Stirling Range and Porongurup National Parks

Management Plan 1999–2009

MANAGEMENT PLAN NO 42

Department of Conservation and Land Management

National Parks and Nature Conservation Authority

MANAGEMENT PLAN

Stirling Range National Park

and

Porongurup National Park

1999-2009

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for the

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PREFACE

Under the *Conservation and Land Management Act 1984*, conservation reserves in Western Australia are specified as national parks, conservation parks, nature reserves, marine management areas, marine parks and marine nature reserves. National parks, conservation parks and nature reserves are vested in the National Parks and Nature Conservation Authority (NPNCA). These reserves are managed on behalf of the NPNCA by the Department of Conservation and Land Management (CALM).

The NPNCA is responsible for the preparation of management plans for all lands which are vested in it. These are prepared on a regional or area basis. Area plans for individual parks and reserves are being prepared on a priority basis. This plan complements the Regional Management Plan for the South Coast Region (CALM, 1992). Also relevant to the area in which the parks are located are the State Planning Strategy (WA Planning Commission, 1997) and the Albany Regional Strategy (WA Planning Commission, 1994).

According to the CALM Act, management plans should contain:

(a) a statement of the policies or guidelines proposed to be followed; and
(b) a summary of operations proposed to be undertaken for a specified period, not exceeding 10 years (Section 55.1).

Management plans should be designed, in the case of national parks, to fulfil so much of the demand for recreation by members of the public as is consistent with the proper maintenance and restoration of the natural environment, the protection of indigenous flora and fauna and the preservation of any feature of archaeological, historic or scientific interest (CALM Act s. 56.1.c).

ACKNOWLEDGEMENTS

The Planning Team and the Planning Advisory Committee are indebted to numerous individuals and organisations for assistance during the preparation of this Plan.

The input of those who made submissions and representations during the planning process and the contribution of the participants in the Park User's Workshop is gratefully acknowledged.

The Friends of Porongurup Range and Friends of Stirling Range National Park provided valuable input to the planning process. We also appreciate the assistance given by Ann Burchell, Lyall Harris, Ron Denny and Jack Williams**.**

Other organisations contributing to the Plan include the Shires of Plantagenet, Gnowangerup and Cranbrook, the City of Albany, the WA Museum, the Special Air Services Regiment, Main Roads WA**,** Water and Rivers Commission and Agriculture WA.

Special thanks go to Sylvia Leighton who collated the existing information available on the two Parks and to Kay Bailey who collated the visitor survey data for Stirling Range National Park.

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NOMENCLATURE

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

KEY STRATEGIES

The key strategies of this Management Plan are listed below. Page numbers refer to the location of the relevant Section in the body of the Plan. Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992.

PARK ZONING - Page 5

- Adopt the zoning schemes shown in Figures 4 and 5.
- Gazette the 'Special Conservation' Zone as a plant disease management area under Section 62(1)(f) of the CALM Act.

CLIMATE – Page 12

- Encourage research into local weather conditions which may have an influence on fire behaviour in the Parks including through the use of automatic weather monitoring equipment (see 'Fire').

NATIVE VEGETATION AND FLORA - Page 16

- Minimise the impact of plant disease on native flora (see 'Plant Disease').
- Use fire to establish and maintain diversity of vegetation ages (see 'Fire').
- *Continue surveys to record the distribution, abundance and other details of flora including those threatened or priority listed.*

FLORA OF SPECIAL INTEREST - Page 17

- *Implement the Albany District's Threatened Flora Management Program* (Robinson and Coates, 1995) *and any other relevant Wildlife Management Programs and Recovery Plans prepared during the life of this Plan.*
- Undertake management actions, such as the application of phosphite, to protect threatened or priority flora which are being affected by dieback disease as outlined in the Albany District Threatened Flora Management Program (see 'Plant Disease').
- Continue research into the biology and ecology of flora and vegetation of special conservation interest, with emphasis on developing knowledge of the effects of fire and dieback disease on survival and regeneration.

NATIVE FAUNA - Page 21

- Undertake feral predator control.

FAUNA OF SPECIAL INTEREST - Page 21

- *Protect and monitor populations of threatened and specially protected fauna.*
- Encourage research into the requirements of species of fauna of special interest in the Parks and make necessary changes to Park management practices in the light of research findings.

ECOLOGICAL COMMUNITIES OF SPECIAL INTEREST – Page 24

- Implement the management recommendations of the Interim Recovery Plan for the Eastern Stirling Montane Heath and Thicket Community.

BIOLOGICAL CORRIDORS - Page 24

- *In consultation with neighbours, Land Conservation District Committees, Catchment Groups and Local Authorities, seek to establish and ensure protection of vegetation corridors linking the Parks with other bushland.*

FIRE - Page 25

General Strategies

To achieve the objectives set for fire management in the Parks, three major fire strategies, 'No Planned Fire', 'Vegetation, Habitat and Fuel Management' and 'Fuel Reduction', are proposed.

No Planned Fire

- Efforts will be made to exclude fire from some areas for the life of this Plan to enable vegetation to mature.
- Representative areas of major vegetation types will be protected from fire as far as is practicable during the life of the Plan for retention as biological reference areas. This involves not only a policy of no planned fire but also entails protection of those areas by fuel reduction on their perimeters and reasonable efforts to suppress wildfires should they occur in these areas. Replacement areas will, where feasible, be sought for any reference areas which are burnt in wildfires during the life of this Plan.

Vegetation, Habitat and Fuel Management

- Planned fire will be applied in some areas at different times throughout the life of this Plan in order to manage vegetation and habitat by creating a mosaic of different fuel ages and habitat types and to provide an element of fire protection. The target is to have between 20 and 60 percent of the vegetation cover in each of these fire management units burnt under prescribed conditions during the life of this Plan. To the greatest extent practicable, the cumulative total burnt should be achieved in successive burns throughout the life of the Plan to maximise the diversity of vegetation ages in each fire management unit. Each Vegetation, Habitat and Fuel Management area will be reviewed annually in the light of any additional scientific knowledge to determine whether or not it should be burnt for ecological or protection purposes.

Fuel Reduction

- Fuel reduced areas will be maintained on most Park boundaries. The target is to have between 50 and 80 percent of the vegetation cover in each of these fire management units burnt under prescribed conditions in any fire. The rotation period between burns will vary depending on the rate of fuel accumulation within vegetation types with the possibility that some areas may require a second prescribed burn in the life of this Plan.

Specific Strategies

- Maintain close liaison and mutual aid arrangements with local Bush Fire Brigades, Park neighbours, Local Authorities and other agencies through the establishment and maintenance of local Fire Prevention Plans.
- Encourage the active involvement of local Bush Fire Brigades, Local Authorities, neighbours and the Bush Fire Service in all aspects of fire management in the Parks and consider the establishment of a fire advisory group which includes representatives of these interests.
- Prepare and implement a fire Master Plan from which annual fire management programs will be developed. Present annual fire management programs for endorsement at the relevant Local Authority Bush Fire Advisory Meetings.
- Continue to apply standard Departmental requirements for an approved prescription prior to initiating planned fire. The prescription should take particular account of environmental values, especially the need for *Phytophthora* dieback control and landscape management.
- *Reduce fuels using planned fire and where necessary, using techniques such as slashing and scrub rolling, in carefully selected strategic buffer areas either within the Parks, or where agreed with neighbours, on adjacent lands.*
- Endeavour to contain wildfires that enter or start in the Parks within a fire management unit defined by the strategic access tracks indicated in Figures 8 and 9. Suppression strategies may involve allowing the fire to burn out to low fuel areas, back burning from existing tracks or direct attack including the use of heavy equipment if essential. Choice of techniques will depend on values at risk, dieback disease risk, fire behaviour, resources available and presence of buffers and tracks.
- *Consistent with the requirement to protect life, property and nature conservation values, use planned fire to*

provide and maintain biological diversity.

- Close and rehabilitate all firebreaks which are not essential to the implementation of this Plan.
- *Monitor the effectiveness and impacts of fire management measures and make any necessary changes to procedures in the light of research and experience.*

PLANT DISEASE - Page 34

- *Prevent, as far as practicable, the establishment of dieback disease in new areas and minimise additional spread in areas where the disease already occurs by controlling access and operations in susceptible areas.*
- Undertake management actions, such as the application of 'phosphite', to protect threatened or priority listed flora and threatened ecological communities which are being affected by dieback disease as outlined in the Albany District Threatened Flora Management Program and other relevant recovery plans and guidelines.
- Implement the zoning proposals in the plan which seek to protect areas from the introduction of the *Phytophthora* pathogen (see 'Zoning' and Figures 4 and 5).
- Implement access restrictions in areas which are at risk from plant disease introduction by any activities in the Parks.
- *Improve understanding by the public and by CALM personnel of the dieback disease problem and protection measures in the Parks.*
- Encourage research to be conducted on the susceptibility of threatened and priority listed flora species and threatened ecological communities to dieback disease, implementing any strategies that can be practically developed to protect such species and communities through the Albany District Threatened Flora Management Program and other relevant recovery plans and guidelines.

INTRODUCED PLANTS - Page 37

- Develop and implement a specific weed control program for PNP which:
  - Identifies priority species and localities based on degree of infestation, invasive potential, size of infestation and ease of control;
  - Determines optimum control strategies;
  - Specifies rehabilitation requirements;
  - Involves the local community.

FERAL ANIMALS - Page 37

- *In conjunction with Agriculture Western Australia, LCDCs and adjacent landholders, develop programs to control feral animals.*
- *Carry out monitoring and control programs on feral animals.*

REHABILITATION - Page 38

- Develop and implement rehabilitation programs for each Park which:
  - Identify degraded areas in need of rehabilitation;
  - Establish priorities for rehabilitation;
  - Specify rehabilitation prescriptions for each priority area;
  - Provide for monitoring of rehabilitated areas and follow up action if required.

ABORIGINAL HISTORY AND CULTURAL RESOURCES - Page 39

- *Develop and implement management guidelines for Aboriginal sites in the Parks in liaison with the Aboriginal Affairs Department, WA Museum, tertiary institutions and Aboriginal organisations.*
- Continue to liaise with the local Aboriginal community on the significance of the Parks to Aboriginal people and on Aboriginal land use interests.

ATTRACTIONS AND EXISTING USE - Page 42

- Provide for a range of recreation opportunities in the two Parks consistent with the zoning scheme detailed in

‘Zoning’.

VISITOR ACCESS - Page 42

- Ensure that access routes are provided and maintained in a manner which optimises landscape appreciation while minimising the potential for erosion and the spread of plant diseases.
- Control bushwalking in areas temporarily or permanently closed for reasons such as dieback disease management, protection of threatened species and ecological communities, rehabilitation or impact from fire.
- Liaise with mountain bike enthusiasts regarding the designation of a path in PNP for use by mountain bikes.
- Investigate provision of cycling opportunities on existing vehicle access tracks in suitable flatter areas of SRNP.
- Provide and maintain access for visitors with disabilities at all new or upgraded vehicle accessible recreation sites.

PICNICKING - Page 48

- Provide at a minimum, picnic areas at the following locations in SRNP (see ‘Recreation Facilities’ and Figure 12 for further detail):
  - a site in the vicinity of Red Gum Pass Road,
  - three sites along Stirling Range Drive,
  - a site in the Moingup Spring area,
  - a site in the vicinity of Bluff Knoll
  - a site in the vicinity of Mt Trio, and
  - a site in the vicinity of Kojaneerup Spring.
- Provide at a minimum, picnic areas at the following locations in PNP (see ‘Recreation Facilities’ and Figure 13 for further detail):
  - a site in the Tree in the Rock area,
  - a site in the Castle Rock area, and
  - a site in the vicinity of the Scenic Drive.

NATURE APPRECIATION - Page 49

- Examine the feasibility of developing a visitor centre in SRNP in the vicinity of the Bluff Knoll Road and seek resources to enable construction and maintenance if its development is recommended (see ‘Information, Interpretation and Education’).

OVERNIGHT STAYS - Page 50

- Redesign the campground at Moingup Spring maintaining it as a low key facility.
- Cater for a range of camping requirements at the Moingup Spring campground, such as small or large group camping, and provide facilities for visitors with disabilities.
- Continue the current ban on camp fires within the Parks.

ADVENTURE ACTIVITIES - Page 50

- *Recognise and manage for adventure activities as legitimate forms of public recreation in the Parks subject to protection of conservation values, safety and the enjoyment of other visitors.*

ROCK CLIMBING - Page 51

- Designate an ‘Adventure Climbing Zone’ in SRNP including the eastern Bluff Knoll faces (commencing with the ‘Main North Face’) and extending to the eastern end of the main Range.

RECREATION FACILITIES - Page 53

- Provide facilities at the recreation sites indicated in Figures 12 and 13.
- Develop key recreation sites based on site development plans and in accordance with CALM standards.

COMMERCIAL VISITOR SERVICES - Page 54

- Identify opportunities for enhancement of visitor experiences in the Parks (including Aboriginal cultural tourism programs) and actively seek commercial operators to provide visitor services by way of leases or licences where appropriate opportunities are identified.

VISITOR SAFETY - Page 55

- *Regularly inspect roads and recreation sites to ensure that potential hazards are identified and signposted, removed or avoided by relocation of the facility.*
- Close parts or all of the Parks to visitors if necessary during periods of very high or extreme fire danger, or in the event of a serious wildfire in or threatening either Park. This may include evacuation of Park users.
- *In liaison with the Police Department, prepare plans for dealing with accidents and search and rescue operations.*
- Provide a 2WD accessible site suitable for use by helicopters only in search, rescue, training and other essential management operations in SRNP. (See also 'Military and Other Training').

INFORMATION, INTERPRETATION AND EDUCATION - Page 57

- Develop and progressively implement 'Information, Education and Interpretation Plans' for the Parks incorporating elements such as:
  - Information displays at key sites;
  - Interpretive programs or facilities (guided or self-guiding);
  - Signs and brochures providing information on features and use of the Parks and interpretation of their environments;
  - Media coverage of specific issues.
- Examine the feasibility of developing a visitor centre in SRNP in the vicinity of the Bluff Knoll Road and seek resources to provide for site assessment, design, construction and maintenance if its development is recommended.

LIAISON AND COMMUNITY INVOLVEMENT - Page 58

- In consultation with existing members, revise the structure and membership of the Planning Advisory Committee to create a group which will be available to provide advice to CALM regarding implementation of this Management Plan.

GRAVEL AND INDUSTRIAL MINERALS - Page 59

- Wherever practicable and in particular where they are required for use outside the Parks, obtain supplies of gravel and industrial minerals from outside Park boundaries.
- Consider sealing gravel roads in the Parks if maintenance costs of the gravel road exceed funds available. Current (1999) priorities are:
  - Stirling Range Drive;
  - Porongurup Scenic Drive.

MINERAL RESOURCE DEVELOPMENT - Page 59

- Oppose any exploration or mineral resource development activity which would have deleterious impacts on Park values.

MANAGEMENT ACCESS - Page 60

- Require managers to obtain a permit subject to NPNCA approval when seeking entry to the 'Wilderness' or 'Special Conservation' zones in the Parks for essential management purposes.

MILITARY AND OTHER TRAINING - Page 62

- Implement the Department's policy on 'Defence Force Training on CALM Managed Lands and Waters', seeking variations to its guidelines only in exceptional circumstances.

PARK NEIGHBOURS - Page 64

- Continue close liaison with Park neighbours over all Park management practices and encourage management of their lands in sympathy with Park objectives.

LOCAL AUTHORITIES - Page 64

- Continue to liaise closely with the Shires of Plantagenet, Cranbrook and Gnowangerup and the City of Albany on all issues affecting the management of the two Parks.
- Seek to have Bluff Knoll Road added to SRNP.
- Seek to have Bolganup Road from the intersection with the Scenic Drive to its terminus added to PNP.

TOURISM IN SURROUNDING AREAS - Page 65

- Liaise closely with local tourism bodies to ensure that management of the two Parks considers their role in the broader tourism sphere.

RESEARCH AND MONITORING - Page 66

- Actively encourage research by CALM staff and other individuals, institutions and organisations into areas of high priority, as identified in other sections of the Plan.

FUNDING - Page 68

- Actively seek a significant initial increase in the resources for SRNP and PNP to enable urgent completion of priority management actions.
- Continue to collect visitor fees in the two Parks and to collect fees for camping and other activities and services when feasible. Use the funds collected to assist with improving and maintaining Park facilities and services.

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FIGURES

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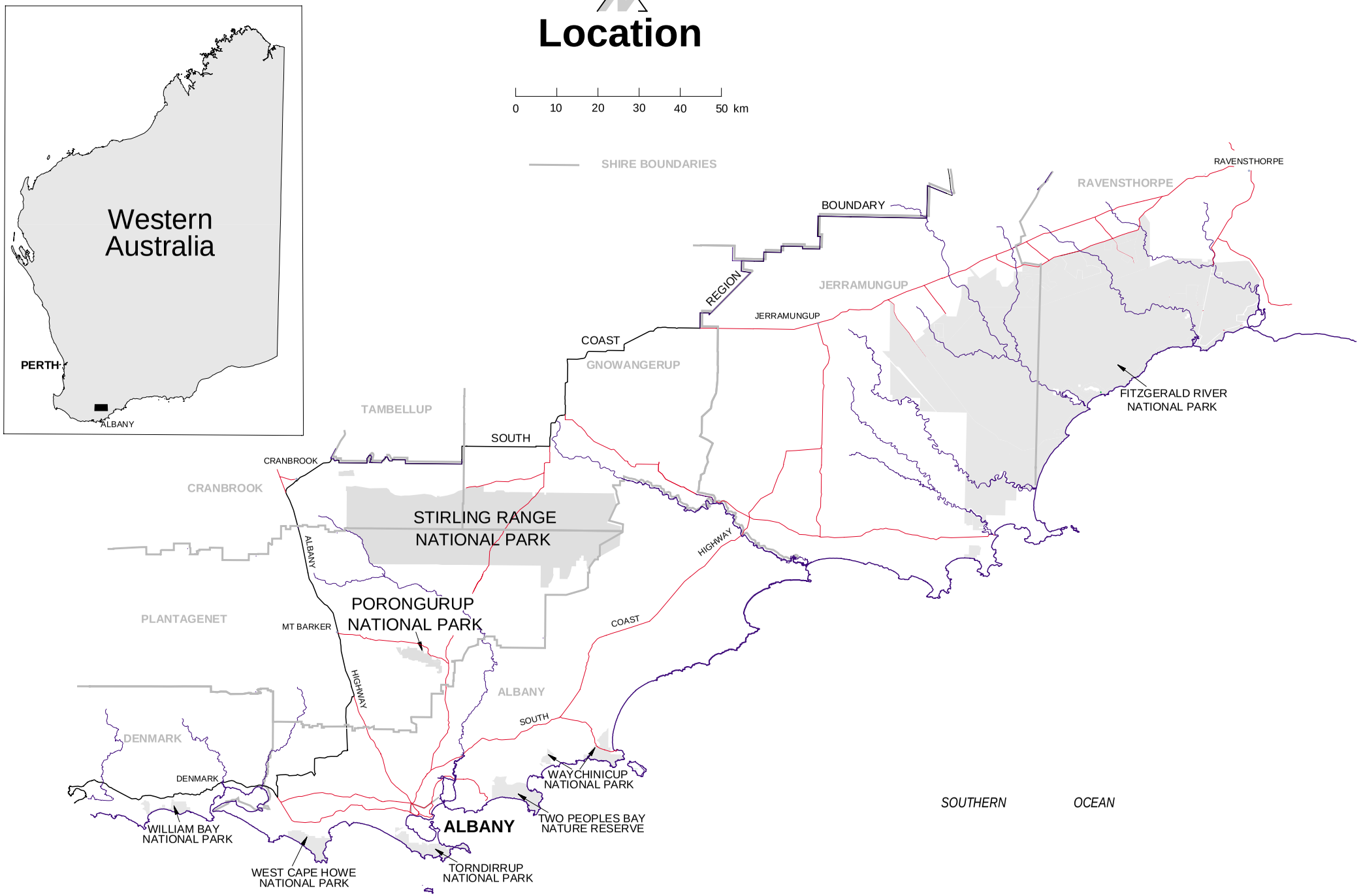

Location
0 10 20 30 40 50 km
SHIRE BOUNDARIES
Western Australia
PERTH
ALBANY
RAVENSTHORPE
BOUNDARY
REGION
JERRAMUNGUP
COAST
GNOWANGERUP
TAMBELLUP
SOUTH
CRANBROOK
STIRLING RANGE NATIONAL PARK
FITZGERALD RIVER NATIONAL PARK
HIGHWAY
PORONGURUP NATIONAL PARK
PLANTAGENET
MT BARKER
ALBANY
DENMARK
WAYCHINICUP NATIONAL PARK
TWO PEOPLES BAY NATURE RESERVE
WILLIAM BAY NATIONAL PARK
WEST CAPE HOWE NATIONAL PARK
TORNDIRRUP NATIONAL PARK
SOUTHERN OCEAN

INTRODUCTION

OVERVIEW

Stirling Range National Park (SRNP) and Porongurup National Park (PNP) are located in the south of Western Australia inland from the town of Albany (see Figure 1). The two Parks contain the most significant mountain ranges in southern WA and are important for both natural and cultural values. SRNP and PNP are both regarded as highly significant places to Aboriginal people. Both Parks are registered on the National Estate and are important elements in the landscape over a large area.

Stirling Range National Park

SRNP straddles the boundary between the Shires of Plantagenet, Cranbrook and Gnowangerup and the City of Albany. It comprises two reserves - number A14792 of 115 661 hectares and number 1090 of 259 hectares. The Park encompasses the Stirling Range and contains five peaks over 1 000 metres in height, Bluff Knoll (1 095 metres) being the highest peak in southern WA. An area in the vicinity of Hamilla Hills to the north-west of the main body of the Park is included in Reserve A14792.

SRNP is an area of international significance due to its extremely high level of biodiversity. The Park is home to over 1 500 species of flora, 82 of which are found nowhere else. In addition, the Stirling Range is a refuge for a number of Gondwanan relict species of fauna which cannot survive outside its cool, moist gullies. Dieback disease has had a major impact on the flora of the Park.

The relatively large size of SRNP, diverse flora and fauna, impressive landscapes and challenging peaks make the Park an attractive recreational destination. Adventure activities, camping and nature appreciation are all popular pursuits.

Porongurup National Park

PNP is located within the Shire of Plantagenet. It comprises a single reserve number A18987 and is about 2 621 hectares in size. The Park encompasses the bulk of the Porongurup Range which rises to a height of 670 metres at Devil's Slide.

The Porongurup Range includes a variety of vegetation assemblages from granite rock communities, through woodland, to an outlier of tall karri forest. Weed invasion is posing a threat to native vegetation communities. Like the Stirling Range, the Porongurup Range has also provided a refuge for Gondwanan fauna species and contains a wide variety of native animals.

PNP is a popular destination for visitors who engage mainly in walking, picnicking and nature appreciation.

The development of vineyards and a range of accommodation types in the Porongurup area has further enhanced its appeal as a recreation and tourism destination.

REGIONAL CONTEXT

The Stirling and Porongurup Ranges are well known landmarks being only a short distance inland from WA's south coast. Both are popular destinations for visitors and are likely to become increasingly popular as the tourist industry in the region expands, particularly in the area of nature-based tourism.

Both Parks are close to Albany, the regional centre, PNP being 48 kilometres and SRNP being 76 kilometres north of the town. The Parks are situated in rural areas, effectively being 'islands' of bush in a sea of largely cleared agricultural land.

The Parks are among 14 national parks in the South Coast Region of the Department of Conservation and Land Management (CALM). There are also a number of nature reserves surrounding the two Parks. Unvested Reserve No. 13081, with a purpose of 'Camping', near the north-east corner of SRNP, is used as a camping area by people undertaking bushwalks in the eastern part of the Park.

Both Parks are considered prime locations for scenic driving, wildflower viewing, bushwalking and rock-

climbing.

The Regional Management Plan for the South Coast Region (CALM, 1992) distinguishes three major 'types' of national park as related to the kinds of visitor use to which they are best suited. These 'types' are:

a) Parks with major wilderness potential;
b) 'low key' or intermediate Parks;
c) Parks with existing or potential major site or facility developments.

SRNP is well suited to category 'a', being large and relatively undeveloped, while PNP has been assigned to type 'b' mainly because of its much smaller size. The closest type 'c' park is Torndirrup National Park near Albany.

NATIONAL AND INTERNATIONAL SIGNIFICANCE

Both the Stirling and Porongurup Ranges are of biogeographical interest because restricted distributions of some plants (both relict and recently evolved) suggests that these mountain ranges may provide refuges for many species which have disappeared elsewhere. These include relict species of spiders and snails, dating back to Gondwanan times, which have been found in both Parks (see 'Fauna of Special Interest').

Although of low elevation by world standards, the peaks of the Stirling Range are recognised to have international significance by virtue of their biodiversity and isolation and because of issues such as plant disease management, fire and human impact.

The Stirling Range is the only mountain chain with peaks over one thousand metres in height in south-western Australia. The Range is nationally and internationally renowned for its mountain scenery and the colourful, unique and rare flora which it contains. Every year visitors from interstate and overseas come to view the display of wildflowers in spring. To date, 1, 530 species of plant have been identified within its boundaries and at least 82 exist only in the Stirling Range.

Despite its small size and limited range of habitats, the Porongurup Range is also known for its rich native flora of about 700 species. Ten of these plants are confined entirely within the Park boundary and others are at the inland margins of their geographic range. A major attraction of PNP is its karri forest which is believed to be an outlier population isolated for over 5,000 years and exhibiting a noticeable level of genetic divergence from the main karri belt populations to the west.

The rocks of the Ranges are seen as sources of information about the ancient supercontinent of Gondwana and research effort is uncovering some nationally and internationally significant facts about their origins (see 'Geology, Landforms and Soils').

RELATIONSHIP BETWEEN THE TWO PARKS

There are a number of similarities between SRNP and PNP both of which are located within the Albany District of CALM. Both are mountain national parks close to Albany, the regional centre of the area, and both are well suited to pursuits such as nature observation, pleasure driving and bushwalking.

From a management perspective too, there are great similarities as indicated throughout this Plan. Problems such as dieback disease, erosion, footpath maintenance, fire management and feral animal control are common to both Parks.

There is a very strong scenic connection between the two Parks. The Stirling Range is a focal element of the vista from locations on the north side of PNP and similarly, the Porongurup Range can be clearly seen from many of the high points in SRNP.

SRNP is over 40 times as large as PNP. In addition significant differences in geology and climate have led to the development of very different plant and animal communities in the two Parks. There is a significant degree of 'overlap' in visitor use of the two Parks among the longer staying visitors. (See also 'Attractions and Existing Use', 'Commercial Visitor Services', and 'Information, Interpretation and Education').

Rather than duplicating opportunities in the two Parks, this Plan proposes that recreation facilities utilise the special attributes of each Park.

COMMUNITY INVOLVEMENT IN THE PLAN

Prior to commencement of the Draft Plan, a Planning Advisory Committee was established. Fifteen members were chosen to represent a broad spread of community interests.

- Notices calling for expressions of interest were displayed through over 50 public outlets;
- 31 nominations were received;
- Nominees were evaluated using a matrix of interests, skills and experience;
- 15 members were chosen to represent a broad spread of community interests;
- The Committee held 17 meetings and two field trips during which every issue to be included in the Draft

Plan was given detailed consideration.

Broad community input to the development of the Draft Plan was sought.

- Notices advertising that the Plan was under preparation and inviting contributions were placed in State and local newspapers;
- A leaflet encouraging input to the Draft Plan was circulated to over 140 specific individuals and groups and made available through 39 individuals and public outlets;
- Newspaper articles called for public input;
- Radio interviews were conducted seeking contributions;
- A 'Park User's Workshop' was held to provide a forum for discussion of the Plan by Park users (Orr and Herford, 1992).

Further input to the Draft Plan was sought.

- Discussions were held with interested individuals and groups;
- Input was received from the Friends of the Stirling Range and Friends of the Porongurup Range during the planning process;
- The four Local Authorities affected by the Plan were consulted;
- A booklet summarising the proceedings of the Park User's Workshop was produced and distributed widely;
- Written submissions were received from 58 organisations and individuals prior to preparation of the Draft Plan.

The Draft Plan was released for public comment in April 1997, and 50 submissions were received. These submissions were considered in the development of this Final Management Plan including at a two day meeting of the Planning Advisory Committee. An analysis of public submissions is available as a supplement to this Plan.

MANAGEMENT PRINCIPLES

ROLE OF NATIONAL PARKS

The overall role for management of national parks as stated in the CALM Act (Section 56) is:

> 'to fulfil so much of the demand for recreation by members of the public as is consistent with the proper maintenance and restoration of the natural environment, the protection of indigenous flora and fauna and the preservation of any feature of archaeological, historic or scientific interest.'

NPNCA AND CALM MANAGEMENT POLICIES

This management plan is based on National Parks and Nature Conservation Authority (NPNCA) and Department of Conservation and Land Management (CALM) policies. These policies are derived from legislation, principally the *Conservation and Land Management Act 1984*, the *Wildlife Conservation Act 1950* and regulations made under these Acts. Policies are published and distributed throughout CALM as policy statements and are available to the public on request.

MANAGEMENT GOALS AND OBJECTIVES FOR STIRLING RANGE AND PORONGURUP NATIONAL PARKS

The management of SRNP and PNP will be consistent with the general role of national parks. Specific goals have been defined to cover the major management issues.

A goal is defined here as a 'long term desirable situation' (Underwood, 1989). Goals have been set for each major part of the Final Management Plan.

Conservation Goal
Conserve biological, physical, cultural and landscape values.

Recreation and Tourism Goal
Facilitate recreation and tourism in a manner compatible with conservation and other values.

Community Relations Goal
Promote informed appreciation of natural and cultural values.

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

Interaction With Nearby Lands Goal
Promote co-operation and minimise land use conflicts in matters associated with nearby lands.

Research and Monitoring Goal
Seek a better understanding of natural and cultural environments and the impact of visitor use and management activities.

To achieve these goals, objectives have been set in the relevant sections of the Plan. An objective is defined here as 'a clear statement of a result to be achieved which is oriented to a goal'.

LAND TENURE

The objectives are to:

- *Modify the boundaries of the Parks on the basis of conservation values and management considerations.*
- *Ensure that roads which traverse or border the Parks are managed in ways which are compatible with Park goals.*

Stirling Range and Porongurup NPs are two of WA's older national parks. They are both largely surrounded by cleared agricultural land and are traversed by roads managed by other agencies. Land tenure is shown in Figures 2 and 3. Lands surrounding the two Parks are discussed in 'Interaction with Nearby Lands'.

CALM endeavours to ensure that the management of roads within the Parks is consistent with Park management objectives with respect to design, construction and management standards (such as maintenance, dieback disease hygiene, signposting and landscape impacts). Where roads are confined within the Parks, CALM will seek vesting in the NPNCA.

Stirling Range National Park

SRNP comprises two reserves - A14792 and 1090. Reserve A14792 was created when the Range was temporarily reserved in 1908, with approximately 81 750 ha being vested in the Minister for Lands. The area was subsequently reserved for a 'National Park' in June 1913. The vesting changed to the National Parks Board in 1957 and it was officially named 'Stirling Range National Park' in 1970. Subsequent additions to the Park have increased its area to 115 920 ha. These include additions in the Hamilla Hill area to the north of the Park. Reserve 1090 at Kojaneerup Spring was originally an enclave within the Park vested in the Minister for Water Resources for the purpose of 'Water and Stopping Place'. It is used as a drought assistance water supply by nearby landowners. The reserve was added to the Park in 1994 and vested in the NPNCA with the purpose of 'National Park and Water', as proposed in the South Coast Regional Management Plan (CALM, 1992). The use of water from the reserve for drought assistance is discussed in 'Hydrology'.

SRNP is traversed or bordered by a number of public roads. Individual roads are controlled and managed by various different authorities (CALM, Main Roads WA, Plantagenet Shire, Gnowangerup Shire and/or Cranbrook Shire).

Porongurup National Park

PNP comprises a single reserve A18987. Two small outliers to the east of the range were formerly part of the Park but were changed to a nature reserve (A25705) in February 1991.

One enclave exists within the Park, this being Reserve 24151, vested in the Water Corporation for the purpose of 'Dam and Water Supply'. The Bolganup Dam is located within this reserve. A minor amendment to the boundary of Reserve 24151 has been made to allow for upgrade of the dam. Reserve 17644, a small disused gravel pit adjacent to the Park has been cancelled and added to the National Park. Millinup Road (Plantagenet Location 7569) was added to the Park in 1997.

Privately owned land adjacent to Castle Rock Road was purchased by the Government in 1987 for addition to the Park. The inclusion has since been formalised, and both blocks are now part of the Park. A small block of vacant Crown land adjacent to the western boundary of Plantagenet Location 138, was added to the park in 1997.

Although largely surrounded by cleared farmland, PNP does have further areas of privately owned uncleared land abutting its boundary. Negotiations on the inclusion of two such areas in the National Park have been taking place for some time.

There are other areas of uncleared bushland abutting the Park. As the boundary is extremely irregular, there may be further opportunities to purchase or exchange lands which would, if added to the Park, reduce its complexity for management.

PNP is also traversed or bordered by a number of public roads, controlled and managed by CALM and/or Plantagenet Shire.

STRATEGIES

1. **Seek inclusion in the Parks of any adjacent Crown lands which would enhance conservation values or would provide more effective management boundaries.**

2. **Consider for purchase and addition to the Parks any suitable private land which is available for sale.**

3. **Consider for exchange and addition to the Parks any private land which has outstanding natural values or practical management values.**

4. **Seek to have all roads which are confined within the Parks vested in the NPNCA.**

5. **Continue liaison with Main Roads WA over the management of Chester Pass Road where it traverses SRNP, and seek to minimise any**

detrimental impact on Park values due to use, maintenance or improvement.

6. **Continue to liaise with the authorities responsible for managing all roads traversing or bordering the Parks to encourage management in ways which are compatible with Park goals.**

PARK ZONING

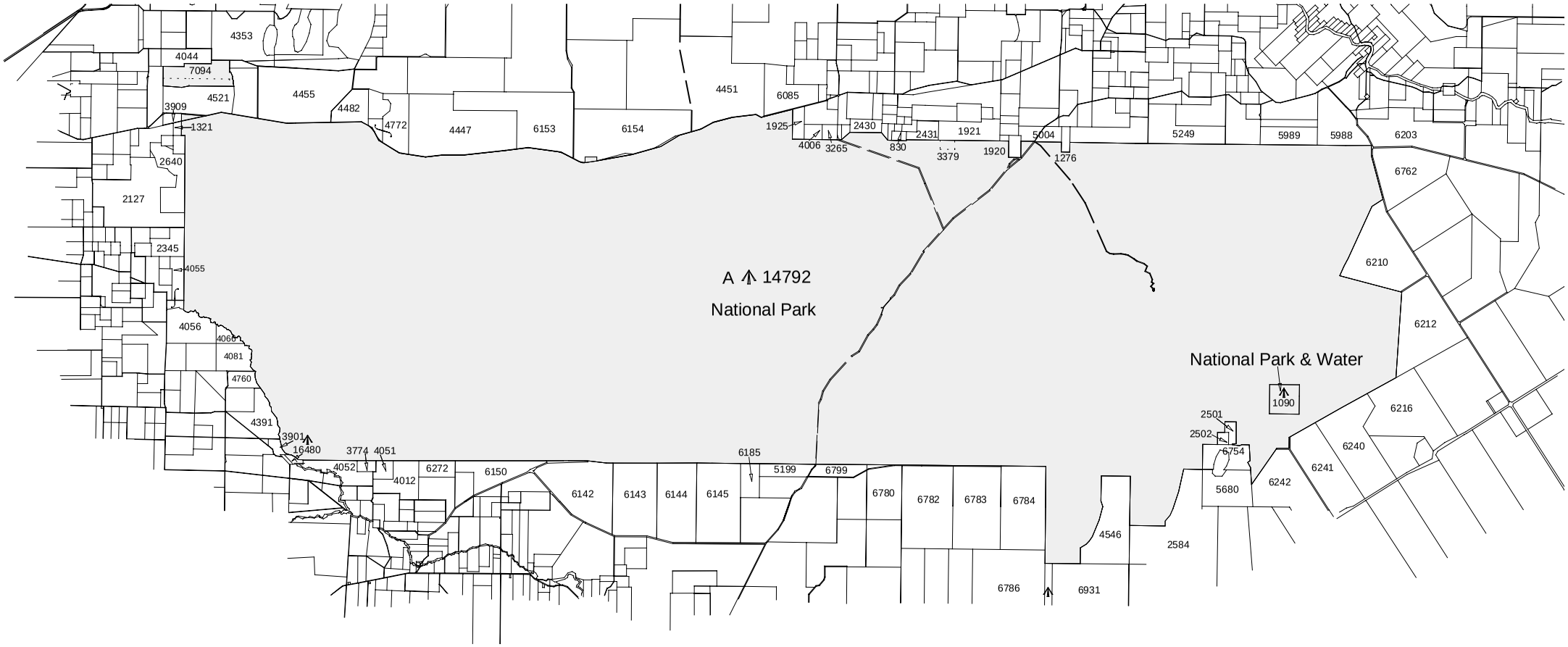
The objective is to implement a system of management zones which:

- *Protects vulnerable flora, fauna and land resources from the impact of visitor use;*
- *Facilitates the enjoyment of visitors to the Parks while minimising the impact of recreational uses upon conservation values;*
- *Minimises conflict between recreational users;*
- *Recognises the need to provide for a range of recreational opportunities in the two Parks and avoids unnecessary duplication in their provision; and*
- *Provides a basis for facility development and the management of access.*

As indicated in 'Relationship Between the Two Parks', there are many similarities between SRNP and PNP in terms of their suitability for recreational activities. However, differences between the Parks, particularly in scale, suit each one to different levels of facility provision. In addition, as discussed in 'Regional Context' the Regional Management Plan for the South Coast Region indicated that SRNP is a Park with 'major wilderness potential' while PNP is well suited to 'low key' (minimum facility, minimum impact) recreation.

Stirling Range National Park
Tenure

0 1 2 3 4 5 10 15 km



INSERT FIGURE 3

The zoning scheme for the Parks must cater for a wide range of current and potential experiences (or 'recreational opportunities') sought by visitors while ensuring that activities are matched to the capabilities of the land in question. Access restrictions may need to be applied in some areas at certain times to ensure that impact is minimised. The proposed zoning scheme for the Parks is shown in Figures 4 and 5 and is based on a discussion paper entitled 'Zoning for National Parks in Western Australia' (CALM, undated). PNP includes three zones, 'Recreation', 'Natural Environment' and 'Special Conservation'. SRNP, as well as including areas for these three zones also has a designated 'Wilderness' area. Table 1 describes these zones. Both Parks also contain a number of utility corridors. These are discussed in 'Public Utilities'.

STRATEGIES

1. **Adopt the zoning schemes shown in Figures 4 and 5.**

2. **Use the zoning schemes as a basis for the provision of facilities and services in the Parks as indicated in the sections of this Plan on 'Recreation and Tourism', 'Community Relations' and 'Commercial and Other Use'.**

3. **Ensure that the access controls indicated in the zoning schemes are enforced to minimise negative impact on the Parks' values and to separate incompatible activities so that they do not impact detrimentally upon each other.**

4. **Gazette the 'Special Conservation' Zone as a plant disease management area under Section 62(1)(f) of the CALM Act.**

5. **Introduce measures to manage visitor numbers in the 'Wilderness' Zone if required, to maintain the quality of the wilderness experience.**

Table 1.
ZONING

Zone	Description	Recreation Opportunities	M
Special Conservation	Areas which are the most intact examples of ecosystems in the Parks and which would be threatened by uncontrolled access. Introduction and spread of dieback and other diseases poses a major threat, though minor infections do occur within the zone. Permit required for access.	• Minimal recreation • Limited pedestrian access by permit may be provided, dependent upon seasonal conditions.	No facili
Wilderness	Extensive areas where evidence of human activity is minimal.	• Pedestrian access only, except in case of emergencies. • Experience of an environment with little or no human modification. • Little if any contact with other people.	Primitive Walking informati an absol
Natural Environment	Areas which can sustain, with minimum impairment, a selected range of low density activities with a minimum of related facilities.	• Non motorised recreation with limited access for vehicles to link up with paths etc. • Experience of an environment with little human modification. • Occasional contact with other people.	Minimun and inf provided on some access t
Recreation	Areas within which a range of recreation opportunities of medium to high density can be sustained with related facilities.	• System of 2WD access roads to major points of interest. • Experience of an environment with some modification. • Usual contact with people.	Basic fa areas, c interpret

***** **Evidence** of management is distinct from **level** of management. For example a wilderness zone may require a high level of management, especially for fire management but evidence of this activity would be low.

Stirling Range National Park
Zoning

0 1 2 3 4 5 10 15 km

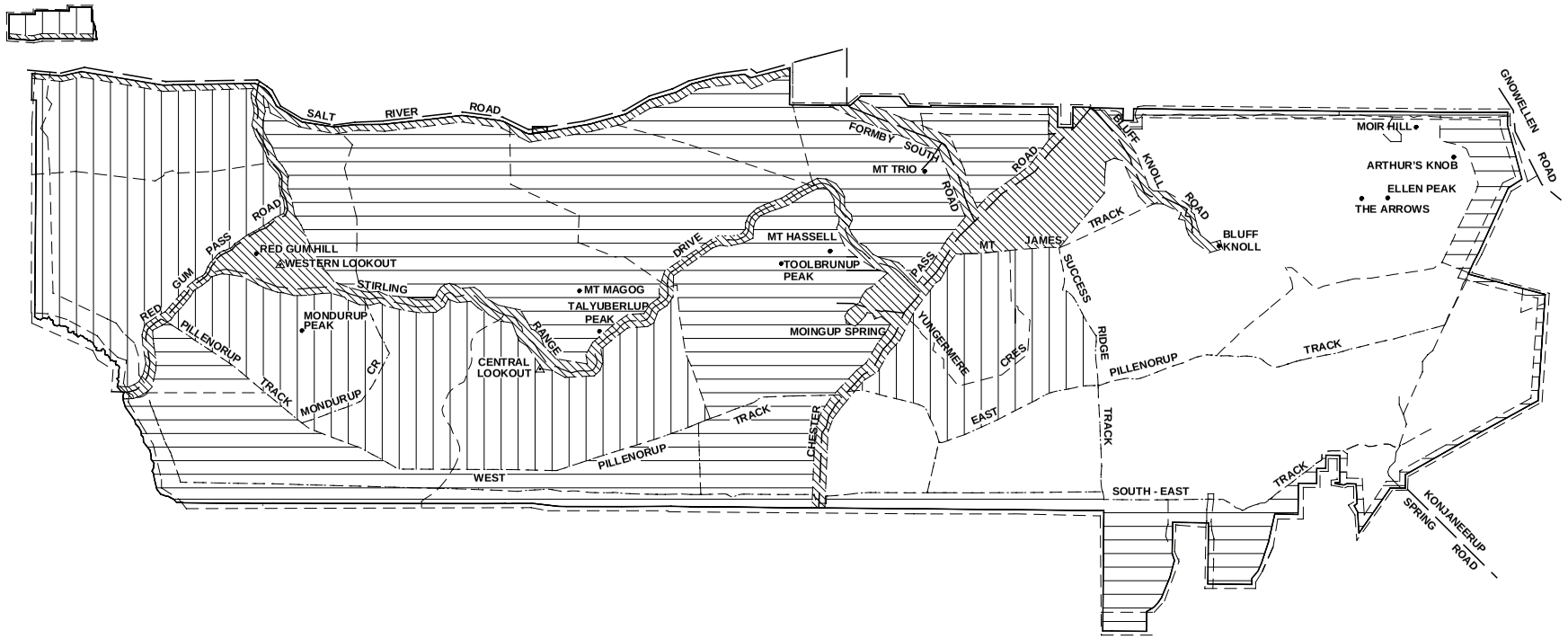
RECREATION

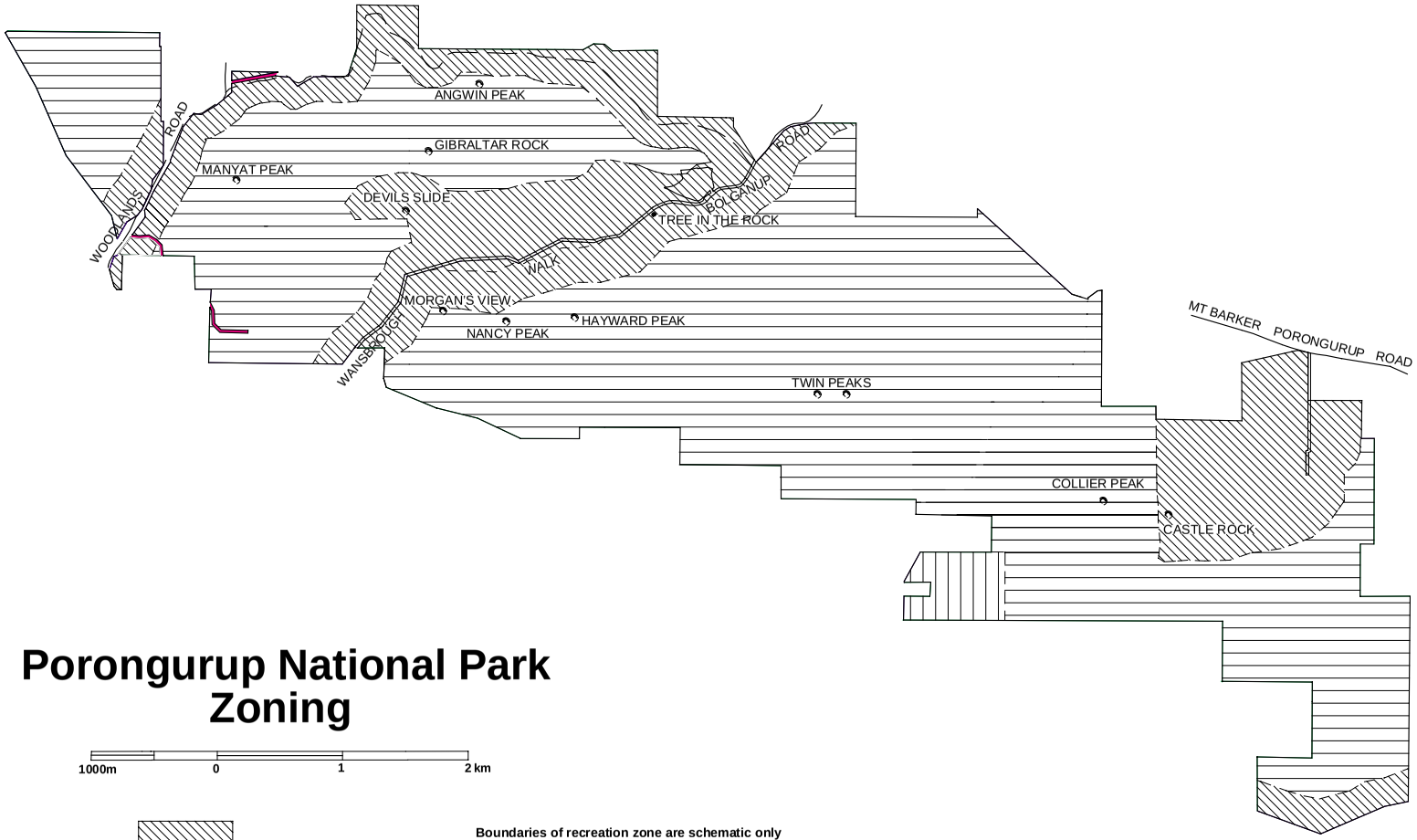
NATURAL ENVIRONMENT

SPECIAL CONSERVATION

WILDERNESS

Boundaries of recreation zone are schematic only and when parallel to roads, are approximately 250m from the edge.





Porongurup National Park Zoning

1000m 0 1 2 km

RECREATION

NATURAL ENVIRONMENT

SPECIAL CONSERVATION

Boundaries of recreation zone are schematic only and when parallel to roads, are approximately 250m from the edge.

CONSERVATION

CLIMATE

The objective is to ensure that the effects of climate are considered in all aspects of planning and operations for both Parks.

Both SRNP and PNP experience a typical Mediterranean climate of warm, sunny, dry summers and cool to mild, wet winters. Being located further from the coast, SRNP experiences a greater range of temperature extremes in both summer and winter than does PNP and conditions are generally drier. At higher elevations conditions are generally cooler and more humid and precipitation is greater.

The average annual rainfall for PNP is slightly more than 700 mm. Within SRNP there is a gradual decline in average annual rainfall from the south-west of the Park, with an annual total around 600 mm, to the north-east which receives less than 500 mm annually. The highest rainfall in SRNP is estimated to be about 1000 mm near Coyanarup Peak and Bluff Knoll. Higher peaks experience extended periods of continuous drizzle and cloud cover when winds are on-shore, even during the summer months. This additional precipitation has an important influence on the distribution of moisture-dependent plants and animals within the Range. Occasionally snow may fall on the taller peaks during winter and spring.

Prolonged periods of dry weather may occur during the winter months, resulting in rainfall being substantially below the annual average. In these years, vegetation may remain dry enough to burn throughout most of the year.

Prevailing winds during the winter months are generally from the west and bring cool, moisture-laden air. For the remainder of the year, prevailing winds are from the east and vary from moist on-shore breezes to dry winds originating over the continental land mass. Severe thunderstorms and lightning may be associated with pre-frontal troughs of low pressure which bring hot dry northerly winds. Winds in SRNP in particular are influenced locally by the arrangement of peaks and valleys in the Range and are often very erratic, making forecasting difficult.

Tropical cyclones periodically affect both SRNP and PNP, causing either high temperatures and extreme cyclonic winds or torrential rain and flooding. Heavy rainfall can also occur at other times during the summer months.

Climatic factors have an important influence on the management of both Parks. Heavy rainfall following intense winter storms or summer cyclones can cause rapid runoff on steep slopes and flash flooding of adjacent low lying areas.

Snowfalls attract many visitors to SRNP (and even at times to PNP). Large numbers of visitors arriving at such times have occasionally caused traffic congestion problems necessitating assistance from the police. Severe winter storms which bring snow, sleet and hail may also endanger bushwalkers who are not adequately prepared for such conditions. At any time of the year, drizzle and low cloud may reduce visibility on the taller peaks and make navigation difficult in either Park.

The climate of south-western Australia has changed significantly over the last 10 000 years and is believed to be at its most arid at present (Courtney, 1993). The results of this increase in aridity over time may be seen today in the number of relict species occurring in the Ranges (see ‘Vegetation and Flora’ and ‘Fauna’) particularly on the peaks.

There is world wide concern that the activities of humans may be accelerating the rate of change of the Earth’s climate. Should south-west WA become even more arid than at present due to these changes, the long term viability of those species surviving only in the mountains of the Stirling and Porongurup Ranges could be put at risk. It is important that the current species and their distribution are well documented so that the impact of climate change can be accurately

assessed.

STRATEGIES

1. **Implement as necessary, access restrictions in the Parks during moist conditions under which dieback fungus is most likely to spread (see 'Plant Disease').**

2. **Locate and design recreational facilities to minimise any unpleasant climatic effects.**

3. **Consider the provision of organised bus transport for Park visitors during snowfall events in order to reduce the traffic congestion caused by private motor vehicles.**

4. **Consider the range of weather conditions likely to be encountered when planning and implementing fire management activities, whether for planned fires or wildfires (see 'Fire').**

5. **Encourage research into local weather conditions which may have an influence on fire behaviour in the Parks including through the use of automatic weather monitoring equipment (see 'Fire').**

6. **Consider the implications of any evidence of climate change upon Park values and make changes to management practices if necessary.**

GEOLOGY, LANDFORMS AND SOILS

The objective is to protect the Parks' geological features and landforms from degradation and to provide information to visitors on their significance and vulnerability to damage.

Contained within national parks which have borders separated by only 20 kilometres, the Stirling and Porongurup Ranges have vastly different geological origins. Both ranges owe their formation to the massive tectonic forces which have shaped the southern and western coasts of Australia. SRNP is located on the southern edge of the Yilgarn Craton, the remains of part of the original continental land mass. The Albany-Fraser Orogen, a belt of deformed rocks 1200 to 1400 million years old, lies to the south of SRNP.

The Standing Committee for Geological Heritage of the Geological Society of Australia (WA Division) maintains a register of significant geological sites. There are no registered sites within the two Parks at present but any which are registered in the future should be afforded special protection from any possible damage.

Stirling Range

In contrast to the granites of the Porongurup Range, the Stirling Range is composed mainly of altered sandstones and shales. These rocks were laid down as sediment near the coast of an ancient sea, probably at the delta of a large river. Features such as bedding and ripple marks are found in many places throughout the Range and are evidence of the origins of the rocks. The beds are over 1 600 metres thick (Muhling *et al*, 1985).

Around 55 million years ago, sea level was up to 130 metres higher than at present and the shore line was along the southern edge of the Range. The peaks may have been islands when sea level was at its highest.

Recent findings of apparent fossils in the sediments of the Stirling Range have cast doubt over the previous interpretation of their age (Cruse *et al.*, 1993). The fossils, which are interpreted as those of jellyfish, suggest an age for the sediments of 540-590 million years, around half the previously determined age. This find is leading to a total re-appraisal of the geological history of the Stirling Range.

The Stirling Range is a series of isolated peaks and hills, rather than a continuous range. A layer of clayey soil characteristically forms at the mid-slope level throughout the Range. This layer impedes the flow of water and leads to moist conditions which favour the growth of dieback fungus.

In some places a layer of sand formed from eroded termite mounds covers the other sediments (Semeniuk, 1993). Soils in the park are best developed in the valley floors where water is also more plentiful, allowing the growth of different vegetation assemblages.

Gravel deposits suitable for road construction are in very short supply in the Park.

Porongurup Range

The Porongurup Range is composed of granite dated at around 1184 million years old (Black *et al*, 1992). The granite is believed to be a melted portion of the Australian continental plate that cooled under intense pressure deep in the earth's crust. Erosion of the surrounding metamorphic rocks resulted in the granites being exposed as a mountain range.

The granite hills of the Porongurup Range were true islands during the Eocene period 55 million years ago, when the sea covered coastal areas inland as far as the Stirling Range (Newbey, 1985). Features such as the Devil's Slide mark faults through the granite. On the lower slopes there are bands of laterite formed at the same time as the extensive laterites throughout the south-west.

The steep slopes of the Range are mantled with rock screes and sandy deposits washed down from the peaks. On the south-west corner of the Park, there is a small area of deep sand similar to the sand plains that occur to the north and east of the Range.

STRATEGIES

1. **In liaison with the Standing Committee for Geological Heritage, maintain a register of important geological sites in the Parks and ensure they are not damaged by Park management activities or visitors.**

2. **Keep confidential the locations of important geological sites which are vulnerable to damage.**

3. **Plan future vehicle and pedestrian access, firebreaks and site developments to ensure that vulnerable geological features, landforms and soils are not put at risk.**

4. **Provide interpretive information on the Parks' geology, its relationship with landforms, soils and vegetation and the vulnerability to damage of these features (see 'Information, Interpretation and Education').**

HYDROLOGY

The objective is to assist in managing the groundwater levels, surface water flows and water quality of the wetlands and river systems of the two Parks to help minimise land and water degradation in the area.

Both the Stirling and Porongurup Ranges influence precipitation, causing 'rain shadows' on their northern slopes. Moisture-bearing air from the south-west rises and cools as it reaches the mountains, causing greater rainfall on the southern than the northern slopes.

Rainfall runoff via surface drainage systems recharges groundwater systems of the Stirling and Porongurup Ranges. Vegetation cover is important as it slows surface flow thus reducing erosion and down slope sedimentation, and influences groundwater recharge.

Stirling Range

The area to the north and east of the Stirling Range is drained by the Pallinup River while the area to the north-west is drained by the Gordon River. The Kalgan-Young River drains areas in the south. These rivers and their primary tributaries are saline, however small creeks draining local catchments within the Stirling Range are fresh.

Lakes both in the north-east and south-east are the focus of rainfall run-off and to a lesser extent groundwater discharge, predominantly during the winter-wet season. Some lakes may contribute to groundwater recharge.

Most of the surface water flow in the Stirling Range ceases during the dry season. However, a few permanent pools (Moncrieff, 1977) and springs which are fed by groundwater discharge can be found along some of the rivers and their tributaries.

Groundwater production bores were established at Kojaneerup Spring and in the area of Pillenorup Swamp as a drought water supply for farms in the area (Davidson, 1977). Water has also been drawn from the pool at Kojaneerup Spring during times of drought. Long term use of the Kojaneerup bore and springs for drought relief is under review.

The north-eastern side of the Stirling Range has a semi-permanent water supply in the cascades/waterfall creek area below the slopes of Coyanarup Peak. Other creeks and drainage lines, such as the deep gullies in front of Pyungoorup Peak, are ephemeral with flows primarily associated with winter rainfall events. Surface water at the western end of the Stirling Range is present in creek beds following rainfall events which occur predominantly during the winter.

Groundwater investigations in the Stirling Range have been very limited as prospects are poor. For example, an examination of a portion of the area south and south-east of the Range by Berliat in 1951, indicated that most areas were not prospective for useable supplies of groundwater (Berliat, 1954).

Drought relief drilling was undertaken in the South Stirling and North Stirling districts between 1969 and 1971. The majority of the sites drilled did not obtain useable supplies. Drilling in 1977-78 inside the northern boundary of the Stirling Range National Park developed potable groundwater supplies from bores that currently supply two water tanks (off the Salt River Road) maintained by Cranbrook Shire.

Due to concern about the lack of water for wildlife at the western end of the Park, a water supply investigation was carried out by Moncrieff in 1977. The study found that potential groundwater supplies were available from Tertiary sediments located within river valleys. The groundwater salinity of these aquifers was usually high except where associated with good local recharge. Following this study, a small dam was constructed near the junction of Stirling Range Drive and Red Gum Pass Road fed by rainfall runoff from the western end of the Drive.

Porongurup Range

The majority of drainage courses flow north or south from PNP. One or two creeks have permanent flows while the rest flow only after heavy rain. The largest drainage line in the PNP is Bolganup Creek which normally flows throughout the year. Cockatoo Creek, the only other significant creek in the Park, flows in a southward direction from the eastern side of Castle Rock.

Bolganup Dam, situated in the lower catchment of the Bolganup Creek, is within 'Dam and Water Supply' Reserve 24151 and is used as a water supply for the towns of Porongurup and Mt Barker. This reserve is managed by the WA Water Corporation and is fenced. A contoured drain has been constructed through the Park to increase rainfall runoff to the dam.

In 1997 the NPNCA approved minor boundary changes to allow for an upgrade of Bolganup Dam. The structure has been modified to upgrade the stability and spillway capacity. In addition, a source protection plan for the Bolganup Dam catchment will be prepared by the Water Corporation. The Water Corporation is seeking agreement from the NPNCA for an easement, which will also serve as an access track, over its outlet pipeline from Bolganup Dam. Two other small dams are located within the Park. One is near the ranger station on the north side of the Park (not in use and soon to be closed) while the other is situated near Waddy's Hut.

STRATEGIES

1. **Liaise with Agriculture WA and the Water and Rivers Commission concerning the management of water in and around the two Parks.**

2. **Minimise any disturbance which could detrimentally affect groundwater, surface water flows or water quality of the wetlands and river systems in and around the two Parks and the flora and fauna dependent upon them.**

3. **Protect the water quality in streams (including ephemeral streams) which are used for human consumption or as water supplies for fauna.**

4. **Design and locate facilities such as toilets so that they do not pose a health risk by contaminating water supplies.**

5. **Monitor the quality of water supplies collected from roof catchments in the Parks to ensure their suitability for human consumption.**

6. **Continue liaison with the WA Water Corporation over the management of the Bolganup Dam adjacent to PNP and its catchment.**

7. **Maintain the existing dams at the junction of Red Gum Pass Road and Stirling Range Drive in SRNP and near Waddy's Hut in PNP.**

8. **Continue to permit the two bores and associated water tanks on the northern boundary of SRNP and managed by Cranbrook Shire to be used for water supply purposes.**

9. **Monitor abstraction, standing water levels and water quality of active bores at regular intervals.**

10. **In liaison with Agriculture WA, Office of Water Regulation and the Water and Rivers Commission, continue to review the long term use of Kojaneerup Spring and bore for drought relief.**

11. **Consider the potential impact of fire management activities on surface water runoff and groundwater recharge within catchments which extend into agricultural areas (see 'Fire').**

LANDSCAPE

The objectives are to:
- *Conserve the landscape values of the Ranges for observers within and outside Park boundaries.*
- *Provide opportunities for the appreciation of the landscape values of the Parks.*
- *Restore degraded landscapes.*

Both the Stirling and Porongurup Ranges are outstanding landscapes rising out of the surrounding plains. Both the Ranges fall within the Wheatbelt Plateau landscape character type and Merredin Plateau landscape character sub-type (CALM, 1994).

Rehabilitation of degraded landscapes is covered in 'Rehabilitation'.

Stirling Range

The Stirling Range stretches 62 kilometres in an east-west direction. It rises to 1 095 metres in height at Bluff Knoll, the highest peak in south-western WA and contains five peaks over 1 000 metres in height. It is easily visible from a distance of 60 kilometres and can be seen from as far away as Mt Frankland, 150 kilometres to the west.

The mountains display a colour range of grey-greens and dark grey-browns from close up through to blues and purples from a distance, depending on the light conditions.

The major human alterations to the landscape within the Range are caused by roads, carparks and gravel pits which are particularly visible from high ground. These appear as unnatural linear elements which, in the case of the gravel roads, stand out because of their strong red-brown colour.

Porongurup Range

Although much smaller than the Stirling Range, extending approximately 13 kilometres in an east-west direction, the Porongurup Range is also a spectacular element of the local landscape. It rises from the surrounding agricultural plain to a height of 670 m at Devil's Slide. The rounded granite domes of the Range are an impressive landscape feature for many kilometres around. The huge karri trees on the main range contrast with the jarrah/marri forest and low woodland vegetation of the lower slopes and enhance the impressive profile of the Range.

Excellent views of the Porongurup Range are visible from Millinup Road on the southern side. From the Porongurup Range, the most obvious landscape feature is the Stirling Range to the north. This contrasts dramatically with the surrounding flat countryside and agricultural land patterns.

The most visible human alteration to the landscape of the Range is the clearing on the northern side which was once operated as a farm. The cleared strip for the power line which services the repeater station at Manyat Peak is also noticeable. Roads in the Range are not highly visible due to the dense vegetation cover which exists in most developed areas.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. ***Ensure that any developments in the Parks, such***

as road construction and recreation sites, are undertaken with due regard to their potential impact upon visual qualities of the environment.

2. **Design and construct all Park facilities to be in keeping with the natural colours, lines, forms, textures and scales found in the surrounding landscape.**

3. **Use landscape impact assessments for all development projects and proposals.**

4. **Seek to lessen the visual impact of roads by using surfaces which are less conspicuous and which are sealed where possible.**

5. **Provide access to selected viewpoints throughout the Parks (see 'Recreation Facilities').**

6. **Identify and restore degraded landscapes (see also 'Rehabilitation').**

7. ***Provide, where possible, advice on request to private landholders and other agencies on minimising the visual impact of operations, especially on lands adjacent to or within the viewshed of lands in the Parks.***

8. ***Carry out a research program into landscape perceptions and preferences in the community.***

VEGETATION AND FLORA

NATIVE VEGETATION AND FLORA

The objectives are to:
- *Maintain the diversity of plant species.*
- *Conserve the range of vegetation communities.*
- *Increase the diversity of vegetation ages.*

The two Parks are located within the South-West Botanical Province of WA (Beard, 1979) but contain their own distinctive vegetation communities.

Stirling Range National Park

Because of its geographic location, geology and topography the Stirling Range has, even by Western Australian standards, a rich and varied flora and a diversity of plant communities. The total flora list currently stands at 1 530 taxa (Keighery, 1993). The Range is the centre of diversity for the typical southern Western Australian families, the Proteaceae and Epacridaceae, and contains over 20% of the known flora of southern Western Australia within its boundaries, including 82 endemic species.

Five major plant communities were distinguished in the Park by Beard (1979) and Keighery and Beard (1993). They are thicket, mallee-heath, woodlands, wetlands and salt lake communities (see Figure 6).

Porongurup National Park

The Porongurup Range is the inland representative of the numerous granite monadnocks that line the coast of the Albany area. The combination of raised hills and granite soils allows a range of plant communities from tall karri forest to low herblands to exist within the Park. At least 822 species of vascular plants have been recorded within the Park to date. Of these 113 are weeds (Keighery, 1998) (see 'Introduced Plants'). At least 26 species occur here at the inland margins of their ranges, including karri. This is the major feature of the flora of the Range. Over 300 species of macrofungi have also been found in the Range (Burchell, pers. comm.).

Beard (1979) recognised the Range as a separate vegetation system, the Porongurup System, characterised by the bare massive domes of the Range encircled by karri forest. Three major plant communities occur within the Park:

- Granite Outcrops;
- Karri tall forest; and
- Jarrah, marri forest to low woodland.

(see Figure 7).

Minor communities include mallee heath containing *Eucalyptus tetragona* and small areas of *Eucalyptus decipiens* mallee on along Millinup Road. These communities were extensively developed on what is now cleared land south of the Park. There is also a small swamp dominated by *Melaleuca preissiana* forming a paperbark low open woodland on the western margin of the Park. This extends outside the Park.

Strategies for weed control are located in 'Introduced Plants'.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. **Minimise the impact of plant disease on native flora (see 'Plant Disease').**

2. **Use fire to establish and maintain diversity of vegetation ages (see 'Fire').**

3. **Consider the needs of plant species and in particular, flora of special status, in fire management operations.**

4. ***Continue research to test hypotheses leading to an understanding of patterns and processes in ecosystems.***

5. ***Continue surveys to record the distribution, abundance and other details of flora including those threatened or priority listed.***

6. **Rehabilitate degraded vegetation in the Park as specified in 'Rehabilitation'.**

FLORA OF SPECIAL INTEREST

The objective is to protect and maintain viable populations of all plant species native to the Parks, particularly those of special status.

Both Parks contain flora of particular interest. Some of these flora have been declared as rare under the Wildlife Conservation Act (now known as 'threatened' flora). These are allocated to one of three categories depending on the degree of threat. (Note: 'Taxa' refers to any grouping of plants e.g. species, sub-species and hybrids). These categories are:

CE Critically Endangered
Taxa that are facing extremely high probability of extinction in the wild in the immediate future and in need of urgent research and/or management actions.

E Endangered
Taxa that are not critical but that are facing a very high probability of extinction in the wild in the near future and in need of urgent research and/or management actions.

V Vulnerable
Taxa that are not critical or endangered but are facing a high probability of extinction in the wild in the medium-term future and are in need of research and monitoring.

Other species have been allocated to a number of priority categories by CALM as their status is under review. CALM maintains a low temperature seed store which houses seed from some of the Parks' endemic flora.

Flora on the Threatened and Priority lists are reviewed periodically and may therefore change during the life of this Plan. Flora of special interest are managed under a Wildlife Management Program covering the Albany District (Robinson and Coates, 1995) and under individual species recovery plans.

Stirling Range

There are 82 species of flowering plants which occur only in SRNP. Brief notes about their biology are contained in Keighery (1993). Of these, 26 are declared rare (threatened) and these are listed in Table 2.

Porongurup Range

There are nine species of flora confined to the

Porongurup Range, of which two are threatened. These are *Villarsia calthifolia* which is categorised as endangered and is threatened by recreational pressures and fire; and *Apium prostratum* subsp. *phillipii* ms, which is categorised as vulnerable and is threatened by weed invasion.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. ***Protect and monitor populations of threatened flora.***

2. ***Where appropriate, manage habitat to favour threatened or priority listed flora.***

3. **Minimise disturbance to flora of special interest from visitor and management activities.**

4. ***Implement the Albany District's Threatened Flora Management Program (Robinson and Coates, 1995) and any other relevant Wildlife Management Programs and Recovery Plans prepared during the life of this Plan.***

INSERT FIGURE 6

INSERT FIGURE 7

Table 2.
THREATENED FLORA (1999) - STIRLING RANGE NATIONAL PARK

FLORA	THREAT CATEGORY	DIEBACK DISEASE STATUS	COMMENTS
=*Nemcia lehmannii*	Presumed Extinct	3	
Andersonia axilliflora	CE	1	Most populations severely impacted.
Caladenia bryceana subsp *bryceana*	CE	4	
Darwinia oxylepis	CE	1	
Deyeuxia drummondii	CE	4	
Drakaea confluens ms	CE	4	
Dryandra montana	CE	1	All populations severely impacted.
Leucopogon gnaphalioides	CE	1	Most populations severely impacted.
Persoonia micranthera	CE	1	Few live plants in 1998.
Banksia brownii	E	1	Most populations severely impacted.
Conostylis misera	E	4	
Darwinia collina	E	2	All populations in dieback infected vegetation.
Darwinia wittwerorum	E	2	
Daviesia pseudaphylla	E	1	All populations in dieback infected vegetation.
Dryandra anatona	E	1	All populations severely impacted.
Lambertia fairallii	E	1	Most populations severely impacted.
Sphenotoma drummondii	E	2	
=*Verticordia harveyi*	E	3	Only 2 populations known.
Acacia awestoniana	V	4	3 confirmed populations.
Adenanthos pungens subsp *pungens*	V	2	
Darwinia macrostegia	V	3	
Darwinia meeboldii	V	2	
Darwinia sp. Stirling Range. (GK5732)	V	2	
Darwinia squarrosa	V	2	
Verticordia carinata	V	2	
Xyris exilis	V	4	Not itself susceptible to dieback, but confined to 2 populations in an area where surrounding vegetation is severely affected by dieback. Killed by fire.

= Flora which are not strictly endemic but are almost confined to the Park.

Dieback Disease Status

1) Flora requiring urgent management intervention. These are subject to severe threat by dieback disease, occur in susceptible habitats and have a very restricted range.
2) Flora requiring urgent monitoring. These are subject to severe threat by dieback disease and occur in susceptible habitats, but have a wider range.
3) Flora requiring monitoring as susceptibility levels are often not established. These are potentially subject to threat by dieback disease and occur in susceptible habitats, but are often widespread.
4) Flora that exist as very small populations in the Park and are vulnerable to any form of disturbance.

5. **Undertake management actions, such as the application of phosphite, to protect threatened or priority flora which are being affected by dieback disease as outlined in the Albany District Threatened Flora Management Program (see 'Plant Disease').**

6. ***Assist in the development and implementation of strategies for threatened flora to ensure continued survival and expansion of populations, and develop Wildlife Management Programs or Recovery Plans when desirable.***

7. **Continue research into the biology and ecology of flora and vegetation of special conservation interest, with emphasis on developing knowledge of the effects of fire and dieback disease on survival and regeneration.**

8. **Maintain a database on flora of special interest including threatened and priority listed flora.**

FAUNA

NATIVE FAUNA

The objective is to maintain viable populations of all existing and re-introduced native fauna species within the Parks.

Since the early days of WA's settlement by Europeans, biologists were attracted to the Stirling and Porongurup Ranges.

The diversity of species found by early collectors indicated that the area was very species rich. Of the 36 species of native mammal believed to have existed in the Stirling Range at the time of European settlement, only 20, including the Numbat which was re-introduced to SRNP in 1998, have been recorded in the Park in the last 25 years.

Records for reptiles, amphibians and invertebrates are not comprehensive enough to permit conclusions to be drawn about long term trends. Bird species are still numerous in both Parks with over 140 species recorded from SRNP and over 70 from PNP. Fauna of special interest are covered in the next section of the Plan.

The impact of dieback disease on native fauna has not been directly studied in the Ranges. In the case of SRNP, however, significant changes in vegetation have resulted from the impact of dieback (see 'Plant Disease'). Studies in Victoria by Newell *et al* . (1991) indicate that changes in micro-habitat brought about by dieback disease are leading to a reduction in numbers of different mammal species and in their population sizes in infected areas. Birds and insects which depend on flora for food and shelter could be similarly affected while the impact on other fauna is unknown.

Invertebrates have been the subject of some recent research in SRNP, although no comprehensive surveys have been conducted. [See for example York Main (1985), and Friend and Williams (1993), as well as in relevant chapters of Thompson *et al.*, (1993)]. The invertebrate fauna of PNP is poorly known. Of particular interest however, is a number of invertebrate species which are relicts of the Gondwanan supercontinent of which Australia was a part until it split forming the current continents of Africa, Antarctica and South America. These species are discussed in 'Fauna of Special Interest'.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. ***Continue research to test hypotheses leading to an understanding of patterns and processes in ecosystems.***

2. ***Continue surveys to record the distribution, abundance and other details of fauna.***

3. **Undertake feral predator control.**

4. **Provide information to Park visitors and neighbours on the special qualities and need for protection of the Park fauna.**

FAUNA OF SPECIAL INTEREST

The objective is to determine the current distribution

of fauna of special interest in the Parks, to ensure their viability in the long term and to re-introduce species which have become locally extinct where this will enhance conservation values.

A number of fauna species of special interest have been recorded in each Park. Species of special status at present (1999) and the Park(s) in which they have been recorded since 1974 are shown in Table 3.

In addition, several species of mammal currently (1999) on the threatened fauna list are believed to have lived in SRNP earlier this century but none of these has been recorded in the Park in the last 25 years. These are the Bilby, Burrowing Bettong, Chuditch, Crescent Nailtail Wallaby, Red-tailed Phascogale, Western Barred Bandicoot and Western Ringtail Possum. Under CALM's 'Western Shield' program, it is proposed to reintroduce to the Parks a number of fauna species which have become locally extinct (see also 'Feral Animals'). As part of this program, numbats were re-introduced to SRNP in 1998.

Clearly it is essential to consider the habitat and other requirements of threatened species currently living in the Parks or reintroduced in the future, when planning management actions. The management implications of these requirements are considered in other sections of this Plan.

In addition to the vertebrate species which are threatened, a number of invertebrate species in the Parks are of special interest. A number of trapdoor spider species have been collected. These include the palisade spider *(Neohomogona stirlingii)* which is endemic to the Stirling Range. Two additional new species of *Neohomogona* have recently been found in SRNP: one on Toolbrunup (Barrett 1996) and one from the Ellen Peak/Pyungoorup area (Harvey et al, 1996 unpublished). *Neohomogona bolganupensis* is endemic to the Porongurup Range.

Another genus of spider, Moggridgea is also found in the Parks. There may be more than one species of Moggridgea in SRNP (Harvey and Main 1997). The species known as the 'Stirling Range Moggridgea' is included on the current (1999) list of threatened species. A species of Moggridgea found in PNP builds nests on the bark of very old, long unburnt karri trees (Harvey and Main 1997). Recent biological survey work has also identified other endemic species of spider - *Toxops* sp. and a harvest spider from the family Caddidae (Barrett, 1996).

These spiders all require cool, damp conditions and may be vulnerable to fire.

Land snails too, inhabit the moist uplands of the Ranges. Two species of *Bothriembryon* snails have been found in the Stirling Range. An undescribed carnivorous snail belonging to the Paryphantidae family was collected by B. Wilson. A small population of a very rare land snail of the family Rhytididae has recently been discovered in SRNP. (Kendrick, pers. comm.). This species is included on the current (1999) list of threatened fauna. A species of giant earthworm *(Megascolex* sp.), also occurs in both Ranges. Like the trapdoor spiders and land snails mentioned earlier, it is a relict species and depends on very wet soil and shaded sites (York Main, 1993).

One of the few known locations of the small brown azure butterfly (*Ogyris otames*), is found in SRNP wandoo woodland. *Armillaria* fungus is killing broom bush *(Choretrum glomeratum)* in this area, the only food plant of the butterfly larvae (Wills and Kinnear, 1993).

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. ***Protect and monitor populations of threatened and specially protected fauna.***

2. **Encourage research into the requirements of species of fauna of special interest in the Parks and make necessary changes to Park management practices in the light of research findings.**

3. ***Assist in the development and implementation of strategies for each threatened or specially protected fauna species to ensure continued survival and expansion of populations, and develop Wildlife Management Programs and Recovery Plans when desirable.***

4. ***Where appropriate, manage habitat to favour threatened or specially protected fauna.***

5. **Re-introduce locally extinct species of native fauna where this would be consistent with Park goals.**

6. ***Continue surveys to record the distribution, abundance and other details of fauna species which are threatened or specially protected.***

7. ***Implement the Department's Wildlife Management Programs and Recovery Plans for any relevant fauna species for which a program is prepared during the life of this Plan.***

Table 3.
FAUNA WHICH ARE THREATENED OR IN NEED OF SPECIAL PROTECTION (1999)

SPECIES Records since 1974	**STATUS* and CATEGORY****		**SR NP**	**P NP**
MAMMALS				
Western Ringtail Possum *(Pseudocheirus occidentalis)*	T	V		✓
Quokka *(Setonix brachyurus)*	T	V	✓	
Numbat *(Myrmecobius fasciatus)* (Reintroduced to SRNP in 1999)	T	V	✓	
BIRDS				
Western Whipbird *(Psophodes nigrogularis oberon)*	T	V	✓	
Mallee Fowl *(Leipoa ocellata)*	T	V	✓	
Carnaby's Cockatoo *(Calyptorhynchus latirostris)*	T	E	✓	✓
Baudin's Cockatoo *(Calyptorhynchus baudinii)*	T	V	✓	✓
Peregrine Falcon *(Falco peregrinus)*	SP	-	✓	✓
REPTILES				
Carpet Python *(Morelia spilota imbricata)*	SP	-	✓	✓
INVERTEBRATES				
Stirling Range Moggridgea spider (*Moggridgea* sp BY Main 1990/24)	T	E	✓	
Stirling Range Rhytidid snail Undescribed Rhytidid sp. (WAM#2295-69)	T	V	✓	

KEY

* STATUS

T Threatened

A taxon may be declared as threatened fauna if it has been established that in the wild the taxon meets one or more of the following criteria:

- It is presumed to be extinct;
- It is in imminent danger or is threatened with extinction, i.e. it is likely to decrease in numbers and possibly become extinct if factors causing its decline continue to operate;
- It is dependent on or restricted to habitats that are vulnerable and/or subject to factors which may cause its decline; or
- It is very uncommon, even if widespread.

SP In Need of Special Protection

A taxon may be declared as in need of special protection if it meets any of the criteria for threatened fauna or if it has been established that in the wild the taxon meets one or more of the following additional criteria:

- It is likely to be taken because of high commercial value and the standard penalty for taking is insufficient deterrent; or
- It is uncommon, but not threatened at present, but is either of commercial or intrinsic value or is perceived to be damaging a commercial or hobby enterprise, and taking may lead to the taxon becoming threatened.

** CATEGORY (FOR THREATENED SPECIES)

CE Critically Endangered

- Taxa that are facing extremely high probability of extinction in the wild in the immediate future and in need of urgent research and/or management actions.

E Endangered

- Taxa that are not Critical but that are facing a very high probability of extinction in the wild in the near future and in need of urgent research and/or management actions.

V Vulnerable

- Taxa that are not critical or endangered but are facing a high probability of extinction in the wild in the medium-term future and are in need of research and monitoring.

ECOLOGICAL COMMUNITIES OF SPECIAL INTEREST

The objective is to protect and maintain viable occurrences of ecological communities in the Parks, particularly those of special status.

An ecological community is defined as a naturally occurring biological assemblage that occurs in a particular type of habitat.

A threatened ecological community is one which is found to fit into one of the following categories defined by English and Blyth (1997):

- Presumed Totally Destroyed;
- Critically Endangered;
- Endangered;
- Vulnerable.

The Eastern Stirling Range Montane Heath and Thicket Community has been recognised as a Critically Endangered threatened ecological community on the basis of limited distribution and the threat posed to the community by *Phytophthora cinnamomi*.

STRATEGIES

1. **Implement the management recommendations of the Interim Recovery Plan for the Eastern Stirling Montane Heath and Thicket Community.**

2. **Conduct further survey to record the existence and status of ecological communities within the Parks and undertake appropriate management actions to conserve them.**

3. **Implement the Department's Wildlife Management Programs and Recovery Plans for any relevant ecological communities for which a program is prepared during the life of this Plan.**

BIOLOGICAL CORRIDORS

The objective is to enhance conservation values by encouraging the establishment and management of corridors of native vegetation linking the Parks with other bushland.

The most obvious change to the natural habitat around SRNP and PNP is the clearing of native bushland for the purpose of agriculture. Although isolated, the Parks are expected to protect flora and fauna, ecological processes and landscape values, functions previously performed by the whole landscape. The protection of these values can be considerably enhanced if the main 'islands' of natural bush are connected by bush corridors to other remnants (see Saunders *et al.*, 1991).

Around SRNP and PNP, some remnants of native vegetation remain. Many studies stress the importance of vegetation remnants and encourage programs to promote their conservation (see Saunders *et al.*, 1987).

Some populations of small vertebrates are able to survive only because they can move between vegetation remnants on and through vegetation corridors which transect the intervening farmland (Bridgewater, 1987). Where vegetation corridors no longer exist, they can be re-created by the planting of native vegetation. This can be accomplished by the upgrading of riverside, roadside and other reserves or by the creation of new corridors across cleared land. Road reserves in the area vary from well-vegetated to degraded. On-going liaison with managing authorities is required to foster retention and enhancement of roadside vegetation in the area.

Linkages of vegetation remnants are important for the promotion and maintenance of landscape diversity as well as for the movement of fauna.

As indicated in 'Regional Context', there are a number of nature reserves and other reserves in the immediate vicinity of the two Parks.

Remnant bushland exists in reserves and on private property surrounding both the Parks. It is possible that native fauna residing in the Parks use these remnants as corridors for movement outside the limits of the Park borders.

In the long term, it may be possible to develop vegetation corridors from both SRNP and PNP southwards to link with existing coastal reserves. In addition, corridors could be established to the east and north-east of SRNP to link with the Pallinup and Corackerup River corridors. Vegetated road reserves are currently the major component of existing

corridors. Full establishment of vegetation corridors would involve plantings on a considerable scale as there are large distances between some remnants of native bushland. There is strong community interest in the development of corridors across private farmland from groups such as the North Stirlings LCDC and the Malleefowl Preservation Group based in Ongerup.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. ***In consultation with neighbours, Land Conservation District Committees, Catchment Groups and Local Authorities, seek to establish and ensure protection of vegetation corridors linking the Parks with other bushland.***

2. ***Encourage detailed surveys of biological values of vegetation corridors and the use of information obtained as input to revegetation and management programs.***

3. **Conduct research into the corridor requirements of regional fauna to facilitate the establishment of effective corridors.**

4. ***Provide information to the public on the value of vegetation corridors and on their protection.***

FIRE

The objectives are to:

- *Protect the lives of Park visitors, neighbours, fire fighters and staff from wildfires.*
- *Protect physical and landscape values, buildings and other assets in the Parks and neighbouring properties from any negative effects of wildfire or suppression techniques.*
- *Increase diversity in vegetation ages.*
- *Maintain the natural abundance and composition of major vegetation associations and fauna habitats particularly those necessary for the survival of threatened or restricted species and ecological communities.*
- *Conserve fire vulnerable species and communities.*
- *Limit, as far as practicable, the extent of fires so that no more than fifteen percent of either Park is burnt in any one year.*
- *Reduce the risk and frequency of wildfires resulting from human activity starting near to or within the Parks.*
- *Increase knowledge of the effects of fire on natural processes.*

Fire is a natural phenomenon on WA's south coast. Lightning storms occur regularly during the summer months and in some years are responsible for many fire outbreaks.

Aboriginal fire use in the Stirling and Porongurup Ranges was documented by explorers and botanists in the 1840s. Most accounts describe a relatively small scale mosaic of burnt and unburnt patches maintained by regular firing of the bush. This burning appears to have been deliberate and regulated, and co-ordinated into the patterns of seasonal movement and activity (Hallam 1975).

During the period of active clearing for agriculture up until the 1970s, fires escaping from clearing activities on adjacent lands burnt large sections of both Parks, sometimes repeatedly. Prior to about 1970, fire management in both Parks was undertaken by volunteer bush fire brigades and by local residents and tended to concentrate on patch burning during spells of fine weather in late autumn.

Following the appointment of permanent ranger staff, emphasis was placed on the construction of tracks and perimeter firebreaks, aiming to reduce the likelihood of fires spreading into or out of either Park and to provide a network of blocks in which some limited fuel reduction burning could be undertaken. Narrow perimeter buffers have been found by experience to have a number of drawbacks. These included the difficulty of burning shrub fuel types effectively, without undue risk of escape and the limited fire control benefits of narrow buffers in taller forest types. The extensive network of tracks required also proved costly to maintain and had some undesirable environmental consequences including plant disease spread, soil erosion, uncontrolled vehicle access and spread of weeds and feral animals.

Both Parks contain populations of threatened flora, some of which occur in areas subject to periodic fires.

Both Parks also contain extensive areas of elevated terrain (see 'Landscape') which dominate the landscape and are significantly impacted after extensive, high intensity fires. Fire may also affect a number of the recreational activities which are focused on the mountain peaks by temporarily altering vistas, walking access and the condition of campsites. Surface water runoff may be temporarily increased after vegetation is burnt due to reduced water uptake by plants. Groundwater recharge rates may also be affected.

Rangers' residences in both Parks are a high priority for protection from fire. Other Park facilities requiring protection include picnic sites, amenities blocks, interpretive displays and constructed paths (see 'Recreation Facilities').

Severe fire weather conditions occur regularly in both Parks, generally during the dry summer and autumn months. An average of 27 days of very high or extreme fire danger occur in this part of the south-west each year.

Both Parks contain areas of steep topography which create turbulence and therefore affect wind strength and direction at the local scale. The rate of spread of fires burning upslope is also increased. Areas with southerly aspect receive less sunlight and more rainfall and tend to remain moist for much longer than areas of northerly or westerly aspects. Natural barriers to the spread of fire exist in both Parks in the form of large rock outcrops and scree slopes.

CALM has a duty to manage fire in a responsible way. Fire management can include attempts to exclude fire from certain areas as well as the use of planned fire, also known as prescribed burning. The conditions under which a successful outcome is most likely to be achieved are prescribed in advance. In general, if planned fire is considered necessary to achieve the fire management objectives in a particular area, the following steps, adapted from Sneeuwjagt (1989), are carried out:

- A Master Burning Plan is prepared showing those areas in which fuels are to be periodically reduced by planned fire. Such plans also show those areas allocated for other fire regimes. The plan should also designate proposed season of burn, and/or fire intensity. Some burn plans may also include a planned fire area coverage required to achieve an effective buffer to wildfire.

- An annual burn program is derived from the Master Plan, in which individual burns are identified and prioritised.

- Each job is surveyed in detail well in advance of the burn. These assessments include an environmental and safety checklist, fuel type and quantity measurements, and a check of boundaries, problem areas and values requiring special attention.

- A detailed burn prescription is prepared for each burn in which the ideal lighting pattern and weather and fuel conditions are calculated from fire behaviour predictions. These prescriptions are required to be checked and approved by specialist staff. The preparation and burning of burn boundaries (or 'edges'), and the core ignition either by ground crews or aircraft, must follow very strict and well-rehearsed departmental operational instructions and guidelines.

- All completed burns are assessed to check compliance with the burn prescription. Records of the post-burn assessments are stored for future reference by the operations staff and fire research specialists.

Individual burn prescriptions will generally aim to exclude fire from areas that may be particularly vulnerable to the effects of frequent or intense fire in the life of the Plan (e.g. some peaks; some habitat of fauna of special interest).

It is important to recognise that all fire management strategies, whether active or passive, carry an element of risk that the objectives will not be fully met. For example, allowing fuels to build up to high levels within either Park carries with it the risk that when a fire does start, it will burn at high intensity, have a considerable impact on the vegetation and be difficult to suppress, even during mild weather conditions. Such a policy may therefore jeopardise the achievement of objectives such as the conservation of vulnerable flora, fauna and ecological communities. On the other hand, a planned fire may occasionally burn more fiercely than

expected. The aim of fire management planning is to minimise these risks. However, the risks will never be totally eliminated.

Large areas of even-aged vegetation unburnt for more than ten years provide the potential for wildfires to burn a significant proportion of each Park in a single event, an outcome which is incompatible with many of the objectives in this section. It is considered essential to create mosaics of different vegetation ages in both Parks in order to ensure that the objectives are met.

Stirling Range National Park

SRNP has experienced a number of extensive fires during the past 20 years, some caused accidentally, some deliberately lit and others resulting from escapes from planned fires within the Park itself.

Lightning strikes occur regularly in the Park, mainly during the summer months. Lightning was responsible for a fire which began on Mt Toolbrunup in January 1996 and burnt over 10 000 hectares. It also caused fires in January 1997 and April 1999 which resulted in over 17 000 ha being burnt at the western end of the Park and 2 000 ha in the central area respectively.

Areas of long unburnt vegetation (> 50 years) in SRNP merit continued fire exclusion because of their value as biological reference areas. Such areas occur mainly in the south east of the Park in 'No Planned Fire' areas. Most of the eastern third of SRNP was burnt in 1991 and over 37 000 ha in the centre of the Park was burnt in 1996 and 1997. It is planned to exclude fire from some of these areas.

Apart from isolated patches of open jarrah-marri forest, the vegetation of SRNP consists mainly of wandoo woodlands, mallee-heath and shrub thickets. Fires in wandoo woodlands behave similarly to those in jarrah-marri forest but tend to be less intense because the understorey is very open and leaf litter accumulations are relatively low (typically less than 10 tonnes/ha). In contrast, fires in mallee-heath and thicket vegetation spread through the shrub layer consuming both live and dead foliage as well as whatever litter is present on the ground. Fires in mallee-heath are particularly prone to sudden and violent changes in behaviour which are difficult to predict (McCaw, 1995). Shrub fuel types occasionally become dry enough to carry fire during periods of low rainfall in the winter months.

A number of research projects relevant to fire management have been conducted in the Park. In 1989 CALM research scientists established a comprehensive study into the behaviour and effects of fire in mallee-heath communities within SRNP. Key findings to date indicate that leaf litter fuels in mallee-heath must be very dry (moisture content less than 8%) before fires will sustain and spread. Fires in mallee-heath do not backburn against the wind to any great extent and do not normally continue burning over night under moderate summer conditions, although they may re-ignite from burning stumps the following day. Conditions during winter and early spring are rarely suitable for planned fires in mallee-heath. This situation contrasts somewhat with the denser types of thicket and heath found on the taller peaks in the Range in which fires will backburn even down slopes and typically stay alight over night.

Post-fire regeneration of plant communities is also being monitored in conjunction with these studies. To date, the studies have found that plant species composition and rate of post-fire regeneration are not greatly influenced by the season of burning.

The response of vertebrate fauna and some groups of invertebrates to spring and autumn burning has been investigated experimentally at the same location (Friend, 1993). Findings to date indicate that the size and frequency of fires (rather than intensity) are the most important factors impinging on faunal species composition and abundance.

Preliminary data available for SRNP suggest that fires at intervals of 12 to 15 years or more are unlikely to be a direct threat to the persistence of species of plant or animal within the Park. Fires at more frequent intervals may not provide the opportunity for all plant species to accumulate substantial seed stores or for some habitat characteristics to develop. Other preliminary research on grass trees within the Park indicates that pre-European fire frequency may have been approximately 8-10 years in at least some areas of the Park. (Ward, pers. comm.) Pending the results of further research into the relationship between fire frequency and the maintenance of biodiversity, the proportion of the Park burnt more frequently than about 12 to 15 years will be kept to a minimum and

prescriptions will aim to leave unburnt patches in these areas.

Areas that have been burnt within the last 10 years should be protected from the potentially negative impacts of wildfires and high intensity fires. This protection should include the introduction of some fire during the life of this Plan to break up fuel ages, thereby limiting the possible size of any wildfires in future.

Intensity, size, season and frequency of planned fires should be varied as much as possible to produce a mosaic of different aged areas which can provide a range of resources for a wide variety of plant and animal species.

Fire management in the Park has relied to a large extent on the existence of buffers to contain fires. A series of salt lakes on its south-east boundary acts as a natural buffer. Buffers are also created using planned fire. Practical problems have been encountered with the burning of narrow buffers in mallee-heath vegetation. In these areas, the almost total lack of a litter layer means that fire will only spread when the wind is above a critical speed. The fire then spreads by consuming the standing bush and this leads to obvious control problems.

In an attempt to overcome this problem, a number of trials of 'scrub rolling' have been conducted. Trials of the technique in autumn 1989 on the perimeter buffer in the eastern half of SRNP were highly successful and enabled burning to be safely and efficiently carried out.

The technique, however, has drawn some public criticism because it is visually unattractive and may uproot plants with rigid, woody stems (such as grass trees and some *Eucalyptus* species). Research results to date indicate that regeneration following scrub-rolling is similar to that following fire and that all species will regenerate. The period between scrub-rolling and subsequent burning should be kept as short as possible, ideally to a few weeks, in order to minimise potential seed losses (McCaw and Smith, 1992). Monitoring of regeneration of scrub-rolled areas is continuing.

Another technique which has been successfully used to put buffers in place in SRNP is the use of wind-driven fires. These fires have been used to break up areas of even aged fuel without the necessity of a defined 'edge'. The technique relies on fires going out of their own accord and thus it is difficult to predict the eventual size of individual burnt patches.

Patch burning from aircraft appears to have considerable potential as a technique for maintaining mosaics of fuel age within SRNP while reducing the reliance on tracks and firebreaks. This technique has been successfully employed in similar vegetation types in the Fitzgerald River National Park and in the Ravensthorpe area.

There is a scarcity of water for fighting fires in the Park, and it is important to develop and maintain an adequate system of strategically located water points.

Porongurup National Park

The karri forest in PNP has suffered severe fire damage caused by escapes from agricultural clearing burns a number of times since the turn of the century. In March 1966, a fire spread from farmland into PNP and burnt for more than two weeks, seriously damaging many mature karri trees.

The dominant vegetation types in PNP are tall open karri forest and open jarrah-marri forest. Granite outcrops contain most of the species endemic to the Range (see 'Vegetation and Flora'). These species are often killed by fire as they have not evolved in the presence of frequent fire.

Much of the area surrounding PNP has been cleared for agriculture and supports a wide range of land uses, all of which require protection from damage by fire. Some areas of PNP have remained unburnt for a considerable period of time and merit continued fire exclusion because of their value as reference areas and for the protection of fire-vulnerable karri regrowth. Fire-killed trees remain starkly obvious for many years and may pose a significant hazard to people in the forest areas.

Consideration has been given to protecting the karri block on the southern side of the Range from the potentially devastating effects of wildfire by carrying

out prescribed burning. However it has been determined that the best strategy to protect both the southern karri block and adjacent private property is not to carry out prescribed burning within the block, but to involve local Bush Fire Brigades, the Shire of Plantagenet, Bush Fire Service and neighbours in an integrated approach to fire management on the southern boundary of the Park. Discussions have begun towards development of a local Fire Prevention Plan. Retaining the 'No Planned Burn' regime for the southern karri block is not without risk, but it is not considered practical to carry out prescribed burning within the block. While this is an area of high hazard, the risk of wildfire is low due to the extremely limited number of days each year on which the karri on the south side of the Range is dry enough to burn.

Karri forest typically has a dense shrub understorey up to 6 metres in height together with a thick layer of leaf litter and twigs on the forest floor. Fuels dry slowly beneath the dense understorey and forest canopy and may not be sufficiently dry to burn until the onset of summer. The period in any summer when forest fuels are dry enough to burn will vary with the exposure to the sun, with north-facing slopes remaining dry much longer than south facing slopes. However, once fuels are dry, fires in karri forest will burn with high intensity and may throw firebrands for many kilometres. High intensity fires in karri forest are difficult to suppress and require considerable mopping-up afterwards to extinguish burning logs and tall dead trees which may have caught alight. Such high intensity fires can kill large karri trees and damage tree crowns.

Jarrah-marri forest typically has an open understorey of shrubs up to two metres tall, and if left unburnt for 15 years or more, fuels accumulate to about 20 to 30 tonnes per hectare (about half the level found in karri forest). Jarrah-marri forest may be dry enough to burn from September to the end of April each year. Fires normally spread via the litter layer on the forest floor except under extreme weather conditions when flames may engulf the entire forest canopy.

Some key research findings of relevance to PNP are:

- Young karri stands must be protected from fire until a substantial proportion of the trees have attained sufficient height (20 metres or more), and stem diameter (15 cm diameter at 1.3 metres above the ground), to enable them to tolerate low intensity fire. Typically this requires a period of fire exclusion of 15 to 20 years following a high intensity fire or other disturbance that has resulted in the establishment of seedlings. Even after this time, the intensity of fire must be kept low to avoid damaging the trees (McCaw, 1986). In the case of PNP, it may take 25 years for karri regrowth to reach sufficient height and stem diameter;

- Fire is an important factor affecting the nutritional stability of jarrah and karri forests. Evidence suggests that both forest types are nutritionally resilient following disturbance, although further work is required to fully understand the effects of regular burning on nitrogen and phosphorus balance (O'Connell and Grove, 1991);

- Fire results in temporary shifts in the species composition and structure of the vegetation, the degree depending on the season and intensity of burning. In jarrah forest, the majority of understorey plant species regenerate from root material which survives the fire, while in karri forest, there is greater reliance on soil-stored seed for regeneration. (Within PNP, those species not well adapted to fire mainly occur on rock outcrops which act as natural fire breaks and only burn under extreme conditions);

- The number of plant species evident at a site is generally greatest between two and five years after fire and tends to decline with time since fire. Some species may temporarily disappear until the site is burnt again, although they remain in the form of seeds.

In the predominantly forest fuels in PNP the risk of re-ignition is greater than in shrub vegetation types and fuel-reduced areas need to be sufficiently extensive to contain the spread of spot fires under severe burning conditions. Planned fires therefore need to be contained within well defined boundaries and a substantial proportion of each fire management unit designated for burning must be burnt.

GENERAL STRATEGIES

To achieve the objectives set for fire management in the Parks, three major fire strategies, 'No Planned Fire', 'Vegetation, Habitat and Fuel Management' and 'Fuel Reduction', are proposed. These are shown in Figures 8 and 9 and described in Table 4.

No Planned Fire

- **Efforts will be made to exclude fire from some areas for the life of this Plan to enable vegetation to mature.**
- **Representative areas of major vegetation types will be protected from fire as far as is practicable during the life of the Plan for retention as biological reference areas. This involves not only a policy of no planned fire but also entails protection of those areas by fuel reduction on their perimeters and reasonable efforts to suppress wildfires should they occur in these areas. Replacement areas will, where feasible, be sought for any reference areas which are burnt in wildfires during the life of this Plan.**

Vegetation, Habitat and Fuel Management

- **Planned fire will be applied in some areas at different times throughout the life of this Plan in order to manage vegetation and habitat by creating a mosaic of different fuel ages and habitat types and to provide an element of fire protection. The target is to have between 20 and 60 percent of the vegetation cover in each of these fire management units burnt under prescribed conditions during the life of this Plan. To the greatest extent practicable, the cumulative total burnt should be achieved in successive burns throughout the life of the Plan to maximise the diversity of vegetation ages in each fire management unit. Each Vegetation, Habitat and Fuel Management area will be reviewed annually in the light of any additional scientific knowledge to determine whether or not it should be burnt for ecological or protection purposes.**

Fuel Reduction

- **Fuel reduced areas will be maintained on most Park boundaries. The target is to have between 50 and 80 percent of the vegetation cover in each of these fire management units burnt under prescribed conditions in any fire. The rotation period between burns will vary depending on the rate of fuel accumulation within vegetation types with the possibility that some areas may require a second prescribed burn in the life of this Plan.**

SPECIFIC STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

Liaison

1. **Maintain close liaison and mutual aid arrangements with local Bush Fire Brigades, Park neighbours, Local Authorities and other agencies through the establishment and maintenance of local Fire Prevention Plans.**

2. **Encourage the active involvement of local Bush Fire Brigades, Local Authorities, neighbours and the Bush Fire Service in all aspects of fire management in the Parks and consider the establishment of a fire advisory group which includes representatives of these interests.**

3. ***Develop neighbour and public knowledge about community fire protection needs and Departmental fire management objectives and response procedures.***

4. **Implement programs to inform and educate visitors regarding fire management in the Parks, and fire safety and survival.**

Use of Planned Fire

5. **Prepare and implement a fire Master Plan from which annual fire management programs will be developed. Present annual fire management programs for endorsement at the relevant Local Authority Bush Fire Advisory Meetings.**

6. **Continue to apply standard Departmental requirements for an approved prescription prior to initiating planned fire. The**

prescription should take particular account of environmental values, especially the need for *Phytophthora* dieback control and landscape management.

7. ***Reduce fuels using planned fire and where necessary, using techniques such as slashing and scrub rolling, in carefully selected strategic buffer areas either within the Parks, or where agreed with neighbours, on adjacent lands.***

8. **Reduce the degree of reliance on perimeter buffers over the life of this Plan by the progressive creation of mosaics of different vegetation ages within the Parks.**

9. **Continue to develop the technique of aerial ignition to create mosaics of differing vegetation age using patch burns and wind-driven fire.**

INSERT FIGURE 8

INSERT FIGURE 9

Table 4.

MAJOR FIRE STRATEGIES (1999)

(Note: The application of these fire management strategies will require review in the event of any major wildfires)

FIRE STRATEGY	USE IN SRNP	USE IN PNP
No Planned Fire Areas	An area near the southern boundary on the east side of Chester Pass Road and in the vicinity of the salt lakes on the south-east corner of the Park, both of which have been maintained as fire-free reference areas for a number of years. It is also proposed to maintain the areas around Mondurup Peak and the area of Mt Magog / Talyuberlup Peak / Henton Peak / Barnett Peak as reference areas. The areas around Mt Trio and near the southern boundary to the west of Chester Pass Road which were burnt during wildfires in 1996 will also be protected from fire for the life of this Plan.	The granite peaks of the range will be protected from fire to the greatest extent possible. As no firebreaks can be constructed, however, fire may unavoidably reach some of the granite areas. Areas of karri regrowth on the main range will also be protected from fire for the life of this Plan to allow the vegetation to mature.
Vegetation, Habitat and Fuel Management Areas	To the north and south of Stirling Range Drive, excluding the no planned fire areas around Mondurup Peak, Mt Trio and north of Stirling Range Drive. In much of the east of the Park and in the areas around Mt Hassell, Toolbrunup Peak and in the south of the Park west of Chester Pass Road to establish a mosaic of vegetation ages in the areas burnt in 1991 and 1996 respectively. Also in the Hamilla Hills block and the area to the north west of Red Gum Pass Road.	The bulk of the Park to create a mosaic of fuel ages in order to break up fuels and prevent a major wildfire from burning the entire northern side in one run.
Fuel Reduced Areas	Along southern boundary to separate the Park from adjoining agricultural land to reduce the risk of a fire burning from the Park under a hot northerly wind. Also the boundary of the area to the north-west of Red Gum Pass Road and boundary buffers and one larger area along the northern boundary west of Chester Pass Road to limit the potential run of any wildfires. Strips either side of Chester Pass Road and along the northern boundary are also to be fuel reduced.	Southern boundary of the Park immediately east of Wansbrough Road to separate the Park from the Mira Flores Estate and between Woodlands and Wansbrough Roads. Also along the northern and south-eastern boundaries of the Park.

10. **Consider the range of weather conditions likely to be encountered when planning and implementing fire management activities, whether for planned fires or wildfires (see also 'Climate').**

Wildfire Preparedness

11. **Maintain to a suitable standard a system of strategic firebreaks for fire and other management access, closed to public motor vehicles and subject to dieback hygiene requirements for any management use. This may include limited relocation of some existing tracks (see also 'Management Access').**

12. ***Maintain an efficient fire detection system and effective fire fighting forces and equipment within the resources available.***

13. **Consider the use of spotter aircraft to detect fires during periods of very high or extreme fire danger.**

14. **Establish and maintain an adequate system of strategically located water points in liaison with local Bush Fire advisory committees.**

15. ***Maintain fire emergency response plans for the Parks.***

16. **Close parts or all of the Parks to visitors if necessary during periods of very high or extreme fire danger, or in the event of a serious wildfire in or threatening either Park. This may include evacuation of Park users (see 'Visitor Safety').**

Wildfire Suppression

17. **Endeavour to contain wildfires that enter or start in the Parks within a fire management unit defined by the strategic access tracks indicated in Figures 8 and 9. Suppression strategies may involve allowing the fire to burn out to low fuel areas, back burning from existing tracks or direct attack including the use of heavy equipment if essential. Choice of techniques will depend on values at risk, dieback disease risk, fire behaviour, resources available and presence of buffers and tracks.**

18. **Construct any emergency firebreaks subject to strict dieback disease hygiene principles using minimum impact techniques. Rehabilitate as soon as practicable after completion of fire suppression operations.**

Management for Conservation

19. ***Consistent with the requirement to protect life, property and nature conservation values, use planned fire to provide and maintain biological diversity.***

20. **Conduct planned fire operations subject to strict dieback disease hygiene principles.**

21. ***Use fire to develop or favour habitat for specific flora, fauna and ecological communities where appropriate.***

22. **Use planned fire over a range of seasonal conditions to help create and maintain diversity and to provide opportunities for research and monitoring, where practical.**

23. **Modify, relocate or defer burns where there are known threatened flora, fauna or ecological communities within proposed burn areas. Where a threatened species is known to be fire-dependent, or it is essential for protection purposes for burning to occur, seek Ministerial permission to 'take'[1] threatened flora before conducting a burn.**

24. **Close and rehabilitate all firebreaks which are not essential to the implementation of this Plan.**

Management for Recreation

25. **Protect facilities from fire where possible, by careful site design and management, fuel reduction and other appropriate methods.**

26. **Provide gas barbecues at selected day use areas.**

[1] 'To take' in relation to any flora is defined under the Wildlife Conservation Act as including 'to gather, pluck, cut, pull up, destroy, dig up, remove or injure the flora'.

27. Continue to prohibit campfires for camping and cooking.

28. Allow the use of portable stoves (except on days of very high or extreme fire danger) where gas barbecues are not provided.

29. Allow the use of fire for ceremonial and other special approved purposes, subject to the issue of a written permit.

Research and Monitoring

30. Record and analyse details of all fires, including fire behaviour information.

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

32. Review the management of fire after any major wildfire in either Park.

33. Conduct research into the pre-European fire histories of the Parks and incorporate relevant findings into fire management practices.

34. Encourage research into local weather conditions which may have an influence on fire behaviour in the Parks including through the use of automatic weather monitoring equipment (see also 'Climate').

35. *Assist with research into fire behaviour and fire ecology.*

PLANT DISEASE

The objectives are to:

- *Prevent as far as practicable, the introduction of dieback fungus and other plant pathogens into disease-free areas.*
- *Minimise spread of the dieback fungus and other plant pathogens where they are already present.*
- *Minimise, where practicable, the risk of plant disease intensification.*
- *Protect populations of threatened flora and threatened ecological communities from plant disease.*
- *Increase knowledge of the impacts and control of plant disease.*

Three plant diseases have been identified in SRNP and PNP following intensive surveys since 1986. The best known of these is *Phytophthora cinnamomi* (commonly referred to as dieback disease). *Armillaria luteobubalina* and canker fungi are also known from the Parks.

PHYTOPHTHORA CINNAMOMI

P. cinnamomi, an introduced fungus of tropical origin, is transported in infected soil on earth moving machinery, the tyres of vehicles, the boots of walkers and in some cases the feet of native animals. It spreads with the movement of water through the soil and in overland flow, being particularly active in warm, moist conditions.

Conditions in the Stirling Range in particular have generally been very conducive to the survival and activity of this fungus. These conditions include a species rich, susceptible flora and an average rainfall of 500-600mm, including heavy unseasonal falls in warm summer months. Mountain peaks can attract heavier falls and also regular light rain throughout the year. Soils susceptible to waterlogging are common within the Park increasing the susceptibility of sites to dieback disease.

The Porongurup Range also experiences a high rainfall but contains species of flora which are generally much less susceptible to dieback. *P. cinnamomi* is of major concern in small areas of PNP which have concentrations of susceptible flora.

Stirling Range National Park

The approximate area of SRNP affected by the soil borne fungus *P. cinnamomi* is shown in Figure 10. The obvious extent and impact of the disease in the Park prompted an intensive program of mapping in 1992-93 to determine those areas of the Park remaining apparently dieback free.

Because of the broad scale nature of the mapping base used, there will inevitably be pockets of uninfected vegetation within areas marked as dieback affected and conversely, minor infections may occur in areas shown

as dieback free. However, this does not change the overall picture of dieback distribution in the Park.

Closure of unnecessary tracks will assist with dieback disease management.

The impact of dieback disease on the plant communities in the Park is quite dramatic, resulting in changed vegetation floristics and structure. This has significant implications for some plant species and for the fauna reliant on them for food and shelter (Wills 1993).

There appears to be a strong correlation between the higher, more significant and readily accessible peaks and the distribution of the fungus.

In order to minimise the risk of infected soil being moved into dieback disease free areas, access restrictions were introduced in the Park in 1994. Disease free areas, contained within the proposed 'Special Conservation' Zone are closed to vehicles and walkers except those in possession of an access permit (see Figure 4). Permits are only issued during dry soil conditions when the risk of soil adhering to walker's boots is minimal. The access restrictions have been well respected by Park users and it is proposed to continue this system. The Mondurup Peak path, which is within the Special Conservation Zone, will be closed, due to the Peak's very significant environmental values. However, permits may still be considered for access for scientific and management purposes only to Mondurup Peak during dry soil conditions.

Other management techniques used to minimise the impacts of dieback disease are discussed in Gillen and Watson (1993). Dieback disease management is also addressed in the South Coast Region's Path Management Plan (1990).

SRNP contains a number of threatened and priority listed plant species and threatened ecological communities, most of which are susceptible to dieback disease. *P. cinnamomi* is known to be seriously affecting a number of these populations. Populations of threatened and priority listed plant species and threatened ecological communities (see 'Flora of Special Interest') are currently being treated with 'phosphite' spray which increases the resistance of plants to the effects of the disease.

Porongurup National Park

Despite a lengthy history of disturbance including both logging and grazing, the Porongurup Range has been impacted by *P. cinnamomi* only to a limited extent as shown in Figure 11. Dieback is present but is limited in its apparent distribution to the jarrah/marri forest on the lower slopes of the Range. There is no dieback disease expression evident in the karri forest areas. There is a limited number of indicator species present in this vegetation and although the pathogen could be present, no symptoms are evident. Dieback disease has had a much more significant impact on the low jarrah/banksia association on the Woodlands Block to the west of Woodlands Road which has a high number of susceptible species present in the community.

CANKER

Several aerially dispersed canker-causing fungi are found throughout the Parks. These are notably *Botryosphaeria ribis* and *Cryptodiaporthe melanocraspeda*. These fungi have caused the decline of some plant species such as *Banksia coccinea* in SRNP but are not considered a major threat to the Parks at present.

Research on control of *C. melanocraspeda* on *B. coccinea* is currently being conducted in SRNP as part of a larger research program.

ARMILLARIA

Armillaria luteobubalina, a native fungus which attacks a wide range of plant species is also present in the Parks. It is known to be having a major impact on wandoo plant communities in several areas of SRNP. The fungus is widespread in PNP and appears particularly associated with mature karri trees killed by a fire in 1971. Management for this fungus is similar to that for *Phytophthora* dieback.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. ***Prevent, as far as practicable, the establishment of dieback disease in new areas and minimise***

additional spread in areas where the disease already occurs by controlling access and operations in susceptible areas.

2. **Undertake dieback disease management in accordance with the current Albany District Dieback Protection Plan.**

3. ***Assess all operations and uses with an evaluation test for potential dieback disease impact and consequences.***

4. ***Identify priority areas within the Parks for protection from dieback disease based on conservation values, risk of introduction and predicted impact.***

5. **Undertake management actions, such as the application of 'phosphite', to protect threatened or priority listed flora and threatened ecological communities which are being affected by dieback disease as outlined in the Albany District Threatened Flora Management Program and other relevant recovery plans and guidelines.**
6. **Improve, where possible, pedestrian and vehicle access to minimise the risk of infected soil being picked up and spread.**

7. **Implement the zoning proposals in the plan which seek to protect areas from the introduction of the *Phytophthora* pathogen (see 'Zoning' and Figures 4 and 5).**

8. **Gazette the 'Special Conservation' Zone as a plant disease management area under Section 62(1)(f) of the CALM Act (see 'Zoning').**

9. **Implement access restrictions in areas which are at risk from plant disease introduction by any activities in the Parks.**

10. ***Improve understanding by the public and by CALM personnel of the dieback disease problem and protection measures in the Parks.***

11. **Provide information to support access restrictions in order to raise general public awareness and understanding of management actions.**

12. **Continue to ensure that staff associated with the Parks are comprehensively trained in dieback disease recognition, sampling and management.**

13. ***Undertake dieback disease mapping and assist with dieback research.***

INSERT FIGURES 10 and 11

14. **Encourage research to be conducted on the susceptibility of threatened and priority listed flora species and threatened ecological communities to dieback disease, implementing any strategies that can be practically developed to protect such species and communities through the Albany District Threatened Flora Management Program and other relevant recovery plans and guidelines.**

15. **Encourage research into the effective management of areas affected by plant disease (see also 'Rehabilitation').**

16. **Continue to ensure that all CALM staff and visiting scientists working in the Parks follow dieback disease hygiene procedures.**

17. **Review management prescriptions in the light of any new research findings on the introduction, spread, impact or control of plant diseases in the Parks.**

18. ***Develop and adopt appropriate strategies for other plant diseases including other* Phytophthora *species,* Armillaria *and canker.***

INTRODUCED PLANTS

The objective is to control and if possible eradicate weeds with the potential to cause significant environmental degradation, using methods which minimise impacts on native species and natural processes.

Weed species may compete with, and eventually replace native flora, and can have a significant adverse impact on conservation values. Weeds most commonly become established in areas of disturbance, and care must be taken to ensure weed hygiene during management activities. The potential for weed invasion must also be assessed in all fire management operations. Control methods must be chosen to ensure minimal impact on native species and natural processes, as well as safety for Park visitors and staff.

Stirling Range National Park

Weeds in SRNP are not as big a management problem as in PNP although a total of 93 species has been recorded in the Park. They are largely confined to road verges, amenity areas and some drainage lines. Control of weeds entering the Park along roads and boundaries is the major requirement.

Porongurup National Park

Weeds are a major management problem in PNP with 113 weed species having been identified in the Park (Keighery, 1998). In addition there are species such as fruit trees which are persisting in the area known as the Old Farm. Factors such as the Park's convoluted boundaries, relatively good soils, past history of grazing, clearing on the Range and incorporation of farm land to expand the Park have led to the wide distribution of weed species.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. **Develop and implement a specific weed control program for PNP which:**
   - **Identifies priority species and localities based on degree of infestation, invasive potential, size of infestation and ease of control;**
   - **Determines optimum control strategies;**
   - **Specifies rehabilitation requirements;**
   - **Involves the local community.**

2. **Maintain an inventory of declared and non-declared weeds in the Parks and regularly monitor their distribution.**

3. ***In conjunction with Agriculture Western Australia and adjacent landholders, develop programs to control declared weeds.***

4. **Develop and implement appropriate control programs for non-declared weeds.**

5. ***Maintain liaison with neighbours to optimise control of boundary weed infestations.***

6. ***Assess the efficiency of control on target species and any effects on non-target species and make changes to procedures if required.***

FERAL ANIMALS

The objective is to control feral animals using methods which have minimal impact on native flora and fauna and natural processes.

Both the Porongurup and SRNP have feral animals within their boundaries. Feral animals act either as competitors or predators to the native fauna in the Parks. They may also cause the alteration of habitats.

The Australian fauna has evolved in the absence of many of the predators now present in large numbers. In the Stirling and Porongurup Ranges, the most significant feral predators are the fox *(Vulpes vulpes),* the feral cat *(Felis catus)* and the domestic dog (*Canis familiaris).* These animals are believed to be the most important factor in the decline and disappearance of animals such as the numbat, tammar wallaby and ringtail possum from areas like the Stirling and Porongurup Ranges (Cribb, 1987).

Both Parks are covered by the Department's 'Western Shield' program. This involves the aerial baiting of the conservation estate four times each year in order to control foxes over a broad area of south-west WA and the reintroduction of some fauna species which have become locally extinct. The program is executed in liaison with LCDCs.

No systematic programs have been instigated to eradicate feral cats or dogs in the Parks. Cats are trapped around recreation sites and ranger facilities and if sighted by rangers, they are shot.

Feral herbivores also occur in both Parks. The most significant of these pests are the European rabbit (*Oryctolagus cuniculus),* house mouse *(Mus musculus)* and the black rat *(Rattus rattus).* Feral herbivores have not been considered a significant problem in the Stirling Range or Porongurup National Parks, however CALM has been involved in rabbit control programs on the northern boundary of SRNP and the adjacent nature reserves. Rabbit numbers are controlled by Agriculture Western Australia programs.

Unconfirmed reports have also been received suggesting that feral goats and pigs may exist in the area of the two Parks. This situation requires careful monitoring.

Feral bees occur in both Parks although no attempts have been made to control them. There are no significant insect pests known in either Park at present (1999).

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. ***Maintain an inventory of feral animals and pests in the Parks.***

2. ***In conjunction with Agriculture Western Australia, LCDCs and adjacent landholders, develop programs to control feral animals.***

3. ***Carry out monitoring and control programs on feral animals.***

4. ***Assess the efficiency of control on target species and any effects on non-target species and make changes to procedures if required.***

REHABILITATION

The objective is to restore degraded areas of the two Parks to a stable condition resembling the natural environment as closely as possible.

Numerous degraded areas in both Parks are in need of rehabilitation. In mountain areas in particular, bare earth can erode quickly as well as lead to an increase in runoff into adjacent lands.

Once an area has been disturbed, for example by gravel extraction, it is necessary to rip and reform the surface and then to re-establish native vegetation. This must be done using seed collected in the immediate vicinity to preserve the genetic integrity of the species in the area. Extreme care is required in the rehabilitation of areas which are affected by or susceptible to plant disease to minimise the risks of spread or intensification. The use of disease-resistant

species should be considered in areas which are already infected.

In cases where other agencies have been responsible for the disturbance of areas within the Parks, it is the Department's policy that the agency is responsible for rehabilitation of the areas to a suitable standard. This must include the eradication of weeds (see 'Introduced Plants'). Main Roads WA may require continuing access to gravel resources within the Park for the maintenance of Chester Pass Road.

The opportunity exists to create a helipad within SRNP at a site such as an existing disused gravel pit. This would need to be considered in the development and implementation of the rehabilitation program for the Park (see 'Visitor Safety' and 'Military and Other Training').

Stirling Range National Park

Specific areas in need of rehabilitation are:

- Disused gravel pits along Chester Pass Road, Stirling Range Drive, Salt River Road, Formby South Road and Bluff Knoll Road;
- Closed sections of roadway and paths where realignments have taken place;
- Sections of paths which are duplicated unnecessarily;
- Unnecessary firebreaks;
- Disused recreation areas;
- Areas severely affected by dieback disease;
- Cutting embankments, particularly on the Bluff Knoll Road and the Scenic Drive; and
- Degraded areas around some recreation sites.

Porongurup National Park

Specific areas in need of rehabilitation are:

- Extensive areas from which weeds are to be removed including the area of the north side of the Range which has been overgrown by Silky Wattle;
- Some areas of degraded karri;
- Parts of the Old Farm;
- Disused gravel pits;
- Closed sections of roadway and paths where realignments have taken place; and
- Degraded areas around some recreation sites.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. **Develop and implement rehabilitation programs for each Park which:**
   - **Identify degraded areas in need of rehabilitation;**
   - **Establish priorities for rehabilitation;**
   - **Specify rehabilitation prescriptions for each priority area;**
   - **Provide for monitoring of rehabilitated areas and follow up action if required.**

2. **Rehabilitate any emergency access as soon as practicable after completion of operations.**

3. ***Where rehabilitation is the responsibility of another agency (e.g. after gravel extraction), establish a schedule of conditions between that agency and CALM before approvals are granted.***

4. **Encourage research into the effective management of areas affected by plant disease (see 'Plant Disease').**

ABORIGINAL HISTORY AND CULTURAL RESOURCES

The objectives are to:

- *Identify and protect Aboriginal sites within the Parks.*
- *Provide for contemporary use for Aboriginal cultural activities.*
- *Increase the awareness of Park visitors of the history of use of the areas by Aboriginal people and their significance.*

Aboriginal people have occupied areas in the vicinity of the Stirling and Porongurup Ranges for thousands of years (Leighton, 1993; Bates, 1992). Both ranges appear to have been traditionally regarded as highly significant places, a view which is still held by Noongar people today. Stirling Range was known as 'Koikyennuruff' by the local Aboriginal people as was sketched on the first map of the area by Ensign R Dale. 'Koikyennuruff' has been interpreted as referring to the way the mist moves about on the Range (Von Brandenstein, pers. comm.). While Porongurup is derived from an Aboriginal word, which appears to

have been 'Borong-gurup' (Bates, 1992), there is some uncertainty as to its meaning.

A number of features in the Parks are known to have both European and Aboriginal names. Examples (from Williams, 1993) are:

- Bluff Knoll - Bullah Meual; and
- Mt Trio – Warranup.

Several archaeological sites have been identified in and around SRNP (Corsini, pers. comm.). Neither the Stirling nor Porongurup Ranges appear to have been the subject of a systematic Aboriginal sites survey to date.

The Stirling and Porongurup Ranges figure highly in local Aboriginal beliefs. Both areas are known for the presence of spirits. Stories about the formation of the mountains and about mythological beings are still being passed from generation to generation in the Noongar community (Kelly, 1993; Watt, 1994). The Stirling Range is also regarded as an important location for the regeneration of spiritual power (Williams, 1993).

Noongar people are keen to maintain their traditional ties with the land and in particular to ensure that their culture is transferred to future generations. Access to bush areas for the conduct of cultural activities is an important element in the maintenance of this living culture (CALM, 1991). Cultural activities can include camping, hunting, gathering and the holding of ceremonies. To facilitate ceremonies, fire may need to be allowed under special permits.

To address the legitimate safety and conservation concerns of the community, hunting with firearms is not allowed in the Parks (see 'Visitor Safety').

Currently, groups of school children are being taken into the Parks for exposure to Noongar traditions and culture. These activities include the harvesting of limited amounts of traditional food and medicinal plants.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. **Consider progressively changing the names of features such as peaks to their Aboriginal names and promote the use of these names (see also 'European History and Cultural Resources').**

2. ***Ensure that activities in the Parks do not impact detrimentally upon known Aboriginal sites.***

3. **Seek to conduct ethnographic/ archaeological surveys in any areas of the Parks which will be disturbed by new development proposals.**

4. ***Train staff, in liaison with the Aboriginal Affairs Department, in the recognition of sites and report any new sites to them so that registers can be updated.***

5. ***Develop and implement management guidelines for Aboriginal sites in the Parks in liaison with the Aboriginal Affairs Department, WA Museum, tertiary institutions and Aboriginal organisations.***

6. **Continue to liaise with the local Aboriginal community on the significance of the Parks to Aboriginal people and on Aboriginal land use interests.**

7. ***Liaise with Aboriginal groups concerning requests for access to the Parks for traditional cultural activities. Where fire is required for ceremonies, a written permit must be obtained* (see "Fire"). *Negotiate access in accordance with Departmental policies.***

8. **Incorporate interpretive information on Aboriginal culture in the visitor centre proposed for SRNP and consider giving the centre an appropriate Aboriginal name (see also 'Information, Interpretation and Education').**

9. ***Where appropriate, incorporate material on Aboriginal culture in other interpretive displays and community education programs.***

EUROPEAN HISTORY AND CULTURAL RESOURCES

The objective is to recognise the historical significance

of the Parks, protect their European cultural resources and provide information on their European history.

Being obvious features on the inland horizon, both the Stirling and Porongurup Ranges were documented from the early days of European exploration and settlement of the area of King George Sound.

Stirling Range

The first European record of the Stirling Ranges was made by Matthew Flinders aboard the 'Investigator' in 1802. In 1827, a settlement was established at King George Sound (now Albany) and early pioneers in search of land and resources made expeditions inland to the mountains.

The range, known as 'Koikyennuruff' by the Aboriginal people (see 'Aboriginal History and Cultural Resources'), was named the Stirling Range by surveyor John Septimus Roe in 1835 in honour of the Governor of the Swan River colony, Sir James Stirling, although the Governor never actually visited the mountains. In 1848 the Government promoted the export of sandalwood from Fremantle and the tiny southern port of Cape Riche. One of the early sandalwood cutters' tracks became Chester Pass Road.

In 1913 the Stirling Range was gazetted as a national park, one of the earliest in WA. By the 1920s a Stirling Range Tourist Association had formed and fostered the construction of roads to allow access into the area (Sandiford, 1988).

Land settlement began in the area around the Range in the late 1800s (near Amelup) and eventually, only the National Park itself remained uncleared. The first Park ranger was appointed in 1964.

Historical sites within the Park include:

- Ruins near Kojaneerup Spring;
- Old stock route in the south of the Park; and
- Site of a corral near Moingup Spring.

Porongurup Range

The Aboriginal name for the Range appears to have been 'Borong-gurup' (Bates, 1992) and this has been essentially retained.

The Range attracted the attention of early European settlers at King George Sound because of the richer green foliage of the karri contrasting with the surrounding country. The first pastoral lease to include the Range was taken out by John McKail in 1859. Logging of karri and jarrah commenced early this century and the Porongurup area once supported several timber mills. The Bolganup Homestead and Karribank (built by Hugh Faulkner in 1910) were opened as guest houses in the 1920s.

The Porongurup Range was gazetted as a national park in 1925. During the 1920s and 1930s potatoes, boronia blossom and possum furs were all sold to supplement the income of local residents. A previous farm on the north side of the range is still highly visible today and requires some rehabilitation. Ruins of the old homestead are located at the lower edge of the clearing. By the 1930s PNP was a leading tourist destination although the first resident ranger was not appointed until 1976.

Historical sites within the Park include:

- The Old Farm;
- Waddy's Hut; and
- Ruins of the old Mira Flores homestead.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. **Consider progressively changing the names of features such as peaks to their Aboriginal names and promote the use of these names (see 'Aboriginal History and Cultural Resources').**

2. **Establish and maintain a register of historic sites.**

3. ***Develop and implement management guidelines for any historic sites in liaison with the WA Museum, National Trust, Heritage Commission, tertiary institutions and historical societies.***

4. **Implement a plan of management for the area of the Old Farm which recognises its historical significance and recreational values. This may include some revegetation of the cleared area.**

5. **Encourage research into the origin and correct spelling of historical names in the Parks.**

6. **Incorporate material on European history and culture in interpretive information and community education programs.**

7. ***Maintain liaison with local historical societies.***

RECREATION AND TOURISM

ATTRACTIONS AND EXISTING USE

The objective is to provide a range of outdoor recreation opportunities in the two Parks in a manner which recognises their shared and differing attributes and is consistent with the need to ensure conservation of the Parks' natural and cultural resources.

Both SRNP and PNP are popular destinations for visitors from the local area and from much further afield. Visitor numbers were estimated at 90 000 to SRNP in 1997-98 and 43,000 to PNP. These figures, however, do not take into account those visitors who simply drive past the Parks enjoying their scenic attractions. Such visits would add significantly to the estimates above.

Peak visitor levels generally occur in both Parks during school holidays and at long weekends.

The Parks offer a range of outdoor recreation opportunities and are particularly well known as destinations for nature observation, bushwalking and rock climbing. SRNP offers significant 'back country' mountain recreation opportunities.

Two surveys of visitors to the Parks have been conducted in recent years. A survey conducted over Easter 1991 found that of 779 different vehicles:
- 46% were observed only in SRNP;
- 46% were observed only in PNP; and
- 8% were observed in both Parks.

The most popular sites were Bluff Knoll with 53% of visitors to SRNP observed there, and Tree in the Rock with 79% of visitors to PNP observed there.

A high proportion of visitors were observed at only one site over the five days of the survey. Of visitors to SRNP, 34% were observed only at Bluff Knoll, while in PNP, 62% of visitors were observed only at Tree in the Rock. This latter figure has clear implications for site overcrowding with the number of vehicles at the site reaching a peak of 58 at lunchtime on Easter Monday 1991.

STRATEGIES

1. **Provide for a range of recreation opportunities in the two Parks consistent with the zoning scheme detailed in 'Zoning'.**

2. **Separate incompatible Park uses where possible (see 'Zoning')**.

3. **Assess requests for use of the Park for new recreational pursuits considering the following:**
   - **Appropriateness in a national park;**
   - **Appropriateness in the regional context;**
   - **Compatibility with existing uses;**
   - **Likely environmental impact;**
   - **Availability of alternative opportunities;**
   - **Management capability;**
   - **Risks to visitor safety;**
   - **Appropriateness in relation to the Parks' cultural history.**

4. **Conduct research to ascertain visitor use numbers, patterns, preferences and perceptions and to assess levels of satisfaction with Park management.**

VISITOR ACCESS

The objective is to facilitate the enjoyment and appreciation of the Parks through the provision of access which is compatible with other Park objectives and which enables a range of activities to be safely undertaken by visitors with varying abilities.

The provision of safe access which serves the needs of Park visitors while having minimal impact on Park values is a fundamental management issue. On the basis of their existing or potential impacts, some access requests need to be excluded from certain zones (see 'Zoning') and others cannot be accommodated in these Parks at all.

Site durability is an essential consideration in planning for access in the Parks. Granite outcrops and fast growing vegetation in many parts of PNP lead to greater site durability than SRNP with its shallow soils and fragile vegetation.

Proposed visitor access is shown in Figures 12 and 13.

ACCESS FOR WALKERS

Bushwalking has been a popular activity in both Parks for many years.

There are many paths provided within both Parks and in addition, opportunities for 'walking off the beaten track' are numerous. Bushwalking has generally been regarded as a low impact activity, however, even low numbers of walkers can cause detrimental impacts in some areas, especially in SRNP. The more popular paths to the peaks require constant maintenance. Unfortunately, walkers also have the capacity to contribute to the spread of dieback disease through the adherence of infected soil to footwear, particularly in SRNP. Access restrictions were introduced in the Park in mid-1994 to help protect largely uninfected areas (see 'Plant Disease').

Paths in the two Parks are managed under the South Coast Region Path Management Plan (CALM, 1990), which addresses the full range of path management issues, including the management of dieback disease.

CALM recognises three main categories of path. These are:

- Walk - A relatively short, well-formed path with a stable walking surface constructed to 'shoe' standard. Walks require limited skill or experience to negotiate and are suitable for persons of all ages and fitness levels.
- Track - A path constructed to 'boot' standard which requires some skill or experience to comfortably negotiate. Tracks are generally well designed and clearly marked and suitable for persons of at least average physical fitness.
- Route - A lightly marked path or unmarked route for use by well-equipped and experienced hikers only. The only construction is for environmental protection purposes.

Bushwalkers are required to carry their own portable stoves for cooking in both Parks (although these cannot be used on days of very high or extreme fire danger). Open fires are prohibited in both the Parks, due to the risk of wildfire and also because firewood collection causes damage to native vegetation. It is also essential for walkers to carry adequate water at all times.

Severe winter storms which bring snow, sleet and hail may endanger bushwalkers who are not adequately prepared for such conditions. At any time of the year, drizzle and low cloud may reduce visibility on the taller peaks and make navigation difficult in either Park.

Stirling Range National Park

Paths are provided to the summits of the following peaks (approximate return distances and walking times are also shown):

Bluff Knoll	6 kilometres	3 hours
Toolbrunup	4 kilometres	3 hours
Talyuberlup	2.5 kilometres	2 hours
Mt Hassell	3 kilometres	2 hours
Mt Trio	3 kilometres	2 hours
Magog	6 kilometres	4 hours

The path to Toll Peak has been closed for a number of years due to concerns about the spread of dieback disease. Mondurup Peak has extremely high conservation values. The upper slopes are dieback free and a detailed study has recommended that the path be closed to prevent infection of this currently uninfected site (Barrett, 1996). Although Mondurup is in the Special Conservation Zone, permits will be granted for research and essential management purposes only, under dry soil conditions. A path from the bottom of the Bluff Knoll path to waterfalls on a nearby stream was popular, but was closed in 1991 due to degradation on the bank of the stream at its destination. The stream banks at this point are home to rare trapdoor spiders which are survivors from Gondwanan times (see 'Fauna of Special Interest').

Walks on management access tracks and in the vicinity of the Bluff Knoll Road turn-off (e.g. Paper Collar trail) currently provide the only lowland walking opportunities in the Park.

The most popular walks in SRNP other than those on the constructed paths are probably those between Ellen Peak and Bluff Knoll. Some degradation has occurred at preferred stopping places or bivouac sites, especially on the Arrows, and multiple paths exist in some stretches.

Porongurup National Park

Paths are provided to the summits of the following peaks (approximate return distances and walking times are also shown):

Devil's Slide	2.5 kilometres	3 hours
Nancy Peak/ Morgan's View/ Hayward Peak	5 kilometres	3 hours
Castle Rock	1.5 kilometres	2 hours

The path to the 'Tree in the Rock' from the picnic area is the most popular walk in the Park and there is also a short heritage trail from this point. Wansbrough Walk and Millinup Pass are also popular with walkers as they are closed to vehicles.

Serious bushwalkers also frequent the more remote peaks in the Park, although the small size of the Park places limits on extended bushwalking opportunities.

ACCESS FOR VEHICLES

Vehicle access is a vital component of most recreational pursuits in the two Parks. All public roads in the Parks are accessible to 2WD vehicles and are surfaced with bitumen or gravel. Maintenance of gravel roads, although essential for visitor safety, is expensive and some roads may need to be considered for bituminising during the life of this Plan to reduce the ongoing costs of road maintenance and the requirement for gravel. Bituminising may also be required to control the spread of plant disease.

ACCESS FOR HORSE RIDERS

Horses have the capacity to cause erosion problems, particularly due to the steep terrain of these two Parks. They also have the potential to spread dieback disease, especially in SRNP, by picking up infected soil in their hooves. This is of particular concern because of the ease with which horses can move off established roads and trails. Horse droppings and feed can introduce weeds into natural areas and impact on the 'wilderness experience' of other users. If not controlled horses will also browse native vegetation. Safety issues must also be considered. Horse riders and people in vehicles can both be endangered if uncontrolled access on roads is permitted. Horses can also pose a threat to walkers on narrow tracks.

Under road traffic regulations, horses are permitted on public roads in the Parks.

ACCESS FOR CYCLISTS

Cyclists are welcome on all public roads in the two Parks. Mountain bikes have the potential to spread dieback disease through the adherence of infected soil to tyres, particularly in SRNP. In addition, high levels of use could lead to track erosion problems in steep terrain although careful selection of tracks and management of the activity should lessen the potential for negative impacts. Some people whose disabilities preclude bushwalking are able to ride bicycles, particularly in flatter areas.

ACCESS FOR VISITORS WITH DISABILITIES

Careful design of access and facilities is essential to enable visitors with disabilities to have safe and enjoyable experiences in natural settings. In particular the steep terrain of the Parks poses special challenges for access by visitors with disabilities.

At suitable sites, carparks, paths and facilities can be designed and constructed to facilitate their use by visitors with physical or mental disabilities, including those in wheelchairs and those who are visually impaired.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

GENERAL

1. **Permit access only in accordance with the Park zoning schemes (see 'Zoning').**

2. **Ensure that access routes are provided and maintained in a manner which optimises**

landscape appreciation while minimising the potential for erosion and the spread of plant diseases.

3. **Ensure that all forms of access are constructed and maintained to a standard able to safely support current and expected use levels.**

4. **Minimise the impacts of any new access routes using suitable construction techniques.**

5. **Ensure that the conservation and landscape values of the Parks are protected in all access provision and changes.**

6. **Provide information to Park visitors on any access closures necessitated by factors such as fire, erosion damage and rehabilitation operations.**

WALKERS

7. **Provide bushwalking opportunities for users of different abilities and fitness levels as indicated in Tables 5 and 6 including 'loop' walks in lowland areas.**

8. ***Develop and maintain footpaths to appropriate standards to provide safe and enjoyable walking for Park visitors.***

9. **Signpost paths where necessary including safety information and advice to users of the possible closure of paths in circumstances such as extreme fire danger, rehabilitation after fires and dieback disease management.**

10. ***Identify and rank problems on paths in upland areas and prepare and implement works programs to prevent, as far as practicable, the establishment of dieback disease in new areas, minimise the additional spread of dieback disease where it already occurs, arrest erosion and provide safe access.***

11. **Control bushwalking in areas temporarily or permanently closed for reasons such as dieback disease management, protection of threatened species and ecological communities, rehabilitation or impact from fire.**

12. ***Close footpaths which are beyond the scope of known rehabilitation techniques.***

13. **Designate appropriate management access tracks for bushwalking.**

Table 5.
PATHS IN STIRLING RANGE NATIONAL PARK (see Figure 12)

LOCATION	CURRENT STATUS (1999)	PROPOSED STATUS
Bluff Knoll	Track	Track
Bluff Knoll carpark to waterfalls	Closed	Closed
Bluff Knoll lowlands area	None at present	Walk
Eastern Peaks (Ellen, Pyungoorup, Arrows, Isongerup)	Routes	Routes
Toolbrunup	Track/Route	Track (Route for top section)
Moingup Spring	None at present	Walk
Paper Collar	Track	Track
Mt Trio	Track	Track
Mt Hassell	Track	Track
Toll Peak	Closed	Closed
Talyuberlup	Track	Track
Magog	Track	Route
Central Lookout (SR Drive)	Track	Walk (to new lookout)
SR Drive lowlands area	None at present	Walk
Mondurup	Track	Closed
Red Gum Hill	Track	Track
Kojaneerup Spring vicinity	None at present	Walk
Mt James / Success Ridge / East Pillenorup Tracks	Track	Track
Yungermere Crescent	Track	Track
Baby Barnett Hill	Track	Track

Table 6.
PATHS IN PORONGURUP NATIONAL PARK (see Figure 13)

LOCATION	CURRENT STATUS (1999)	PROPOSED STATUS
Tree in the Rock	Walk	Walk
Bolganup Heritage Trail	Walk[1]	Walk
Wansbrough Walk	Walk	Walk
Nancy Peak / Morgan's View / Hayward Peak	Track[1]	Track
Devil's Slide	Track	Track
Millinup Pass	Track	Track
Castle Rock	Track	Track
Scenic Drive area	None at present	Walk

Waddy's Hut area	Track	Walk

1. Interpretive information currently provided.

INSERT FIGURE 12

INSERT FIGURE 13

14. ***Encourage 'low impact' bushwalking and camping.***

15. **Allow back pack camping away from developed areas in the 'Wilderness' and 'Natural Environment' zones (see 'Zoning' and 'Overnight Stays').**

16. **Introduce measures to manage visitor numbers in the 'Wilderness' Zone if required, to maintain the quality of the wilderness experience.**

17. **Provide adequate parking and information at the trail-heads of all major paths.**

VEHICLES

18. **Continue to provide and maintain safe 2WD accessible roads to key locations in the two Parks.**

19. **Consider bituminising gravel roads in the Parks as required.**

20. ***Liaise with authorities in whom enclave roads are vested to seek management of road verges compatible with the adjacent lands in the Parks and to ensure that roads and road verges are maintained in a safe condition while taking into account environmental and aesthetic values.***

21. **Liaise with the managers of roads around the Parks about road conditions and maintenance.**

HORSE RIDERS

22. **Continue to allow horse riding on public roads only in both Parks.**

CYCLISTS

23. **Continue to facilitate cycling on public roads in both Parks.**

24. **Liaise with mountain bike enthusiasts regarding the designation of a path in PNP for use by mountain bikes.**

25. **Investigate provision of cycling opportunities on existing vehicle access tracks in suitable flatter areas of SRNP.**

VISITORS WITH DISABILITIES

26. **Provide and maintain access for visitors with disabilities at all new or upgraded vehicle accessible recreation sites.**

27. **Provide and maintain at least one path in each Park which is accessible to wheelchairs and to visitors with visual impairment.**

SIGHTSEEING AND PHOTOGRAPHY

The objective is to provide opportunities for sightseeing and photography to enhance visitor's enjoyment and appreciation of the Parks and their values.

Visitors making stops by the roadside can cause safety problems for other drivers and thus stopping places for cars are necessary. Lookout points also enable visitors to appreciate the beauty of the two Parks.

The visual impact of management actions needs to be considered at all times because of potential impacts on vistas and photographic subjects (see also 'Landscape').

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. **Continue to provide defined access to points from which to view major scenic attractions, either by vehicle or on foot, as indicated in Figures 12 and 13 (see 'Visitor Access').**

2. **Consider the visual impacts of all Park operations, particularly those visible from scenic lookouts.**

3. **Provide safe stopping places suitable for vehicles, including buses, at locations throughout the Parks which offer sightseeing and photographic opportunities. Signpost stopping places appropriately.**

4. **Encourage the provision of safe stopping places which provide views of the Ranges from roads**

around the Parks.

5. ***Provide, where possible, advice on request to private landholders and other agencies on minimising the visual impact of operations, especially on lands adjacent to or within the viewshed of lands in the Parks (see 'Landscape').***

PICNICKING

The objective is to provide a range of opportunities for picnicking to enhance visitors' enjoyment of the Parks.

Both Stirling Range and Porongurup National Parks provide sites and facilities for visitors to enjoy a picnic in the Park. Gas barbecues are provided at major sites. The provision of picnic shelters would help to protect visitors from harsh sun, rain and the possibility of material falling from overhead trees.

Stirling Range National Park
Currently (1999) there are nine picnic sites in SRNP. Picnic sites with toilets, gas barbecue facilities and tables are located at Moingup Spring, Bluff Knoll turn-off and at Red Gum Spring. The site at Bluff Knoll carpark has toilets and a shelter housing picnic tables. Sites with tables only are located at the bases of Mt Magog, Talyuberlup Peak, Toll Peak, Mt Trio and White Gum Flat.

Porongurup National Park
Currently (1999) there are two picnic sites in PNP. Tree in the Rock has gas barbecues, tables and toilets, while the site at Castle Rock carpark currently has one picnic table.

At peak visitor periods in PNP, the existing picnic facilities are inadequate. Both sites are in need of redesign to better separate vehicles and people. Car parking areas at the sites are also inadequate. Alternative picnic areas would alleviate the pressure on both the existing sites in the Park.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. **Provide at a minimum, picnic areas at the following locations in SRNP (see 'Recreation Facilities' and Figure 12 for further detail):**
   - **a site in the vicinity of Red Gum Pass Road;**
   - **three sites along Stirling Range Drive;**
   - **a site in the Moingup Spring area;**
   - **a site in the vicinity of Bluff Knoll;**
   - **a site in the vicinity of Mt Trio; and**
   - **a site in the vicinity of Kojaneerup Spring.**

2. **Provide at a minimum, picnic areas at the following locations in PNP (see 'Recreation Facilities' and Figure 13 for further detail):**
   - **a site in the Tree in the Rock area;**
   - **a site in the Castle Rock area; and**
   - **a site in the vicinity of the Scenic Drive.**

3. **Continually monitor recreation facilities and sites in terms of location, facilities, design and suitability, and restore, close or redevelop as appropriate.**

4. ***Consider the provision of new recreation areas, including facilities and footpaths where appropriate, as resources for their development and maintenance become available.***

5. ***Maintain recreation sites in a safe, clean and tidy condition.***
6. **Consider the provision of picnic shelters at some sites to protect visitors from factors such as rainfall and the possibility of material falling from overhead trees.**

7. ***Minimise impacts of recreation activities on nature conservation and aesthetic values.***

NATURE APPRECIATION

The objective is to enhance the experience of visitors to the Parks by providing opportunities to experience and appreciate their natural attributes.

With their wealth of natural attributes, both Parks are havens for observers of nature. Perhaps the most popular aspect of the Parks is their flora.

Bird watching is practised in both Parks and geology

and mountain landscapes are also of great interest.

SRNP would appear to be an ideal site for a visitor centre where information could be displayed, questions answered and visitors motivated to learn more about the Park (see 'Information, Interpretation and Education'). Such a facility could also include a living display of flora of special significance from the Stirling Range. This would have the dual benefits of making the unique flora of the Range more accessible, while at the same time protecting vulnerable wild populations from damage caused by trampling and the illegal picking of samples.

STRATEGIES

1. **Provide information on the physical and biological attributes of the Parks as indicated in 'Information, Interpretation and Education'.**

2. **Examine the feasibility of developing a visitor centre in SRNP in the vicinity of the Bluff Knoll Road and seek resources to enable construction and maintenance if its development is recommended (see 'Information, Interpretation and Education').**

3. **Consider the incorporation of a living display of flora of special significance from SRNP in the proposed visitor centre.**

4. **Consider the provision of 'hides' beside some paths to facilitate the viewing of fauna.**

5. **Provide safe access to points of special natural interest where this can be achieved without threat to the resource itself (see 'Visitor Access').**

OVERNIGHT STAYS

The objective is to provide for overnight stays in the Parks where this will complement opportunities outside the Park boundaries.

Stirling Range National Park

A camping area is provided at Moingup Spring within the Park. On the northern boundary of the Park is a privately owned caravan park which provides a range of accommodation. Farm stay accommodation is also available in the vicinity of the Park.

Both Moingup Spring and the Stirling Range Caravan Park cater for tents and caravans and are only 10 kilometres apart. Moingup Spring, however, has remained popular with campers due to its bush setting within the centre of the Park.

Backpackers are permitted to camp in the more remote parts of the Park. They are required to carry their own portable stoves for cooking (although these cannot be used on days of very high or extreme fire danger). Open fires are prohibited in the Park due to the risk of wildfire and also because firewood collection causes damage to native vegetation. The private caravan park adjacent to SRNP allows fires, and gas barbecues at Moingup Springs have proven popular. The eastern end of the Park is especially popular with backpackers and some regulation of camping activity may be necessary in this area to ensure that over-use does not cause unacceptable environmental degradation.

Porongurup National Park

Camping areas are currently not provided in PNP mainly because of the Park's small size. Waddy's Hut on the south side of the Range has traditionally been available for overnight stays by arrangement with the Ranger but the building is in need of maintenance. Water but no toilets are provided. There is potential to provide for overnight stays for educational groups in PNP at the proposed new Castle Rock recreation site (see 'Information, Interpretation and Education').

Backpackers are permitted to camp in some areas of the Park by arrangement with the Ranger. They are required to carry their own portable stoves for cooking (although these cannot be used on days of very high or extreme fire danger) as open fires are prohibited.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. **Redesign the campground at Moingup Spring maintaining it as a low key facility.**

2. **Cater for a range of camping requirements at**

the Moingup Spring campground, such as small or large group camping, and provide facilities for visitors with disabilities.

3. **Continue the current ban on camp fires within the Parks.**

4. **Consider the provision of a campground for use only by educational groups at the proposed new Castle Rock recreation site (see 'Recreation Facilities' and 'Information, Interpretation and Education').**

5. **Permit backpack camping away from developed areas in the 'Wilderness' and 'Natural Environment' zones only (see 'Zoning').**

6. **Consider the designation of backpack camping sites if the impacts of dispersed backpack camping become unacceptable.**

7. ***Ensure campsites are properly maintained and that environmental impacts are kept within predetermined limits.***

8. **Allow the use of portable stoves by campers except on days of very high or extreme fire danger.**

9. **Upgrade Waddy's Hut and continue to permit its use for overnight stays by arrangement with the Park ranger.**

10. **Consider the introduction of a fee for the use of Waddy's Hut.**

11. **Monitor the impacts of overnight stays in the Parks and make any necessary changes to management practices in the light of results.**

12. **Encourage the provision of accommodation suitable for Park visitors in surrounding areas.**

ADVENTURE ACTIVITIES

The objective is to facilitate enjoyment of the Parks for a range of adventure activities in a manner which minimises impact on other visitors and on Park values.

As the only significant mountain ranges in the south-west of WA, both Parks are popular for a variety of adventure recreation pursuits. Commercial adventure tour operators are also covered under 'Commercial Visitor Services'.

GENERAL STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. ***Recognise and manage for adventure activities as legitimate forms of public recreation in the Parks subject to protection of conservation values, safety and the enjoyment of other visitors.***

2. ***Establish and maintain liaison with representative bodies of adventure activities to encourage 'feedback' and advice on management and controls and to share knowledge of safety and rescue procedures.***

3. ***Consider the special requirements of wilderness users (for example, scenic quality, feeling of remoteness, need for self-reliance).***

4. **Promote codes of ethics for all adventure activities.**

5. **Provide registers for back country users in both Parks and require back country users to record the details of trips in the register prior to setting out.**

6. **Require leaders and instructors of commercial and educational visitor services to hold the appropriate level of accreditation for their activities.**

7. **Monitor the impacts of all adventure activities in the Parks and liaise with user groups in determining appropriate action should unacceptable impacts on Park values or on other users be occurring.**

ROCK CLIMBING

Both the Stirling and Porongurup Ranges are highly regarded rock climbing areas.

Climbers use public paths where they exist to reach the base of cliff faces and to return after completing their climbing. In the more popular areas, they also use indistinct 'climber's paths' to access rock faces from public paths or the more popular bushwalking routes.

There have been instances of Park visitors throwing stones or even large rocks down cliffs on which people were climbing and consequently measures are required to make non-climbing visitors aware of the possible presence of climbers on cliff faces. The use of rock faces for abseiling presents similar problems as it is not unusual for rocks to be accidentally dislodged by abseilers, again presenting a serious risk to any climbers below. In addition, the use of rock faces for abseiling can lead to safety problems if abseilers descending cliffs encounter climbers ascending them. Separation of these activities is required (see also 'Abseiling').

Climbers sometimes need to stay overnight in the Parks to avoid having to come down from the mountains after dark with the increased risk of accidents that this entails.

Climbers are represented at the State level by the Climbers Association of WA (CAWA) which adopted a Code of Ethics for climbers in May 1989. This covers such issues as safety, environmental protection, interaction with the non-climbing public and climbing etiquette. A 'Code of Conduct on Bolting' covers the use of fixed protection in south-west WA.

Careful management of rock climbing areas is essential to ensure that these groups do not have a detrimental impact on the environment of climbing areas and on the experience of other Park users.

Stirling Range

The Range offers some of the most challenging climbs in the south-west in a 'wilderness' environment. Large faces such as Bluff Knoll and Pyungoorup are the only places in WA where climbers can gain the skills required for semi-alpine style climbing or mountaineering.

The over-riding popularity of Bluff Knoll (probably greater than 95% of activity) with both climbers and abseilers has led to some safety problems, with abseilers descending cliffs unaware of climbers ascending below.

Following several incidents, guidelines for the management of abseiling at Bluff Knoll were introduced by CALM on an interim basis in 1994. The guidelines require the following:

- Abseilers are restricted to the cliffs west of the main north face (the so-called North-West Bay, Bastian Buttress and Tourist Crags);
- All abseilers and rock climbers are required to register their intentions on the day in the log book at the Bluff Knoll turn-off picnic area;
- Fixed protection is not permitted other than in accordance with the 'Code of Conduct on Bolting' (except in emergency situations).

These guidelines appear to have solved the problems previously encountered in the Bluff Knoll area.

Porongurup Range

Climbing began in the Porongurup Range in the late 1960s with the Range being valued for its towering granite domes with their spectacular views.

The smooth granites of the Range offer few natural placements for protection and thus fixed protection is seen by most climbers as essential on the large, exposed rock faces for safety reasons.

STRATEGIES

1. **Require all rock climbers in the Parks to adhere to the Climbing Association of Western Australia's 'Code of Climbing Ethics'.**

2. **Designate an 'Adventure Climbing Zone' in SRNP including the eastern Bluff Knoll faces (commencing with the 'Main North Face') and extending to the eastern end of the main range.**

3. **Allow low impact climber's access where it is necessary and not causing unacceptable negative impacts.**

4. **Set maximum sizes for groups of climbers permitted to bivouac at climbing sites. Require groups larger than the maximum size to leave**

climbing sites at the end of the day and camp at designated camping areas.

5. **Require commercial rock climbing groups to notify Departmental staff before undertaking any activities.**

6. **Require all rock climbers to record the details of proposed climbing activities in the registers provided in the Parks prior to setting out.**

7. **Make other Park users aware of the presence of rock climbers and warn them of the dangers of throwing any objects over cliffs or down slopes.**

ABSEILING

Abseiling is the technique of descending a vertical or near vertical surface by means of a rope. The technique relies on a fixed anchor point at the top of the cliff to which the rope is attached.

As discussed in 'Rock Climbing', safety problems arise if abseilers use the same cliffs as rock climbers because those on top of a cliff can be unaware of the presence of climbers below.

For a descent which is too long for a single rope, abseilers will occasionally install a series of anchor points to create a multi-pitch abseil line. If fixed protection (rock bolts or pitons) are used, the same ethical issues as are discussed in 'Rock Climbing' apply. Clearly the use of fixed protection for abseiling in a 'no bolting' climbing zone would create an undesirable inconsistency.

There has been a dramatic increase in the numbers of people wishing to use the two Parks, but particularly the Bluff Knoll area, for abseiling.
Relatively large groups of beginners under instruction are usually involved. This requires certain minimum standards of experience and competency in instructors and acceptable student to instructor ratios.

STRATEGIES

1. **Prohibit abseiling in the 'Adventure Climbing Zone' (see 'Rock Climbing') except in emergencies or as a necessary part of rock climbing activities.**

2. **Continue to permit abseiling in other areas of SRNP and PNP as long as safety considerations or impacts on the environment and on other Park users do not warrant further restrictions. Review access for abseiling if necessary.**

3. **Require all abseilers to record the details of proposed abseiling activities in the register provided in the Parks prior to setting out.**

4. **Require commercial abseiling groups to notify Departmental staff before undertaking any activities.**

5. **Set maximum sizes for commercial abseiling groups and review group size on the basis of impacts and safety considerations.**

ORIENTEERING / ROGAINING / MOUNTAIN RUNNING

Neither Park is used regularly for the navigational activities of orienteering or rogaining at present. Any future low levels of use of selected areas of the Parks would be unlikely to cause significant degradation.

A base camp can be a requirement of rogaining if the event continues through the night. Such facilities are often best located outside the Park boundaries.

Mountain running events have been held on the Bluff Knoll path. These were competitive events and involved runners from Australia and overseas.

Vehicle parking is required for all these sports.

STRATEGIES

1. **Permit orienteering and rogaining in the 'Natural Environment' and 'Recreation' Zones only (see 'Zoning').**

2. **Permit mountain running, under strict guidelines, in the 'Recreation' Zone only (see 'Zoning').**

3. **Assess individual requests for permission to**

conduct orienteering, rogaining and mountain running events on the basis of their likely impacts on the environment and on other Park users.

NON-MOTORISED RECREATIONAL FLYING

Three main forms of non-motorised recreational flying need consideration in the Parks:

- gliding;
- hang gliding; and
- para gliding.

Gliding is a popular sport in the area, particularly over SRNP where the mountains create strong uplifting air currents ideal for the sport. Gliding over PNP does not appear to be popular at present. No specific management actions for gliding are required at present, however, the situation will be kept under review.

Hang gliders use craft made of a framework covered in fabric. Due to dieback concerns, Hamilla Hill in SRNP, a site formerly approved for use by hang gliders, is now excluded. The site is in the 'Special Conservation' Zone in which access is restricted (see 'Zoning'). Interim approval has been given for hang gliding and para gliding from the cleared area known as the Old Farm on the north side of the Porongurup Range. Hang gliders require access (either for vehicles or pedestrians) to a site used for the set-out of gliders and for take-off. The site must be cleared or covered by low vegetation only and be free of obstructions in the flight path. A suitable clear landing site is also required.

Para gliders use modified parachutes which have no rigid frames. A para glider weighs approximately 8 kilograms and is packed into a small backpack enabling access to any area accessible to bush walkers. Interim approval has been granted for the use of the Old Farm in PNP. Para gliders require a small take-off area only and a flight path free of obstructions. A clear landing area is also required.

Both hang gliders and para gliders are regarded as non-powered aircraft by the Civil Aviation Authority and their use is subject to Air Navigation Regulations. Conditions are specified including mandatory qualifications for pilots, permissible locations and heights of glider use, etc. Potential sites must be evaluated and rated to indicate the level of expertise required for their use.

Concern has been expressed by some Park users about the visual impact of recreational aircraft and in particular their impact on the feeling of remoteness valued by back country users.

STRATEGIES

1. **Continue to allow the use by permit of the cleared area known as the Old Farm on the north side of the Porongurup Range as a launch site for both hang gliders and para gliders unless rehabilitation of the area makes it unsuitable for such use (see also 'European History and Cultural Resources').**

2. **Cancel the approval for the use of the Hamilla Hills area of SRNP as a hang gliding and para gliding site.**

3. **Consider any requests from the Hang Gliding Association of WA for additional hang gliding and para gliding sites in view of potential impacts and the technical requirements of such sites.**

4. **Approve appropriate hang gliding and para gliding sites if warranted.**

5. **Continue to liaise with the Hang Gliding Association of WA about the impacts of hang gliding and para gliding activities on Park values and on other Park users.**

6. **Review access for hang gliding and para gliding as necessary.**

7. **Prohibit the use of motorised hang gliders from sites within the Parks.**

RECREATION FACILITIES

The objective is to facilitate a range of low impact recreation activities and to minimise conflict between user groups.

Facilities in the Parks are designed to encourage a range of low impact recreational pursuits.

A number of recreation sites will be provided in each Park in order to facilitate a variety of experiences and to alleviate the problem of congestion, particularly in PNP. The main recreation sites proposed are detailed in 'Picnicking'. In addition, carparks and minimal facilities, such as information, will be provided at the commencement of paths (see 'Visitor Access'). The proposed locations for these sites are indicated in Figures 12 and 13. Entry stations will be provided at strategic locations in the Parks to enable the dissemination of visitor information (see 'Information, Interpretation and Education') and to facilitate the collection of visitor fees (see 'Funding'). Some forms of recreation are not compatible with each other and need to be separated to avoid conflict between user groups. Wilderness recreation, for example, requires areas where recreational facilities are primitive only (see 'Zoning').

The ladder and walkway at Castle Rock were installed many decades ago and require upgrading if this is feasible. They are unsightly and not in keeping with the style of facilities in PNP. The climb to the top of Castle Rock has, however, been very popular with visitors for many years.

Site development concept plans for the major recreation sites in the two Parks (Moingup Spring, Bluff Knoll, Tree-in-the Rock picnic area, Castle Rock recreation area and Scenic Drive picnic area) have been developed. Detailed development plans will be produced prior to development of the sites.

STRATEGIES

1. **Ensure that all facilities are designed, developed and maintained in ways which minimise both the risk of dieback disease spread and of other potentially detrimental impacts on flora, fauna and landscape values.**

2. **Provide facilities at the recreation sites indicated in Figures 12 and 13.**

3. **Develop key recreation sites based on site development plans and in accordance with CALM standards.**

4. **Implement the zoning scheme detailed in 'Zoning'.**

5. **Develop a system to ensure equitable access to Park facilities if required.**

6. **Monitor the need for additional facilities resulting from changes in visitor use and provide them, if warranted, subject to assessment of their likely impact.**

7. **Replace the existing steps and walkway at Castle Rock with more suitable facilities if feasible.**

8. **Implement the relevant actions from other sections of this Plan.**

COMMERCIAL VISITOR SERVICES

The objective is to facilitate the provision of commercial visitor services which enhance the experience of visitors to the Parks in a manner which is consistent with management objectives for the Parks.

Where appropriate, services provided by CALM for visitors can be supplemented by commercial services to enhance the experience of visitors.

A number of commercial operations currently exist in the Parks including coach tours and adventure tours. Bushwalking, abseiling and rock climbing have all been conducted by commercial operators.

All commercial operators wishing to conduct commercial tourist activities in the Parks are required to obtain a licence and pay a fee. This assists with the management of impacts and the generation of income to offset the costs of Park management. Licences can be revoked if conditions are breached.

It is likely that during the life of this Plan, further opportunities for commercial activities will be explored. Proposals are carefully considered by CALM and require approval of the NPNCA and the Minister for the Environment. If approved, conditions

are established according to the potential impacts of the operation on the Parks, particularly on their conservation values and use by other visitors.

Conditions may include specification of maximum group sizes, areas of use, times of use and the types of vehicles used for transport. The number of licences for certain activities may be restricted for environmental and public safety reasons.

The suggestion has been made that a Cable Car should be developed at Bluff Knoll. Any development of this nature would require a feasibility study which could possibly be carried out during the life of this Plan. Environmental, cultural, landscape, safety and economic issues, as well as alternative sites in the Parks would all require careful consideration in such a study.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. **Identify opportunities for enhancement of visitor experiences in the Parks (including Aboriginal cultural tourism programs) and actively seek commercial operators to provide visitor services by way of leases or licences where appropriate opportunities are identified.**

2. ***Require all commercial tour operators wishing to make use of the Parks to obtain the appropriate lease or licence and to pay the necessary fees for their activities.***

3. ***Protect the Parks from any undue environmental impact caused by commercial visitor services and require operators to adopt safe procedures for the activities they provide.***

4. ***Encourage commercial operators to maintain appropriate standards with respect to information and quality of service provided.***

5. ***Identify the sustainable level of tourist operator use of each area of the Parks where concessionaires wish to operate, monitor the impacts and regulate activities as required.***

6. ***Establish and promote regular contact with tour operators so that they are kept abreast of regional and local management initiatives, developments, access restrictions and road conditions.***

7. **Monitor commercial tour operators for adherence to licence conditions.**

8. **Evaluate any future proposals for the provision of commercial visitor services according to the following criteria:**
   - **Appropriateness in the zones concerned;**
   - **CALM's management capability.**
   - **Consistency with existing commercial operations;**
   - **Consistency with management objectives for the Park;**
   - **Potential impacts on Park values;**
   - **Safety implications.**

9. **Ensure in the event of feasibility study being conducted into a Cable Car development in the Parks, that environmental, cultural, landscape, safety and economic issues are all considered and that alternative sites in the Parks are evaluated, all at the cost of the proponent.**

PETS

The objective is to protect the Parks and their visitors from the negative impacts of pets.

Domestic pets are not permitted in national parks except where specified zones are created. There are a number of reasons for this, including disturbance to wildlife and to Park visitors, potential for introduction of animal disease and fouling of recreation sites. Pets are not permitted in either Park as the extremely high wildlife values and limited number of recreation sites would exacerbate the problems associated with pets. Both Parks are comprehensively baited for foxes, creating conditions which are hazardous to dogs at all times.

Guide dogs for the blind and tracker dogs for use in search and rescue operations are permitted in all national parks. However, these animals should be muzzled prior to entering the Parks to prevent them

picking up baits.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. **Continue to disallow pets in both Parks.**

2. ***Provide information explaining the Departmental policy on pets to the public and enforce it as necessary.***

3. **Continue to allow guide dogs for the blind and tracker dogs for use in search and rescue operations. Provide advice to owners that these animals should be muzzled prior to entering the Parks to prevent them from picking up baits.**

VISITOR SAFETY

The objective is to minimise risks to visitors' safety while not unnecessarily detracting from Park values.

As the manager of the two Parks, CALM has a responsibility to consider the safety of visitors at all times. Recreation in natural environments carries with it some risks additional to those inherent in other environments. Signs warning of unusual dangers have been installed at strategic locations throughout the Parks.

Mountain recreation can involve some risks for visitors. The mountains are favoured locations for 'risk' recreational pursuits such as rock climbing, abseiling and hang gliding.

Back country users in SRNP are requested to enter details of their activities in registers located at Moingup Spring and at the Bluff Knoll turn-off. These details can be used to assist in search and rescue operations if required. No such register currently exists in PNP.

The presence of karri forest canopy above the Tree in the Rock picnic area and some of the paths in PNP poses a risk of falling limbs. Signs warning of the danger of falling limbs were installed in this area in 1994.

As in any area serviced by roads, safety is an important consideration. Of particular concern is the practice of pulling to the side of the road and alighting to examine wildflowers, etc. The provision of safe stopping places is an important element in ensuring the safety of vehicle-based visitors. The maintenance of gravel roads is also important for the safety of visitors. Should the cost of adequate maintenance, including the supply of gravel, exceed the available funds, consideration will be given to bituminising them (see 'Visitor Access' and 'Gravel and Industrial Minerals').

Wildfire poses another potential threat to Park visitors. One of the objectives of the fire management program proposed in this Plan is to protect the lives of visitors from wildfire (see 'Fire'). The proposed creation of a mosaic of fuel ages should limit the potential run of any wildfires occurring within the Parks. However, in order to protect the safety of visitors it may be necessary to restrict access to certain areas of the Parks when the fire danger is very high or extreme.

The use of firearms would pose an unacceptable safety risk to visitors and cannot be permitted within these Parks (see also 'Aboriginal History and Cultural Resources').

Rescue equipment is maintained in both Parks and local CALM staff work in conjunction with the State Emergency Service and Police in the event of a search and rescue operation. Provision for the landing of a helicopter would assist in some cases (see also 'Military and Other Training').

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. ***Regularly inspect roads and recreation sites to ensure that potential hazards are identified and signposted, removed or avoided by relocation of the facility.***

2. ***Provide information for visitors which highlights unusually hazardous areas and activities.***

3. **Close parts or all of the Parks to visitors if necessary during periods of very high or extreme fire danger, or in the event of a serious wildfire in or threatening either Park. This may include evacuation of Park users.**

4. **Prepare evacuation plans for the two Parks within one year of the release of the Final Management Plan.**

5. **Implement programs to inform and educate Park visitors regarding the fire management program for the Parks and fire safety and survival (see 'Fire').**

6. **Provide registers for back country users in both Parks and require back country users to record the details of trips in the register when setting out.**
7. **Require leaders and instructors of commercial visitor services to hold the appropriate level of accreditation for their activities (see 'Adventure Activities').**

8. ***In liaison with the Police Department, prepare plans for dealing with accidents and search and rescue operations.***

9. ***Provide basic rescue equipment and staff training so as to be able to assist the Police in emergency situations.***

10. **Provide a 2WD accessible site suitable for use by helicopters only in search, rescue, training and other essential management operations in SRNP. (See also 'Military and Other Training').**

11. **Prohibit the use of firearms in the Parks except for essential management activities such as the destruction of injured fauna and the control of feral animals.**

COMMUNITY RELATIONS

INFORMATION, INTERPRETATION AND EDUCATION

The objective is to increase community enjoyment, awareness and understanding of the values and management of the Parks, and to encourage responsible use.

Information, interpretation and education are a vital part of CALM's charter to promote public awareness and appreciation of natural values and to encourage participation in their effective management.

Information and interpretation are provided through a range of media such as personal contact with Rangers and other staff (both formal and informal), information shelters, signs and a range of activities in the Parks.

Groups of students regularly visit the Parks in connection with their studies. In most cases, the groups are met by the Park ranger or other staff members and given a presentation covering relevant issues. There is potential to provide for overnight stays for such groups in PNP at the proposed new Castle Rock recreation site. Research projects by students are covered in 'Research and Monitoring'.

The major formal components of information, interpretation and education in the Parks at present are:

Stirling Range National Park
- Signs throughout the Park;
- Information shelters at Moingup Spring, Bluff Knoll turn-off and Bluff Knoll path;
- Park brochure;
- The Stirling Range Heritage Drive and brochure;
- Occasional school holiday activities run by Ranger staff; and
- Talks to educational groups.

Porongurup National Park
- Signs throughout the Park;
- Information shelter at Tree in the Rock Picnic Area;
- Park brochure;
- CALM's participation in the local Porongurup Festivals held twice yearly and organised by the Porongurup Tourist Promotion Association;
- The Bolganup Heritage Trail and brochure;
- Interpretive plaques along the Nancy Peak circuit path and on the Castle Rock path, and
- Talks to educational groups.

At present there is no major visitor centre in either Park and thus there is no obvious focal point for information, interpretation and education. SRNP would appear to be an ideal location for a visitor centre where information could be displayed, questions answered and visitors motivated to learn more about the Park (see also 'Nature Appreciation'). The most suitable area for the location of a visitor centre in SRNP would appear to be in the vicinity of the Bluff Knoll road. This area offers many suitable construction sites in the most heavily visited part of the Park (see 'Attractions and Existing Use').

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. **Develop and progressively implement 'Information, Education and Interpretation Plans' for the Parks incorporating elements such as:**
   - **Information displays at key sites;**
   - **Interpretive programs or facilities (guided or self-guiding);**
   - **Signs and brochures providing information on features and use of the Parks and interpretation of their environments;**
   - **Media coverage of specific issues.**

2. **Examine the feasibility of developing a visitor centre in SRNP in the vicinity of the Bluff Knoll Road and seek resources to provide for site assessment, design, construction and maintenance if its development is**

recommended.

3. **Consider the incorporation of a display of flora of special significance from SRNP in the proposed visitor centre (see 'Nature Appreciation').**

4. **Provide assistance to educational groups where possible.**

5. **Consider the provision of a campground for use only by educational groups at the proposed new Castle Rock recreation area (see 'Overnight Stays' and 'Recreation Facilities').**

6. **In liaison with program co-ordinators, modify any educational activities which may be having a detrimental impact on the Park environment or Park users.**

7. ***Liaise closely with other agencies, organisations and individuals (such as tourism agencies, schools, museums, Government tourist bureaux, individual guides and commercial operators), who have similar interests in the interpretation of the Parks.***

8. **Incorporate information and interpretation on a range of subjects as detailed in strategies contained in other sections of this Plan.**

LIAISON AND COMMUNITY INVOLVEMENT

The objective is to seek the participation of organisations and individuals in the management of the Parks both through the interchange of ideas and through the active involvement of community members.

Numerous organisations and individuals have a keen interest in the management of the two Parks.

The Planning Advisory Committee, comprising community members with a range of interests has played a central role in representing these views throughout the management planning process. The contributions of Committee members to the Plan were invaluable.

'Friends' groups are active in both Parks and have also assisted with the preparation of this Plan. In addition, many other community members including local residents, Park users, conservation groups and State and local government agencies have points of view concerning the management of the Parks. Although these groups have been actively canvassed during the management planning process, continuing liaison is essential to enable Park management to be responsive to changing community attitudes.

Some groups and individuals have also become actively involved in Park management by working as volunteers. CALM is keen to facilitate such assistance as the involvement of community groups will form a valuable part of the implementation of this Management Plan.

The role of the Planning Advisory Committee officially ends when the Final Plan is released. This group has played a major role in the preparation of this Plan and has demonstrated considerable expertise throughout the process. A similar group will play a valuable role in advising CALM on the implementation of the Final Plan.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992.)

1. **In consultation with existing members, revise the structure and membership of the Planning Advisory Committee to create a group which will be available to provide advice to CALM regarding implementation of this Management Plan.**

2. ***Continue existing involvement with local individuals and organisations with an interest in conservation and land management.***

3. **Continue to support the 'friends' groups for both Parks.**

4. ***Seek regular 'feed back' from the community on Departmental policies and management practices through both formal and informal contacts.***

5. **Encourage community involvement in the implementation of this Plan.**

COMMERCIAL AND OTHER USES

GRAVEL AND INDUSTRIAL MINERALS

The objective is to minimise the impact of the extraction of gravel and industrial minerals on Park values and to ensure satisfactory rehabilitation of all pits within the Parks.

Gravel, predominantly for use on roads within the two Parks, has been extracted for many years by CALM, local authorities and Main Roads WA. Some pits are still in use while others have been fully worked out and have been, or have yet to be, rehabilitated.

Maintenance costs of gravel roads are high and in some cases, capital funds will be required to seal these roads. Gravel will be required for resurfacing of Park roads prior to sealing. Suitable gravel reserves are in short supply in both Parks and should be conserved where possible.

Local authorities sometimes request gravel supplies from within the Parks for use on roads outside Park boundaries. CALM will continue to work with local authorities in such cases, although under current Government policy, such requests can only be accommodated where the road is essential to the Park and where it can be proved that no other gravel sources are available.

No extraction of industrial minerals (sand, building stone etc.) is taking place in the Parks at present (1999).

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. ***Assess all requests for access to gravel and industrial minerals in the Parks within the context of Government and Departmental policies.***

2. **Wherever practicable and in particular where they are required for use outside the Parks, obtain supplies of gravel and industrial minerals from outside Park boundaries.**

3. **Conduct surveys to determine available gravel reserves in both Parks.**

4. **Where approval for extraction from within the Parks is formally granted, identify suitable sources of gravel and industrial minerals within the Parks, develop extraction / rehabilitation plans and minimise the impacts of extraction on the Parks' physical, biological, cultural and visual resources.**

5. **Endeavour to ensure that the use or extraction of gravel and industrial minerals within the Parks, by CALM or by other agencies, does not contribute to the spread of dieback disease.**

6. ***Ensure that correct rehabilitation procedures are undertaken at extraction sites at the expense of the extracting agency.***

7. **Consider sealing gravel roads in the Parks if maintenance costs of the gravel road exceed funds available. Current (1999) priorities are:**
   - **Stirling Range Drive;**
   - **Porongurup Scenic Drive.**

MINERAL RESOURCE DEVELOPMENT

The objective is to protect SRNP and PNP through implementation of Government policy on mining and exploration in national parks.

Any proposal for mineral resource development in either of the Parks would be governed by the provisions of the Mining Act (1978) and by Government policy. Because of the extremely high conservation values and scenic beauty of the two Parks, any mining or exploration activity in these areas

would be likely to have significant detrimental impacts.

Gravel, sand and stone extraction are covered in 'Gravel and Industrial Minerals'.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. **Liaise with the Department of Environmental Protection, the Department of Minerals and Energy, the mining industry, and, where appropriate, the Department of Resources Development, over any proposals for exploration or mineral resource development which may be considered within or near to the Parks.**
2. ***Evaluate the likely impacts of any proposed exploration or proposed mineral resource development activities on the Parks and make recommendations within the context of Government policy.***

3. **Oppose any exploration or mineral resource development activity which would have deleterious impacts on Park values.**

PARK SERVICES

The objective is to facilitate management of the Parks through the provision and maintenance of support services which have minimal impact on Park values.

Effective management of national parks requires provision of Park services to support the presence of resident staff. Park services are currently concentrated at two locations in SRNP and one in PNP.

Stirling Range National Park
The major services are located at Moingup Spring and at the Bluff Knoll turn-off in SRNP. They are currently (1999):
- Ranger residences and outbuildings (both);
- Workshops (both);
- Washdown pad (Moingup Spring);
- Mobile ranger facilities (Moingup Spring);
- Fuel storage facilities (Moingup Spring);
- Generator (Moingup Spring);
- Water catchment area and storage tanks (Bluff Knoll turn-off);
- Water bore and storage tank (Moingup Spring).

Rubbish pits were previously maintained in the Park but these have been closed and rehabilitated, all rubbish now being transported to rubbish tips outside the Park.

It is possible that during the life of this Plan, management responsibilities in SRNP will increase to the point where additional ranger staff will be required in the Park. If another ranger residence is constructed, consideration should be given to locating this facility at the western end of the Park to provide a broader spread of management capability.

Porongurup National Park
Services are located on Bolganup Road and currently (1999) include:
- Ranger residence and outbuildings;
- Workshop;
- Washdown pad;
- Mobile ranger facilities;
- Fuel storage facilities;
- Water catchment area and storage tanks.

STRATEGIES

1. **Ensure the provision and proper maintenance of Park services to facilitate effective management of the Parks.**

2. **Monitor the impacts of Park services on the environment and on visitors and their activities, and take steps to rectify any unacceptable impacts.**

3. **Consider the provision of an additional ranger residence and support services for SRNP if warranted by Park management requirements.**

4. **Provide additional Park services only where they are essential and where their impact on Park values can be minimised.**

MANAGEMENT ACCESS

The objective is to facilitate management of the two Parks by the provision and maintenance of a system of management access tracks.

In order to effectively manage the two Parks, it is necessary for CALM to maintain some 'non-public' tracks. These access ways are used in activities such as fire management, search and rescue operations, feral animal and weed control, and research projects. Many of the existing tracks in the Parks are no longer essential for management purposes.

STRATEGIES

1. **Maintain to a suitable standard a system of strategic firebreaks for fire and other management access, closed to public motor vehicles and subject to dieback hygiene requirements for any management use. This may include limited relocation of some existing tracks. (See also 'Fire').**

2. **Require managers to obtain a permit subject to NPNCA approval when seeking entry to the 'Wilderness' or 'Special Conservation' zones in the Parks for essential management purposes.**

3. **Close and rehabilitate all non-essential management tracks.**

OTHER COMMERCIAL USES

The objective is to protect the natural and cultural values of the Parks from degradation by other commercial uses.

Because of their natural beauty, CALM receives frequent requests from commercial photographers and film makers wanting access to the Parks. A fee is payable and permits are issued for such use.

Although at present (1999) there are no proposals for other commercial use in the two Parks, it is possible that during the life of this Plan, new proposals will emerge.

STRATEGIES

1. **Identify appropriate opportunities for commercial activities in the Parks and seek suitable operators.**

2. **Require all organisations wishing to carry out commercial activities in the Parks to obtain the appropriate license or lease and to pay the necessary fees for their activities.**

3. **Assess all proposals for commercial use in SRNP or PNP and approve such operations subject to comprehensive conditions where appropriate.**

4. **Monitor commercial operators for adherence to licence and lease conditions.**

PUBLIC UTILITIES

The objective is to minimise the impact on the Parks of public utilities and the corridors through which they are provided.

Both SRNP and PNP contain public utilities and are traversed by public utility corridors. The main utilities involved at present are radio transmitters, water catchments and power and telephone lines. Public roads are covered in 'Land Tenure'.

The potential visual impacts of structures high in the landscape must be carefully evaluated. The use of solar power where possible removes the need for power lines through the Parks.

A dam over Bolganup Creek in PNP was constructed in 1956 to provide a water supply for the towns of Porongurup and Mt Barker. In early 1970, drains were added in the area to increase water catchment so that an adequate water supply could be obtained.

Power is provided to the ranger's residence at the Bluff Knoll turn-off in SRNP through overhead lines which traverse a short section of the Park from the northern boundary. Underground telephone cables also service this residence. There are no power or telephone lines to the ranger's residence at Moingup Spring (the residence is on generator power and has a radio telephone). In PNP, power is provided to the ranger's residence by overhead lines which run along side Bolganup Road, while the telephone lines are underground.

The PNP Ranger's residence is serviced by scheme water, whereas both residences in SRNP have their own water supply catchments.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. ***Liaise with officers in charge of key public utilities to ascertain whether any proposals are likely to affect the Parks.***

2. **Allow new public utilities only where these are consistent with the purposes of the Parks.**

3. ***Negotiate to obtain relocation of infrastructure or rescheduling of operations connected with public utilities where this is necessary to minimise impact on the Parks.***

4. ***Ensure that land disturbed by the installation and/or maintenance of public utilities is adequately rehabilitated at the expense of the responsible authority.***

5. ***Review existing communications facilities in the Parks and, where no serious environmental***

problems occur, allow them to remain.

6. **Permit the establishment of new and relocated communications facilities within the Parks only where these facilities are consistent with the purposes of the Parks and where no viable alternative exists.**

7. ***Only allow sharing of CALM communications facilities in the Parks where the reliability and effectiveness of CALM communications will not be impeded.***

8. ***Restrict the sharing of communication sites in the Parks to approved Government agencies, local Government and other essential services.***

9. ***Ensure that the costs of joint communications facilities are shared on an equitable basis by all users.***

10. ***Accommodate requests for the placement of temporary radio masts only where they will not lead to unacceptable environmental or other impacts.***

11. **Minimise the visual impacts of public utilities in the Parks by techniques such as careful positioning of facilities, the use of dull, non-reflective materials and provision of solar power.**

12. ***Continue close liaison with water supply authorities over the Bolganup Dam.***

13. ***Evaluate the potential impact of any water supply proposals on the Parks.***

14. ***Manage water catchments in the Parks to keep deleterious impacts on water quality and quantity within the specified standards.***

MILITARY AND OTHER TRAINING

The objective is to minimise impacts associated with military and other training on Park values and on other users.

Because of their challenging terrain, both Parks have been used for military and other training purposes for many years.

The Department's policy statement on 'Defence Force Training on CALM Managed Lands and Waters', released in April 1996, applies in both Parks. This policy provides for training of groups of up to 30 soldiers over periods of one to five days in national parks. Approval for larger groups (up to 100 soldiers) has been granted, in the case of the SAS, subject to stringent controls.

Concerns over the impacts of military training on both the environment and on other Park visitors have been progressively addressed over a number of years. Military training has been excluded from the 'Special Conservation' Zone in SRNP since its delineation in 1993. Approval for training activities has only been granted in the dry season when the risk of dieback disease spread is minimal and on condition that activities are to cease if wet conditions increase the risk of dieback disease spread prior to or during an exercise. In addition, to ensure the safety and well-being of Park visitors and wildlife, no live or blank ammunition has been allowed to be fired in the Park.

In the past, military personnel and equipment have been made available to assist in various Park management activities. These arrangements have been to the benefit of the Parks and there is potential for further development of such joint projects in the future. Some training exercises require support from helicopters. A suitable landing site for helicopters in SRNP is required for the safe conduct of such activities and would also assist in search and rescue activities in the Park (see also 'Visitor Safety'). Attempts have been made to discourage the practice of military aircraft being flown at low altitude over the Parks.

Other organisations also use the Parks for training purposes. In particular, the State Emergency Service conducts rock climbing and search and rescue training exercises in the Parks on a regular basis.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. **Implement the Department's policy on**

'Defence Force Training on CALM Managed Lands and Waters', seeking variations to its guidelines only in exceptional circumstances.

2. **Exclude military and other training exercises from the 'Wilderness' and 'Special Conservation' zones (see 'Zoning').**

3. **Continue to prohibit the carrying of live or blank ammunition during military training exercises in the Parks.**

4. **Seek agreement from military authorities to avoid unnecessarily overflying the Parks and their environs with low-flying aircraft.**

5. ***Continue to approve specialist training activities (such as rock climbing and rescue) subject to:***
   - ***a) Selection of areas where any environmental impacts and impacts on other Park visitors are at acceptable levels;***
   - ***b) Sharing of knowledge with regard to rescue techniques with CALM staff;***
   - ***c) Full acceptance of risk by the co-ordinating organisation.***

6. ***Ensure that activities do not impose long term environmental threats, (such as dieback disease spread), to the Parks.***

7. **Designate a camping area for use by military and other training groups.**

8. **Provide a 2WD accessible site suitable for use by helicopters only in search, rescue, training and other essential management operations in SRNP (see also 'Visitor Safety').**

9. **Encourage organisations undertaking group training exercises in the Parks to participate in volunteer Park management projects.**

10. **Provide information to Park visitors on military and other training being conducted in the Parks.**

INTERACTION WITH NEARBY LANDS

PARK NEIGHBOURS

The objective is to foster co-operation between the Department and neighbours to the Parks in all areas of land management.

As discussed in 'Regional Context', both SRNP and PNP are largely surrounded by cleared agricultural land. The boundaries of SRNP are, from a management perspective, reasonably well located, however PNP has extremely irregular boundaries some of which are located on very steep terrain and which complicate Park management activities.

Management actions on lands adjoining the Parks can obviously have implications for Park management. Conversely, Park management impacts upon surrounding lands. In particular, the areas of fire management, access, landscape, erosion control, management of runoff water, weed and feral animal control and dieback disease management can benefit from a cooperative approach between Park managers and managers of adjoining lands.

There are two existing nature reserves (Camel Lake and South Stirlings) which share boundaries with SRNP (see 'Regional Context').

Privately owned land containing some uncleared native vegetation adjoins the Hamilla Hill section of SRNP and also exists in the vicinity of Reserve No. 13081 near the north-east corner of SRNP (discussed in 'Regional Context'). Other small areas of uncleared land also occur on the Park boundaries.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. **Continue close liaison with Park neighbours over all Park management practices and encourage management of their lands in sympathy with Park objectives.**

2. **Minimise any negative impacts of Park management activities on neighbouring lands and waters.**

3. ***Provide, where possible, advice on request to private landholders and other agencies on minimising the visual impact of operations, especially on lands adjacent to or within the viewshed of lands in the Parks (see 'Landscape').***

4. **Minimise the risk of wildfires crossing the Park boundaries (see 'Fire').**

5. **Consider for purchase and addition to the Parks any suitable adjoining private land which is available.**

6. **Consider for exchange and addition to the Parks any private land which has outstanding natural values or practical management values.**

LOCAL AUTHORITIES

The objective is to work co-operatively with Local Authorities to the benefit of the Parks and their users.

The two Parks are located within four Local Authority municipalities. SRNP straddles the boundaries of all four Local Authorities (Albany, Plantagenet, Cranbrook and Gnowangerup), while PNP is located wholly within Plantagenet Shire.

The four Local Authorities are closely involved with Park management issues through involvement in activities such as road maintenance (see 'Land Tenure'), fire management, weed and feral animal control programs, tourist promotion and representation on the Planning Advisory Committee.

Bluff Knoll Road, which services only Bluff Knoll in SRNP is currently vested in the Gnowangerup Shire.

As this road does not provide access to any residences and is not a through road for local traffic, it would seem more logical for it to be incorporated in the National Park. A similar situation exists with Bolganup Road from the intersection with the Scenic Drive in PNP.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. **Continue to liaise closely with the Shires of Plantagenet, Cranbrook and Gnowangerup and the City of Albany on all issues affecting the management of the two Parks.**

2. ***Encourage Local Authorities to adopt dieback disease control strategies consistent with those used by CALM.***

3. **Seek to have Bluff Knoll Road added to SRNP.**

4. **Seek to have Bolganup Road from the intersection with the Scenic Drive to its terminus added to PNP.**

5. ***Liaise with Local Authorities in whom boundary roads are vested to seek management of road verges compatible with that of the adjacent national parks and to ensure that roads and road verges are maintained in a safe condition while taking into account environmental and aesthetic values.***

MANAGEMENT ACCESS THROUGH PRIVATE LAND

The objective is to facilitate management of the two Parks by the maintenance of essential management access through private land.

Due to the steep terrain of the Porongurup Range, it is not possible to locate some tracks on the Park boundary wholly within the National Park. In a number of places, the boundary track has been constructed within adjoining private property. As these tracks are essential for management of PNP, problems would be created if management access were to be denied to any of these tracks.

No management tracks for SRNP are located on private property.

STRATEGIES

1. **Ensure that wherever practicable, management access is located within Park boundaries.**

2. **Liaise closely with Park neighbours through whose properties management access exists to ensure continued mutual availability for essential management purposes.**

3. **Provide resources towards the maintenance of access tracks through private land which are used for Park management.**

TOURISM IN SURROUNDING AREAS

The objective is to ensure that management of the two Parks recognises and enhances the appeal of the region to tourists.

The greater Albany region in which the two Parks are located has a growing reputation as a world class tourist destination. The appeal of SRNP and PNP is an important part of the tourist experience in the area but it is essential to recognise that the Ranges are just two of many attractions which tourists visit while in the region.

STRATEGIES

1. **Liaise closely with local tourism bodies to ensure that management of the two Parks considers their role in the broader tourism sphere.**

2. **Maintain liaison with individuals and organisations who provide facilities and services for tourists on lands nearby or adjacent to the Parks.**

RESEARCH AND MONITORING

RESEARCH AND MONITORING

The objective is to improve knowledge of Park resources, values, processes and human impacts and in particular, knowledge of threatened flora, fauna and ecological communities, so that management practices can be objectively evaluated and then refined if required.

Effective management practices must be based on a sound knowledge of the resources and values of the Parks. The South Coast Region is actively researching a number of fields relevant to the two Parks and also encourages educational institutions to become involved in research projects. The Region has produced a 'Research Prospectus' detailing research opportunities for students (CALM South Coast Region, 1995).

All research needs to be regularly reviewed and projects of value to the Parks should be encouraged. The success of management practices can then be monitored against research results, and practices changed if necessary.

Areas requiring further research include:
- local weather conditions and climate change;
- geology of SRNP;
- hydrological processes;
- biological patterns and processes in terrestrial and aquatic ecosystems;
- protection of threatened flora, fauna and ecological communities;
- effects of fire and plant diseases on survival and regeneration of flora and vegetation of special conservation interest;
- biological values of vegetation corridors;
- use of fire to maintain biological diversity;
- fire behaviour and ecology;
- spread of plant diseases;
- susceptibility of threatened and priority listed flora and threatened ecological communities to plant diseases;
- effectiveness of control programs on declared and non-declared introduced plants and feral animals;
- archaeological and anthropological significance of the Parks;
- visitor use numbers, patterns, preferences and perceptions; and
- methods for improving the long-term durability of mountain paths.

Strategies for these areas of research are included in the relevant sections of this Plan.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

RESEARCH

1. **Actively encourage research by CALM staff and other individuals, institutions and organisations into areas of high priority, as identified in other sections of the Plan.**

2. **Encourage the involvement of volunteers in research projects.**

3. ***Encourage research into the special nature conservation significance of upland areas and make any necessary modifications to management practices in the light of research findings.***

4. ***Establish research to evaluate ways of reducing footpath erosion, to investigate the most cost effective and environmentally acceptable methods of stabilising damaged footpaths and to clarify the extent to which use of footpaths may exacerbate spread of dieback disease.***

5. ***Encourage archaeological and ethnographic research by the Aboriginal Affairs Department, WA Museum, Aboriginal organisations and individuals.***

6. ***Encourage historical research by persons and organisations outside the Department.***

7. **Continue to require a permit to be obtained before any research is carried out in the Parks.**

8. **Ensure that there is regular liaison between research staff and Park managers and that research results are made available to managers so that Park management practices can be refined on the basis of improved knowledge.**

MONITORING

9. **Monitor the impact of management practices on all areas of the Parks, and adjust practices according to new information.**

10. **Monitor visitor activities to ensure they are not impacting detrimentally on ecosystems.**
11. ***Monitor the condition of wetlands and the management of wetland catchments in conjunction with other key organisations.***

GENERAL

12. **Implement the relevant strategies from other sections of this Plan.**

RESOURCE ASSESSMENT

The objective is to survey, record and maintain an inventory of resources and threats in the Parks and to use these inventories in planning developments, monitoring changes and refining management practices as required.

Resource assessment aims to gather baseline information about both Parks and document this information for use in assessing change and evaluating management practices. This data can be gathered by surveys, inventories and registers.

STRATEGIES

(Strategies in italics are adapted from strategies in the Regional Management Plan for the South Coast Region, 1992).

1. **Actively encourage surveys and inventories of areas of particular interest, by CALM staff, individuals, institutions and other organisations.**

2. **Develop and maintain registers of sites of particular significance (ethnographic, archaeological, historic, geological etc.) in the Parks.**

3. **Conduct surveys for special features prior to disturbance by new developments.**

4. **Conduct visitor surveys in both Parks to continue to keep informed about user requirements in order to plan for future use and upgrading of facilities.**

5. ***Maintain an inventory of the condition of all footpaths in upland and other areas of the Parks.***

6. ***List the wetland resources in the Parks and identify key values for each wetland.***

7. **Implement the relevant strategies from other sections of this Plan.**

IMPLEMENTATION

MANAGEMENT PRIORITIES

The objective is to implement the actions detailed in this Plan in order of priority as resources permit.

The key strategies of this Plan are listed at the front of the book.

It will not be possible for the Department to implement all the strategies detailed in this Plan at once and thus priorities have to be assigned. The rate of implementation will be dependent on the availability of funds and staff for SRNP and PNP and every effort needs to be made to attract resources. Priorities may need to be re-assessed as circumstances, including the availability of these resources, change. The involvement of a Parks advisory group will be an important element of this process (see 'Liaison and Community Involvement').

STRATEGIES

1. **Seek resources for the implementation of this Plan as detailed in 'Staffing' and 'Funding'.**

2. **Implement the management actions detailed in this Plan in order of priority, subject to availability of resources.**

3. **Review priorities periodically in consultation with the Parks advisory group and make any necessary changes.**

STAFFING

The objective is to provide sufficient staff for SRNP and PNP to enable successful implementation of this Plan.

There are currently (1999) two permanent rangers in SRNP and one in PNP. A part time staff member has also been stationed at the entrance to PNP at busy times.

Specialist staff (such as dieback disease interpreters, research biologists, fire specialists, recreation planners and interpretive officers) visit the Parks to examine and advise on specific management issues and to conduct research.

Groups and individuals from the community have indicated a strong desire to be actively involved in the implementation of this Plan through volunteer programs. Such offers are very welcome and will be an important element in the success of the Plan.

Successful implementation of this Plan will require a greater input from rangers and other staff than is available at present. Manual workloads and liaison duties will increase significantly.

STRATEGIES

1. **Consider the placement of additional ranger staff in the two Parks to enable effective implementation of this Plan.**

2. **Continue to utilise specialist Departmental staff as required.**

3. **Encourage the involvement of volunteers in the implementation of this Plan.**

FUNDING

The objective is to obtain sufficient funds to enable the effective implementation of this Plan.

As well as requiring staff (see 'Staffing'), the successful implementation of this Plan will require the provision of additional funds for the two Parks. Current budget allocations for the Parks are insufficient to undertake development of any of the new initiatives in this Plan or to ensure adequate levels of maintenance in the future.

The Department's policy on Recreation, Tourism and Visitor Services (Policy Number 18) states that whenever possible, fees will be collected from users when a service or opportunity is provided, as long as it is cost effective. Visitor fees have been collected in the two Parks since 1994 and camping fees are charged at the Moingup Spring campground. Fees are used to partially offset current management costs. The level of fees collected will influence the rate at which the actions in this Plan can be implemented. Charges for activity programs in the Parks can also raise funds for management.

As indicated in 'Management Priorities', the actions contained within this Plan will be implemented in priority order as resources permit, however, urgent management actions will require an early injection of funds into the Parks, followed by a continuing allocation to ensure further implementation and maintenance is possible.

STRATEGIES

1. **Actively seek a significant initial increase in the resources for SRNP and PNP to enable urgent completion of priority management actions.**

2. **Continue to collect visitor fees in the two Parks and to collect fees for camping and other activities and services when feasible. Use the funds collected to assist with improving and maintaining Park facilities and services.**

3. **Seek revenue from appropriate external sources including special grants and sponsorship.**

4. **Continue to seek resources for the two Parks sufficient to ensure the implementation of actions in this Plan.**

REVISION

This Plan will direct management of Stirling Range and Porongurup National Parks for a period of 10 years, the maximum permitted under Section 55(1) of the CALM Act.

The NPNCA is responsible for monitoring the implementation of this management plan. To facilitate review of the plan and its implementation CALM will report to the NPNCA as required.

Continuous evaluation of this Plan will take place during its 10 year life. Factors such as success of the management actions, scientific research advances and changes in community attitudes will be considered in this evaluation. The need for changes in management of the Parks will be assessed on the basis of the evaluation.

Should significant changes to this Plan be required during the 10 year period of its currency, public comment on the proposed revisions will be sought.

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