and evolution; and
- responsible use of the Park.

The development of interpretive material should be undertaken in a co-ordinated 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 management, 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.

The Friends of Yellagonga (Inc) provide opportunities for people to be involved in community programs and other Park activities (see Section 39).

VISITOR (EDUCATION) CENTRE

The development of a Visitor (Education) Centre can serve as a focus for educational and research programmes related to the Park. Such a centre would offer accessible, timely information about the values of the Park together with activities and programmes to interpret those values. The viability of a visitor centre may be strengthened by an association with other

community facilities or combined with a commercial activity.

There are a number of locations for such a facility in the Park. These include, Lot 1 – in the north west of the Park; Lot 3 - just north of Ocean Reef Road and the Luisini Winery site. Given the size and diversity of the Park it may be possible to present different aspects about the Park in more than one location.

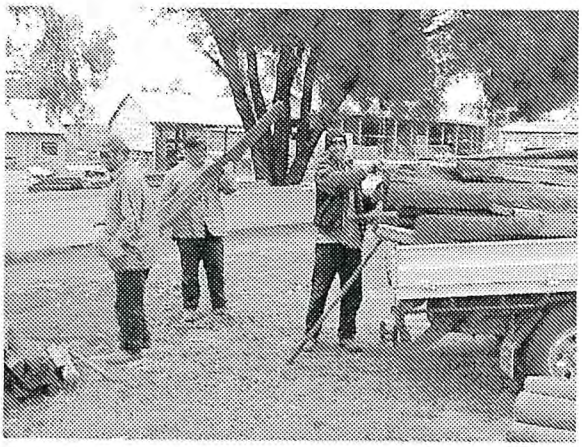
Strategies

1. **Develop and implement a communication plan for interpreting Park values and understanding and supporting management programs. Consider the CALM Communication Plan as the basis for the Park's communication plan. (CALM) [Medium]**
2. **Investigate providing Park information and interpretive material in a multi-purpose environmental education facility. (CALM, CJ,CW) [High]**

H. PLAN IMPLEMENTATION.

38 - Priorities, Funding and Staff

The objective is to manage the Park using the priorities developed for implementation.



IMPLEMENTATION PLANS AND PROGRAMS

Given the strategic nature of this Plan, detailed implementation plans will be required prior to operations taking place within the Park. A five-year implementation program and annual works program will be prepared to guide the implementation of this Plan. Implementation programs will be based on the priorities outlined in this Plan which have been established by the joint managers of the Park.

Local governments and other agencies involved in the management of the Park will be consulted by CALM in the preparation of the Park's annual works program and five year implementation program.

STAFFING

The City of Joondalup and City of Wanneroo currently manage their respective reserves within the Park using staff from their Operations Units and contracts as required. CALM services its management obligations with staff from the Regional Parks Unit and contractors.

FUNDING

CALM, the City of Joondalup and City of Wanneroo will finance and manage their respective land areas (see Figure 4). As CALM and the local governments concerned have limited funds and resources, it will be necessary to seek additional funding arrangements for the Park.

Responsibility for acquisition of private lots proposed for inclusion in the Park rests with the Western Australian Planning Commission.

Strategies

1. **Prepare and implement a five year implementation program and annual works program, taking into account the priorities identified in this plan. Consult with the appropriate management agencies involved in the Park when preparing these programs. (CALM, CJ,CW) [High]**
2. **Seek corporate sponsorship and other funding arrangements for the Park. (CALM, CJ,CW) [Ongoing]**

39 - Community Involvement

The objective is to actively encourage as much community involvement as possible, in implementing the Management Plan.

The community was made aware of the preparation of this Management Plan through newspaper advertising, articles and CALM publications.

The public was formally involved in the preparation of this Plan through the Yellagonga Regional Park Community Advisory Committee. The Committee provided advice and commented on the Plan throughout the preliminary stages of the Plan's preparation. The Yellagonga Regional Park Community Advisory Committee was formed in November 1997 and consists of community members and representatives of the management agencies.

The existing Community Advisory Committee's role, composition and structure will be reviewed periodically.

It is very important that the broader community is actively involved in assisting with the implementation of this Management Plan. This involvement can provide a sense of community ownership of the Park and encourages interested people to be involved with the Park's future planning and management. With limited resources available to undertake works in the Park, volunteer labour needs to be used wherever possible.

Residents in neighbouring suburbs have shown considerable interest in the management of the Park. This was particularly noticeable at the community workshop held as part of this management planning process.

Local residents have the enormous benefit of living in an urban situation immediately adjacent to an extensive natural area. It is important to seek the cooperation and involvement of adjacent landowners to protect the values of the Park. This can be done through educational programs which promote responsible use of the Park and inform the community of management roles and responsibilities. Programs should outline the effects of inappropriate activities such as dumping rubbish and garden waste in the Park, and disposing fish and pool water into local drains which flow into the Park's wetlands and lakes.

Edith Cowan University – Joondalup Campus, the West Coast College of TAFE – Joondalup Campus and a number of secondary and primary schools provide a strong educational presence in close proximity to the Park. All educational institutions should be encouraged to use the Park for educational and research purposes.

There are a number of different ways members of the community can be involved in assisting with the implementation of this Plan. These include:

- joining volunteer organisations such as the Friends of Yellagonga Inc;
- establishing a catchment management group;
- joining CALM's Bush Rangers Program;
- contacting members of the Yellagonga Regional Park Community Advisory Committee; and
- using the community service program to assist Park management.

It is important that all works carried out are carefully planned and co-ordinated by the managing agencies. Activities need to be consistent with the planning and operations of the managing agencies. CALM has developed a process for coordinating volunteer programs within regional parks. This process should be implemented by all the managing agencies involved with Yellagonga Regional Park. Volunteer groups should develop their projects in consultation with the managing agencies to be consistent with the Parks annual works program and five year implementation program.

Strategies:

1. **Encourage and support the activities of community groups within Yellagonga Regional Park. (CALM, CJ,CW) [Ongoing]**
2. **Promote responsible use of the Park and keep the community and other organisations informed of management actions, programs and developments within the Park (Section 37). (CALM, CJ,CW) [Ongoing]**
3. **Co-ordinate all activities of volunteers in the Park. (CALM, CJ,CW) [Ongoing]**
4. **Through the development of a Communication Plan, keep the public informed of management actions, activities and developments in the Park. (CALM, CJ,CW) [Ongoing]**
5. **Encourage use of the Park by educational institutions. (CJ,CW, CALM) [Ongoing]**

40 - Term of the Plan

This Plan will help progress the Park towards its long term vision (Section 5). In doing so it will be subject to a series on conditions and reviews to ensure its appropriateness and effectiveness.

The term of this plan will be 10 years. If the Plan does not require revision after 10 years, it will continue to provide management direction. Section 61 of the CALM Act provides for the Plan to be amended as required. If major changes to the Plan are proposed, the revised Plan will be released for public comment.

PERFORMANCE ASSESSMENT

The NPNCA has overall responsibility for monitoring the implementation of the Plan. The effectiveness of the Plan will be reviewed through a formal auditing and review process.

The Plan be subject to:

- a mid-term (5 year) and end-of-term audit (ten year) audit; and
- an annual review.

The difference between the two processes is described below:

Mid-term and end-of-term audit

The Plan will be audited mid-term and towards the end of its 10 year term by the NPNCA. This will include a re-assessment of the overall direction of the Plan (including the need for a replacement management plan) in light of what has been achieved, changes in surrounding land uses, community aspirations, funding and relative priorities.

Overall management performance will be audited assessing the key performance indicators (Section 11).

Annual review

The purpose of the annual review is to assess the implementation progress of the Plan prior to preparing the operations program for the following year. The annual review will be undertaken by Park management and should identify which strategies have been achieved since the last review and facilitate target setting for the next year. Major milestones and achievements should be noted for updating the Plan and informing the NPNCA.

Strategies

1. **Review the implementation of the Management Plan annually to identify strategies that have been achieved and to what degree any new information may affect management. (CALM, CJ,CW) [Ongoing]**
2. **Audit the Management Plan mid-term and towards the end of its 10 year term. (CALM, NPNCA) [Ongoing]**

References and Bibliography

Ahern J., (1995), Greenways as a Planning Strategy. J. Landscape Urban Planning. 33: 131 – 156.

Aris K., (1997), Conservation Plan: Perry's Paddock, City of Wanneroo, Western Australia.

Arnold J., (1990), Perth Wetlands Resource Book: Chapter 7 - Wanneroo Linear Lakes, Bulletin 266, Environmental Protection Authority and the Water Authority of Western Australia, Perth, Western Australia.

Aulakh G.S. (1988), Land Use Options: Lake Joondalup, Thesis (M.Sc), School of Agriculture, University of Western Australia, Perth, Western Australia.

Balla S., (1994), Wetlands of the Swan Coastal Plain: Volume 1 - Their Nature and Management, Water Authority of Western Australia and Department of Environmental Protection. Perth, Western Australia.

Bamford M.J. and A.R. (1990), Yellagonga Regional Park: A Preliminary Survey of Vertebrate Fauna, Department of Conservation and Land Management, Perth, Western Australia.

Bekle H., (1980), A Seasonal Biogeography of Lake Joondalup, (ed.), *Geowest 16: Some Aspects of Bioclimatology and Biogeography,* University of Western Australia, Nedlands, Western Australia.

Bekle H., (1988), Waterbird Usage of Lakes in the Perth Region, Western Australia: A Study of Patterns in Time and Space, PhD Thesis, Department of Geography, University of Western Australia, Perth, Western Australia.

Blair A., (1978), Mosquito Investigation No. 2 - Shire of Wanneroo, Bulletin No. 36, Department of Conservation and Environment, Perth, Western Australia.

Bott G., (1993), Relationships Between the Extent of Conventional, Broadscale Agriculture and Stream Phosphorus Concentration and Phosphorus Export in South-West Western Australia, Discussion Paper No. 2. Office of Catchment Management, Perth, Western Australia.

Bourke, MJ, (1987), On the Swan: a history of the Swan District, Western Australia. University of Western Australia Press, Perth.

Brittain R.K., (1987), Perry's Paddock: Historical Village, City of Wanneroo, Kidd and Povey Pty Ltd, Yokine, Western Australia.

Candy R., and Greay B., (1989), Wetlands - A Management Perspective : *Wetlands in Crisis: What Can Local Governments Do? - Conference Papers 15 June 1988,* Bulletin 372, Environmental Protection Authority, Perth, Western Australia.

City of Canning, (1995), Canning River Regional Park: Draft Management Plan 1995-2005, Department of Conservation and Land Management, National Parks and Nature Conservation Authority and City of Canning, Perth, Western Australia.

City of Canning, (1997a), Canning River Regional Park: Analysis of Public Submissions, Management Plan No 36, Department of Conservation and Land Management, National Parks and Nature Conservation Authority and City of Canning, Perth, Western Australia.

City of Canning, (1997b), Canning River Regional Park: Management Plan 1997-2007, Management Plan No 36, Department of Conservation and Land Management, National Parks and Nature Conservation Authority and City of Canning, Perth, Western Australia.

Congdon R.A., (1979). Hydrology, Nutrient Loading and Phytoplankton In Lake Joondalup: A Feasibility Study, Bulletin No. 67, Department of Conservation and Environment, Perth, Western Australia.

Congdon R.A., (1985), The Water Balance of Lake Joondalup, Bulletin No. 183, Department of Conservation and Environment, Perth, Western Australia.

Congdon R.A. and McComb A.J., (1975), The Nutrients and Plants of Lake Joondalup, A Mildly Eutrophic Lake Experiencing Large Seasonal Changes in Volume, : *Journal of the Royal Society of Western Australia,* Volume 59, Part 1, pp. 14-23.

Davis J.A., Harrington SA, Pinder A, (1989), Chironomids (Midges) Survey of Lake Goollelal, Murdoch University, Perth.

Daniel G & Cockman M, (1979), The Story of Wanneroo, Shire of Wanneroo.

Davis J.A., Pinder A, Trayler K.M. and Harrington SA, (1990), Towards More Effective Control of Nuisance Chironomids (Midges) in Metropolitan Wetlands, Murdoch University, Perth, Western Australia.

Davis J.A. and Rolls S.W., (1987), A Baseline Biological Monitoring Programme for The Urban Wetlands of the Swan Coastal Plain, Western Australia, Seasonal Variation In The Macroinvertebrate Fauna and Water Chemistry of Five Perth Lakes, Bulletin 265, School of Environmental and Life Sciences, Murdoch University, Perth, Western Australia.

Department of Conservation and Environment, (1986), Draft Guidelines for Wetland Conservation in the Perth Metropolitan Area, Bulletin 227. Department of Conservation and Environment, Perth, Western Australia.

Department of Conservation and Land Management, (1996), Guidelines for a Bushland/Wetland Management Plan, Perth, Western Australia.

Department of Conservation and Land Management, (1989), Visual Landscape Management System, Perth, Western Australia.

Department of Conservation and Land Management, (1994). Reading the Remote Landscape Character Types of Western Australia, Perth, Western Australia.

Department of Environmental Protection, (1998), Ecoplan, : World Wide Web Url:http://www.environ.wa.gov.au/support/ecp/Default-ecoplan.htmi Addressed 2 March 1998, (DEP).

Department of Planning and Urban Development, (1992), North - West Corridor; Structure Plan, Department of Planning and Urban Development, (DPUD), Perth, Western Australia.

Department of Planning and Urban Development, (1991b), Yellagonga Regional Park Supplementary Report, Department of Planning and Urban Development, (DPUD), Perth, Western Australia.

Department of Planning and Urban Development, (1992a), Yellagonga Regional Park - Final, Department of Planning and Urban Development, (DPUD), Perth, Western Australia.

Department of Planning and Urban Development, (1994), Planning and Management for Water Sensitive Urban (Residential Design - Consultants Report, Department of Planning and Urban Development, Water Authority of Western Australia, and The Environmental Protection Authority, Perth, Western Australia.

Department of Transport, (1996), The Perth Bicycle Network Plan, Bikewest.

Ecologia Environmental Consultants, (1998), Lake Goollelal Management Plan, City of Wanneroo, Western Australia.

Environmental Protection Authority, (1990), A Guide to Wetland Management in Perth, Bulletin 374, Environmental Protection Authority, (EPA), Perth, Western Australia.

Environmental Protection Authority, (1993a), A Guide to Wetland Management in Perth and Near Perth Swan Coastal Plain Area. Bulletin 686, Environmental Protection Authority, (EPA), Perth, Western Australia.

Environmental Protection Authority. (1993b), Red Book: Status Report, Report 15, Environmental Protection Authority, Perth, Western Australia.

Environmental Protection Authority, (1995), Protecting Perth's Coastal Waters and Beaches - A Plan for Doing it Better, Bulletin 51-1, Environmental Protection Authority, (EPA), Perth, Western Australia.

Evangelisti and Associates, and Landvision, (1994), Stormwater Management Strategy and Plans for Byford and Mundijong: Incorporating Water Sensitive Design Principles, Water Authority of Western Australia and the Department of Planning and Urban Development, Perth, Western Australia.

Godfrey N., Jennings P. and Nichols O., (ads), (1992), A Guide to Wetland Management on the Swan Coastal Plain, Wetland Conservation Society, Perth, Western Australia.

Halse S.H., (1990), The Relationship Between Catchment Management and Wetlands, Avifaunal Utilisation of Wetlands and Agricultural Wetland Management, : *Wetlands of the South West of Western Australia,* South West Development Authority, Perth, Western Australia.

Humphries B., and Davis J., (1989). Problems: Causes, Consequences and Correctives, : *Wetlands in Crisis: What Can Local Governments Do? - Conference Papers 15 June 1988,* Bulletin 372, Environmental Protection Authority, Perth, Western Australia.

James B., (1989), Lake Joondalup, Regional Open Space: North-West Portion - Landscape Masterplan, Department of Planning and Urban Development, Perth, Western Australia.

Kinnear A., Garnett P., Bekle H., and Upton K., (1997), Yellagonga Wetlands: A Study of the Water Chemistry and Aquatic Fauna, Research Report No. 1, Centre for Ecosystem Management, Edith Cowan University, Joondalup, Western Australia.

LeProvost, Semeniuk and Chalmer, (1985), Roadworks and Wetlands in the Perth Metropolitan Region: Recommendations for Conflict Resolution, Bulletin 233, Department of Conservation and Environment, Perth, Western Australia.

McArthur, W.M. and Bartle, G.A., (1980), Landforms and Soils as an Aid to Urban Planning in the Perth Metropolitan North West Corridor, Western Australia. (CSIRO)

Middle G., (1990), Wetland Management - Evaluating Wetlands, Experience with EPA Bulletin 374 and the Role of the Water Authority, : *Wetlands of the South-West - the Role of Local Governments and Landowners in the Management of Wetlands in the South West of Western Australia,* South West Development Authority, Perth, Western Australia.

Ministry for Planning (1998), Perth's Bushplan (Draft), Ministry for Planning, (MFP), Perth, Western Australia.

Museum Studies Consulting in association with Sarah Murphy Consulting and Desmond Freeman Associates, (1999), Heritage and Museum Services and Facilities Planning Study, Report prepared for the City of Joondalup and Shire of Wanneroo, Perth, WA

Ove Arup and Partners, (1994), Yellagonga Regional Park – Drainage Study, City of Wanneroo.

Pinder A,. Trayler K.M, Davis J.A, (1991), Chironomid Control In Perth Wetlands: Final Report and Recommendations. Murdoch University, Perth, Western Australia.

Prince C., Cooper D., Lewington J.,and Lamond T., (1996), Aboriginal Heritage: Report of an Aboriginal Heritage Survey, Perry's Paddock, Joondalup, McDonald, Hales and Associates Pty Ltd, Western Australia.

QDR Consulting, (1997), Concept Proposal: An Enviro-Village in the Heart of Joondalup, QDR Consulting, Joondalup, Western Australia.

RAOU, (1996D), Database of Western Australian Birds Project (RAOU Tracking Database).

Seddon G., (1972), A Sense of Place, University of Western Australia Press, Nedlands, Western Australia.

Semeniuk V&C Research Group, (1997), Assessment of Walluburnup Swamp and Nearby Wetlands, City of Wanneroo.

Singleton J., (1989), The History and Tenure of Wetlands, : *Wetlands in Crisis: What Can Local Governments Do? - Conference Papers 15 June 1988,* Bulletin 372, Environmental Protection Authority, Perth, Western Australia.

Sage L., (1997), Weed Survey of Yellagonga and Beeliar (Mt Brown, Mt Brown swamp and Thomsons Lake) Regional Parks, Department of Conservation and Land Management.

State of Western Australia, (1997), Parks for People: Western Australia, Western Australian Planning Commission, Perth, Western Australia.

The Water Sensitive Urban Design Research Group, (1989), Water Sensitive Residential Design: An Investigation into its Purpose and Potential in the Perth Metropolitan Region, Western Australian Water Resources Council (WSUDRG), Perth, Western Australia.

Water Authority of Western Australia (1995) Review of Proposed Changes to Environmental Conditions, Gnangara Mound Groundwater Resources (Section 46), Water Authority of Western Australia.

Tingay and Associates, (1980), A Strategic Plan for Perth's Greenways, Final Report, Perth, Western Australia.

Yellagonga Environment Centre, Learning to Care for our Future: A centre for research, education and development of sustainable technology, Pamphlet, Joondalup Development Corporation, Western Australia.

Yellagonga Environment Centre, (1992), Yellagonga Environment Centre Position Paper, Joondalup Development Corporation, Joondalup, Western Australia.

Yellagonga Environment Centre Inc., A Local Project and a Resource for the Community, Information Sheet, Joondalup Development Corporation, Joondalup, Western Australia.

Abbreviations

A list of abbreviations used in this plan:

AHD	Australian Height Datum
ANCA	Australian Nature Conservation Agency
APB	Agriculture Protection Board
BRM	Basic Raw Materials
CALM	Department of Conservation and Land Management
CAMBA	China Australia Migratory Bird Agreement
CBD	Central Business District
CJ	City of Joondalup
CW	City of Wanneroo
DEP	Department of Environmental Protection
DME	Department of Minerals and Energy
DOLA	Department of Land Administration
DOT	Department of Transport
DPUD	Department of Planning and Urban Development (now MFP)
DUP	Dual Use Path
EPA	Environmental Protection Authority
ICMG	The City of Joondalup / City of Wanneroo Integrated Catchment Management Group
ICOMOS	The International Charter for the Conservation of Monuments and Sites. The Burra Charter was adopted by the Australian ICOMOS in 1981.
HDWA	Health Department of Western Australia
JAMBA	Japan Australia Migratory Bird Agreement
LAA	Land Administration Act 1997
MLA	Member of the Legislative Assembly
MFP	Ministry for Planning
MRWA	Main Roads Western Australia
MRS	Metropolitan Region Scheme
NPNCA	National Parks and Nature Conservation Authority
NTAA	Native Title Amendment Act 1998
RAOU	Royal Australasian Ornithologists Union
RAMSAR	Convention on the Conservation of Wetlands of International Importance: Especially Waterfowl Habitat. Known as the RAMSAR Convention
SPC	State Planning Commission (now WAPC)
FESA	Fire and Emergency Services of Western Australia
WAPC	Western Australian Planning Commission
WC	Water Corporation of Western Australia
WP	Western Power

Appendix 1: Contacts

Department of Conservation and Land Management
Regional Parks Unit
PO Box 1535
Fremantle WA 6959
9431 6500

Department of Conservation and Land Management
State Headquarters
Locked Bag 104
Bentley Delivery Centre WA 6983
9334 0333

Department of Conservation and Land Management
Perth District
5 Dundebar Road
Wanneroo WA 6065
9405 1222

City of Joondalup
PO Box 21
Joondalup WA 6919
9400 4000

City of Wanneroo
Locked Bag 1
Wanneroo WA 6946
9405 5000