Flinders Chase National Park, Kelly Hill Conservation Park, Ravine des Casoars Wilderness Protection Area and Cape Bouguer Wilderness Protection Area Management Plans

Kangaroo Island South Australia

September 1999

Department for Environment, Heritage and Aboriginal Affairs

This plan of management has been prepared and adopted in pursuance of Section 38 of the *National Parks and Wildlife Act 1972*.

Flinders Chase National Park, Kelly Hill Conservation Park, Ravine des Casoars Wilderness Protection Area, and Cape Bouguer Wilderness Protection Area Management Plans

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Cover photographs, clockwise from top:
Cape du Couedic lighthouse and Casuarina Islets
The Ladders, Cape du Couedic
Sea box (*Alyxia buxifolia*) on limestone cliff top at Cape du Couedic
Western grey kangaroo (*Macropus fuliginosus*)
Weirs Cove ruin

FOREWORD

Flinders Chase National Park, Kelly Hill Conservation Park, Ravine des Casoars Wilderness Protection Area and Cape Bouguer Wilderness Protection Area together make up more than 10% of Kangaroo Island and contribute significantly towards the conservation of South Australia's biological diversity and natural heritage.

Kangaroo Island has long been recognised as a premier tourism destination, both nationally and internationally. This reputation is well founded, as the island contains some of the most intact ecosystems in the State. The wisdom of our forebears in setting aside large areas from clearance and development for the preservation of wildlife and the expert contribution of National Parks and Wildlife staff has left us with a priceless legacy.

It was indeed appropriate that the first wilderness areas proclaimed in South Australia under the *Wilderness Protection Act 1992* were on Kangaroo Island and these plans set out management intentions and prescriptions for two of the island's five wilderness protection areas. In essence, management will be aimed at preserving the wilderness qualities of Ravine des Casoars and Cape Bouguer Wilderness Protection Areas by minimising the impacts of modern technology.

In addition, the plans define the future management for both Flinders Chase National Park and Kelly Hill Conservation Park. Together, these two parks contribute to the conservation of the natural heritage of the west and south west of Kangaroo Island, as well as containing some of the most visited natural wonders in South Australia. Developments for improving visitor experience in these two parks will be of the highest standard, while maintaining the conservation and rehabilitation goals of the *National Parks and Wildlife Act*.

These plans were released in draft form for public review in June 1996. The eight written public submissions received after three months were reviewed by the Reserves Advisory Committee (now the Reserve Planning and Management Advisory Committee) and the Wilderness Advisory Committee and appropriate changes made to the plan. The contribution of the community in the development of these plans is appreciated and members of the public who have contributed are thanked.

The plans of management for Flinders Chase National Park and Kelly Hill Conservation Park are now formally adopted under the provisions of section 38 of the *National Parks and Wildlife Act 1972* and the plans of management for Ravine des Casoars Wilderness Protection Area and Cape Bouguer Wilderness Protection Area are now formally adopted under the provisions of section 31 of the *Wilderness Protection Act 1992*.

MRS DOROTHY KOTZ MP
MINISTER FOR ENVIRONMENT AND HERITAGE

SYNOPSIS

The reserves covered by these management plans conserve some of the most intact natural heritage of the western end of Kangaroo Island. The plans aim to fulfil the objectives outlined in section 37 of the *National Parks and Wildlife Act 1972* and those outlined for the wilderness code of management in the *Wilderness Protection Act 1992* (section 12).

Flinders Chase National Park was first dedicated in 1919, having been proposed by the Australian Association for the Advancement of Science as early as 1892 "for the protection of native Fauna and Flora". Kelly Hill Conservation Park was first proclaimed in 1971 to conserve the cave and karst system under Kelly Hill and the outstanding scenic attractions and vegetation of the area. Following the passing of the *Wilderness Protection Act* in 1992, parts of these two reserves were constituted as wilderness protection areas in response to recommendations of the Wilderness Advisory Committee in October 1993. These were the first wilderness protection areas in South Australia.

In combination, these reserves conserve approximately 81,878 hectares of the following environments of the western end of Kangaroo Island:

- Coastal beaches, cliffs and dune systems;
- Coastal heath, grading to coastal mallee woodland;
- Open eucalypt forest;
- Extensive karst landscapes;
- Ephemeral lakes and swamps; and
- Complete riverine systems, from catchment to marine discharge.

In keeping with the international, national, state and regional importance of the reserves, the plans principally focus on fulfilling the following major objectives:

- The preservation of wildlife and ecosystems;
- The protection of wilderness and the restoration of land to its condition prior to European colonisation; and
- The provision, utilising best practice principles, of appropriate facilities to maximise visitor experience and appreciation.

In order to fulfil these objectives, the following key actions are proposed:

1. An inventory of ecosystems and wildlife will be recorded on an electronic database, elements perceived to be under threat will be monitored, and where necessary, species or ecosystem management plans will be developed and implemented;
2. No developments are planned for the wilderness protection areas except those necessary for the preservation of wilderness values; and
3. Visitor services and infrastructure will be upgraded principally at Rocky River headquarters area and Kelly Hill headquarters area, consistent with best practice principles and biodiversity conservation.

These reserves are managed by National Parks and Wildlife SA staff, including:

- 1 District Ranger;
- 1 Senior Ranger;
- 2 Rangers;
- 1 Administrative Officer
- 3 Site Managers (Rocky River, Cape Borda and Kelly Hill visitor centres)
- 1 Senior Construction and Maintenance Officer;
- 2 Construction and Maintenance Officers and
- Up to 12 casual Construction and Maintenance Officers employed as cleaners, guides, shop attendants, etc.

These reserves are visited by up to 90,000 people per year, a large proportion of whom are not South Australian residents. Consequently, the reserves contribute significantly to the economic wellbeing of South Australia.

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1. INTRODUCTION

Flinders Chase National Park, Ravine des Casoars Wilderness Protection Area, Kelly Hill Conservation Park and Cape Bouguer Wilderness Protection Area form a complex of reserves that conserve a sample of the natural environments of the western end of Kangaroo Island. These range from undulating to low hills in the north, with laterite surface overlying metamorphic rocks that are exposed along stream courses and coastal cliffs, to an undulating calcarenite plain in the south with coastal dunes, sandstone cliffs, alluvium lakes and sandy beaches. The vegetation is predominantly low open mallee forest, with sugar gum woodland on inland sites with deeper soil.

The essentially unmodified vegetation of the reserves led to parts being the first proclaimed wilderness protection areas within South Australia under the *Wilderness Protection Act 1992*, in October 1993. These protected areas provide opportunities for visitors to enjoy natural landscapes and wildlife and provide habitat for native fauna.

This plan of management was released in draft form for public review in June 1996. At the close of the period for public consultation, eight written submissions had been received. Those comments and the draft plan were subsequently reviewed by both the Reserve Planning and Management Advisory Committee and the Wilderness Advisory Committee, resulting in a number of changes being made to the plan text. Public involvement in the planning process makes a valuable contribution to better park management and those who took the time to make representations are thanked for their efforts.

The background information included in these plans is intended to provide the reader with an overview of the natural and cultural values of the reserves and to assist in understanding the management issues and proposals. For those who have a particular interest in more detailed resource information, a companion document (*Protected Areas of Western Kangaroo Island - Background Information*) is being prepared. In addition, records and information relating to these reserves are held at the Kingscote and Flinders Chase offices of the Department for Environment, Heritage and Aboriginal Affairs and may be accessed on request.

The plans of management for Flinders Chase National Park, Ravine des Casoars Wilderness Protection Area, Kelly Hill Conservation Park and Cape Bouguer Wilderness Protection Area are now formally adopted under the provisions of Section 38 of the *National Parks and Wildlife Act 1972* and Section 31 of the *Wilderness Protection Act 1992*.

In keeping with their geographical proximity and the similar nature of the environments and management issues that pertain to the four reserves, the management plans for all four protected areas are presented as a single document. Unless otherwise specified, management objectives, strategies and prescriptions are for all these reserves. Strategies and actions are described separately where they pertain to a specific reserve or reserves.

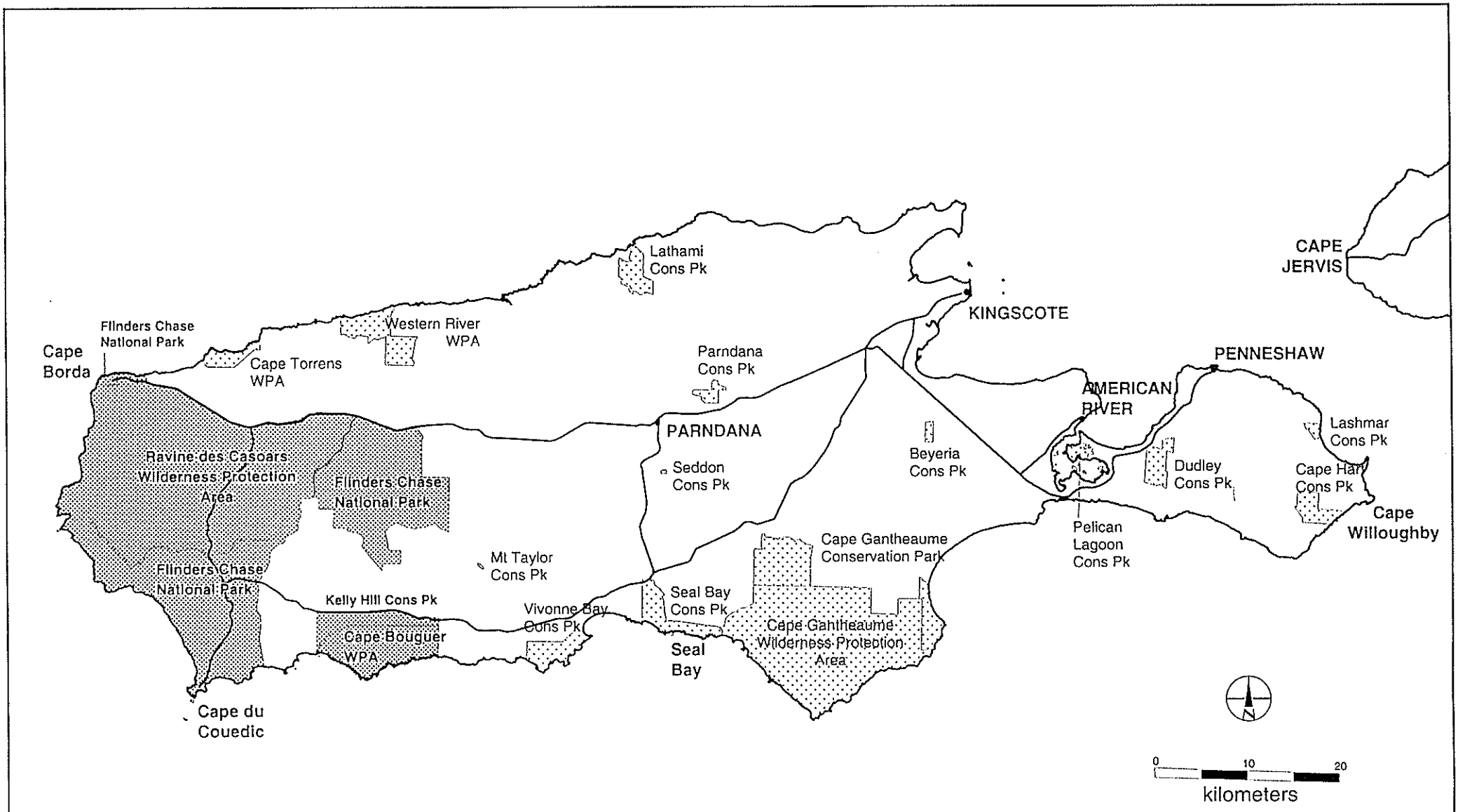

Figure 1

Reserves of Kangaroo Island

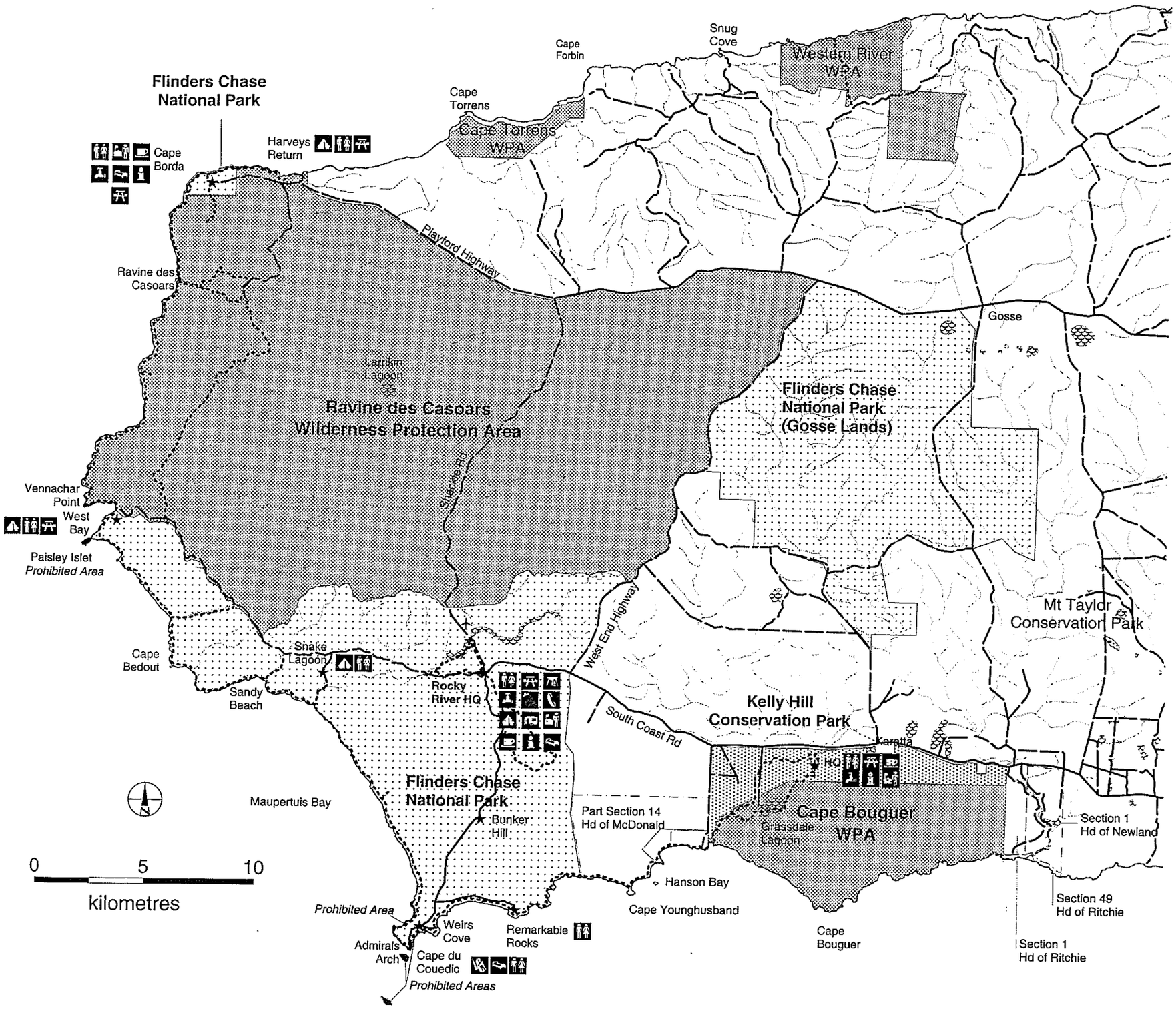

Figure 2

Flinders Chase NP
Ravine des Casoars WPA
Kelly Hill CP &
Cape Bouguer WPA

2. RESERVE DESCRIPTIONS

FLINDERS CHASE NATIONAL PARK

Flinders Chase National Park is located at the western end of Kangaroo Island (Figure 1) and is the one of the largest in a network of conserved public lands on the island. There are 22 conservation parks on the island which, together with Flinders Chase, comprise over 28 per cent of the island. Prior to the proclamation of Ravine des Casoars Wilderness Protection Area in October 1993, the total area of Flinders Chase National Park was approximately 73,100 hectares.

Flinders Chase National Park now has a total area of approximately 33,040 hectares, comprising the following: Section 18, Hundred of Borda; Sections 42, 43, 44 and 45, Hundred of Gosse; Section 21, Hundred of McDonald; Sections 42, 43, 44 and 45, Hundred of Ritchie; Sections 950 and 951, Out of Hundreds (Islands) Casuarina Islets, Allotments 51, 53, 54 and 55 in DP 38340, Allotments A, B and C in DP 27908 and Allotment 1 in FP 31869.

Since the proclamation of Ravine des Casoars Wilderness Protection Area in October 1993, Flinders Chase National Park consists of three separate parcels of land. These are:

1. Cape du Couedic: the main southern portion, between West Bay Road and the southern coast;
2. Cape Borda: the former lighthouse reserve at Cape Borda; and
3. Gosse Lands: to the east of the West End Highway.

The park is approximately 110 kilometres west of the island's largest town, Kingscote and 65 kilometres west of Parndana, the nearest town (Figure 1). Access is via the South Coast Road or via the Playford Highway and the West End Highway.

Biogeographic classification

Flinders Chase National Park is within the Kangaroo Island Environmental Region which is one of the three regions forming Province 3, the Mount Lofty Block (Laut *et al* 1977). The park contains two environmental associations:

Gantheaume Environmental Association (15%), consisting of an undulating plain on calcarenite with overlying shallow soils or coastal sand dunes covered with open mallee vegetation. Laut *et al* (1977) identified five environmental units making up this association: dominant calcarenite plain; subdominant large sand dunes; minor sandstone cliffs; alluvium lakes; and sandy beaches.

Parndana Environmental Association (85%), consisting of an undulating to low hilly laterite surface with the underlying metamorphic rocks exposed along stream courses. Lakes and cliffs occur along the coastline. The vegetation consists predominantly of low open mallee forest and sugar gum woodland. Laut *et al* (1977) identified three environmental units making up this association: dominant laterite and metamorphic slopes; minor laterite and metamorphic crests; and metamorphic cliffs.

RAVINE DES CASOARS WILDERNESS PROTECTION AREA

Ravine des Casoars Wilderness Protection Area was proclaimed in October 1993, in order to protect and preserve the outstandingly high wilderness qualities of the area. It has a total area of approximately 40,000 hectares, comprising the following sections which were formerly included in the Flinders Chase National Park: Section 11, Hundred of Borda; Section 64, Hundred of Gosse; and Allotments 50 and 52 in Deposited Plan 38340 (Figure 1).

Ravine des Casoars Wilderness Protection Area is located at the north-western end of Kangaroo Island, approximately 35 kilometres west of Parndana the nearest town and approximately 80 kilometres west of Kingscote.

Biogeographic classification

Ravine des Casoars Wilderness Protection Area is within the Kangaroo Island Environmental Region which is one of the three regions forming Province 3, the Mount Lofty Block (Laut *et al* 1977). The area contains one environmental association:

Parndana Environmental Association, consisting of an undulating to low hilly laterite surface with the underlying metamorphic rocks exposed along stream courses. Lakes and cliffs occur along the coastline. The vegetation consists predominantly of low open mallee forest and sugar gum woodland. Laut *et al* (1977) identified three environmental units making up this association: dominant laterite/metamorphic slopes; minor laterite/metamorphic crests; and metamorphic cliffs.

KELLY HILL CONSERVATION PARK

Kelly Hill Conservation Park is located 84 kilometres south-west of Kingscote on the South Coast Road of Kangaroo Island (Figure 1). The park comprises Sections 10 and 37, Hundred of Ritchie and Allotments 151 and 152 in Deposited Plan 38341 and has an area of approximately 2,180 hectares.

The park is linked with Flinders Chase National Park through an extensive area of coastal vegetation forming a belt of contiguous natural habitat (some privately owned) along the south coast of Kangaroo Island.

The South-West River runs through a previously grazed area called Grassdale which now forms the western portion of the park. Several small streams flow into the karst system, either collecting in the Grassdale lagoons within the Cape Bouguer Wilderness Protection Area, or flowing largely underground into the sea along the southern cliffs. Since Cape Bouguer Wilderness Protection Area was excised from Kelly Hill Conservation Park in October 1993, the southern boundary to the reserve is the northern boundary of the wilderness protection area.

Flinders Chase National Park combined with the Ravine des Casoars Wilderness Protection Area, the largest area of conserved remnant vegetation on the island, lies 16 kilometres west of the park and Vivonne Bay Conservation Park is 26 kilometres to the east.

Biogeographic classification

Kelly Hill Conservation Park is within the Kangaroo Island Environmental Region which is one of the three regions forming Province 3, the Mount Lofty Block (Laut *et al* 1977). The park contains one environmental association:

Gantheaume Environmental Association, consisting of an undulating plain on calcarenite with overlying shallow soils or coastal sand dunes covered with open mallee vegetation. Laut *et al* (1977) identified five environmental units making up this association: dominant calcarenite plain; subdominant large sand dunes; minor sandstone cliffs; alluvium lakes; and sandy beaches.

CAPE BOUGUER WILDERNESS PROTECTION AREA

Cape Bouguer Wilderness Protection Area was proclaimed in October, 1993, in order to protect and preserve the outstandingly high wilderness qualities of the area. It covers an area of approximately 5,000 hectares, comprising of Allotment 150 in DP 38341 and was formerly included in Kelly Hill Conservation Park (Figure 1).

Cape Bouguer Wilderness Protection Area is located 84 kilometres south-west of Kingscote on the South Coast Road of Kangaroo Island. The rugged coastline of southern Kangaroo Island, from near to the mouth of Stunsail Boom River, around Cape Bouguer to the mouth of the South-West River, forms the southern boundary of the area.

Biogeographic classification

Cape Bouguer Wilderness Protection Area is within the Kangaroo Island Environmental Region which is one of the three regions forming Province 3, the Mount Lofty Block (Laut *et al* 1977). The area contains one environmental association:

Gantheaume Environmental Association, consisting of an undulating plain on calcarenite with overlying shallow soils or coastal sand dunes covered with open mallee vegetation. Laut *et al* (1977) identified five environmental units making up this association: dominant calcarenite plain; subdominant large sand dunes; minor sandstone cliffs; alluvium lakes; and sandy beaches.

For a more detailed description of the physical and natural assets of these four reserves, refer to *Protected Areas of Western Kangaroo Island - Background Information* (DEHAA, in preparation).

3. OBJECTIVES AND MANAGEMENT

3.1. Park Management Principles

The conservation management of natural ecosystems should, as far as possible, strive to maintain biodiversity or restore ecosystems to a condition approximating that which existed prior to European settlement. In the context of this management plan, management of the natural environment will be considered successful if all of the decisions and processes strive to attain these objectives.

In 1892 the Australian Association for the Advancement of Science, in a first attempt at conserving the Flinders Chase area, unanimously resolved "that it is desirable that the western end of Kangaroo Island be reserved for the protection of native Fauna and Flora" (Dixon 1920). From the establishment of Flinders Chase National Park in 1919 until the 1950s, there was an emphasis on fauna protection, including the introduction to the park of species considered, at the time, to be under threat elsewhere in Australia.

Although the original intention of protecting native fauna and flora remains valid, there has been a shift towards conservation of ecosystems and habitats in the park. While Flinders Chase was seen as a haven for threatened animals from the mainland, more recent thinking recognises the intrinsic value for conservation of all reserves and the introduction of non-indigenous species is no longer accepted.

The conservation role of all reserves is of prime importance. Public use and enjoyment of reserves should be encouraged but it should always be compatible with the conservation of flora, fauna, wilderness values, landscape features and cultural heritage.

All four reserves convey an atmosphere of remoteness, ruggedness and isolation, qualities which should be retained and enhanced by sensitive management practices.

3.2. Legislation

Flinders Chase National Park and Kelly Hill Conservation Park are reserves declared under the *National Parks and Wildlife Act 1972*, which requires that a plan of management be prepared as soon as practicable after proclamation, setting out the strategies intended to meet the objectives set out in the Act.

Ravine des Casoars Wilderness Protection Area (formerly part of Flinders Chase National Park) and Cape Bouguer Wilderness Protection Area (formerly part of Kelly Hill Conservation Park) are reserves declared under the *Wilderness Protection Act 1992*. When all or part of a reserve declared under the *National Parks and Wildlife Act* is proclaimed as a wilderness protection area or zone under the *Wilderness Protection Act*, a new plan of management is required.

3.3. Key Management Objectives

The *National Parks and Wildlife Act 1972* stipulates the following objectives, to which management plans must have regard:

a) the preservation and management of wildlife;

b) the preservation of historic sites, objects and structures of historic or scientific interest within reserves;

c) the preservation of features of geographical, natural or scenic interest;

d) the destruction of dangerous weeds and the eradication or control of noxious weeds and exotic plants;

e) the control of vermin and exotic animals;

f) the control and eradication of disease of animals and vegetation;

g) the prevention and suppression of bush fires and other hazards;

h) the encouragement of public use and enjoyment of reserves and education in and a proper understanding and recognition of, their purpose and significance; and

i) generally the promotion of the public interest.

The *Wilderness Protection Act 1992* stipulates that plans of management for wilderness protection areas must conform with the management objectives defined in *Wilderness Protection Areas & Zones: South Australian* ***Code of Management*** (see Appendix I). The objectives of wilderness management set out in this code are:

To maximise the naturalness (ie the wilderness quality) of wilderness areas, and in particular:

(i) protect and, where practicable, enhance wilderness quality;

(ii) protect wildlife and ecological processes;

(iii) control and where practicable, eradicate non-indigenous plants and animals;

(iv) protect geographic features;

(v) protect sites of scientific significance;

(vi) protect sites of historic significance;

(vii) protect sites of Aboriginal cultural significance;

(viii) provide for public use and enjoyment where compatible with maximising wilderness quality; and

(ix) promote public awareness of and education in, the natural features of wilderness protection areas and wilderness protection zones.

The management provisions of the *National Parks and Wildlife Act 1972* and the *Wilderness Protection Act 1992* are intended to ensure that these areas will be maintained in, or restored to, as natural a condition as possible. Protecting natural systems such as those within the four reserves covered by this plan will contribute to the maintenance of biodiversity.

This document is structured so that it meets the objectives set out in both Acts. Unless otherwise specified, management provisions are for all reserves.

3.4. Planning Process

Prior to drafting management plans for a wilderness protection area or zone, the *Wilderness Protection Act* requires that a public notice be printed, inviting written submissions from the public regarding the matters that should be addressed in the plans, for a period of not less than three months. Copies of these submissions (except those made in confidence) are made available for public inspection or purchase.

An advertisement calling for planning submissions for the national park reserves and wilderness protection areas on western Kangaroo Island was placed in the media on 26 March 1994. The two submissions made in response to that call have been considered when drafting these plans.

When a plan of management, or an amended plan of management, has been prepared in draft form for a reserve constituted under the *National Parks and Wildlife Act 1972*, or a wilderness protection area or zone under the *Wilderness Protection Act 1992*, a public notice is published. The plans are placed on public examination for at least three months, during which time members of the public are invited to submit any comments or suggestions regarding the plans.

Copies of all public submissions (except those made in confidence) are available for inspection or purchase. All submissions for National Parks and Wildlife reserves are referred to the Reserves Advisory Committee and those for wilderness protection areas or zones to the Wilderness Advisory Committee. These committees may make further comments or suggestions.

The Minister, after considering all representations, may then adopt the plan of management with or without any alterations. Notice of such official adoption is published in the Government *Gazette* and copies of the plan are made available to the public.

Once a plan of management is adopted, its provisions must be carried out in relation to the reserve in question and no operations may be undertaken unless they are in accordance with the plan.

4. WILDERNESS MANAGEMENT

The main purpose of the *Wilderness Protection Act 1992* is to:

> "provide for the protection of wilderness and the restoration of land to its condition before European colonization".

The Act establishes a system to identify and protect areas of the highest ecological integrity in South Australia. That this purpose is enshrined in an Act separate from the *National Parks and Wildlife Act 1972* serves to emphasise the importance of land that is little affected by modern technological society in the conservation of natural systems and the preservation of biological diversity.

The prescriptions in the Act and its regulations are designed to protect land that meets the wilderness criteria from exploitation and development. The wilderness criteria are met if:

a) the land and its ecosystems have not been affected, or has been affected to only a minor extent, by modern technology; and

b) the land and its ecosystems have not been seriously affected by exotic animals or plants or other exotic organisms.

Although there are to be no major developments in these areas, the management philosophy is far from a "do nothing" approach, where nature can be expected to look after itself. There will be an active program aimed at preserving natural assets and processes in the reserves, while minimising or excluding detrimental external influences. Where appropriate, the wilderness quality of the areas will be enhanced by restoring the land to its state prior to European settlement.

4.1. Wilderness Management Philosophy

Several factors underpin the objectives of wilderness management:

- Ecosystem health and survival depends upon the maximisation of biological diversity.
- The impact of modern technological society has generally been to reduce diversity through habitat loss and fragmentation.
- The least disturbed ecosystems have the greatest chance of survival.
- Species free from the negative impacts of modern technological society have the best possible opportunity to evolve.

4.2. Code of Management

The *Wilderness Protection Act 1992* regulates developments within wilderness protection areas and zones and requires that they be managed according to a wilderness code of management. Section 12 of the *Wilderness Protection Act* calls for the development of a wilderness code of management, setting out policies to be implemented for the management of wilderness protection areas and zones in relation to the following:

a) the preservation of wildlife and ecosystems;
b) the restoration of land and its ecosystems to their condition before European colonization and the protection of land and its ecosystems from the effects of modern technology and exotic animals and plants and other exotic organisms;
c) the preservation of Aboriginal sites and Aboriginal objects;
d) the preservation of historic sites and objects and structures of historic or scientific interest;
e) the preservation of features of geographical, natural or scenic interest;
f) the destruction of dangerous weeds and the eradication or control of noxious weeds and exotic plants;
g) the control of vermin and exotic animals and other exotic organisms;
h) the control and eradication of disease of animals and vegetation;
i) the prevention and suppression of bush fires and other hazards;
j) the conduct of fire fighting and other emergency operations;
k) the conduct of scientific research;
l) education of the public as to the significance of wilderness protection areas and zones;
m) use of wilderness protection areas and zones by members of the public;
n) hunting in wilderness protection areas and wilderness protection zones by Aboriginal people; and
o) the entry into and the use of wilderness protection areas and zones by Aboriginal people to observe Aboriginal tradition.

Following a prescribed period for public consultation and comment by the Wilderness Advisory Committee, the *Wilderness Protection Areas & Zones: South Australian* ***Code of Management*** (Appendix I) was adopted in November 1993 and forms the basis for the management of Ravine des Casoars Wilderness Protection Area and Cape Bouguer Wilderness Protection Area.

5. ECOSYSTEM MANAGEMENT

Appropriate policies will be developed and actions taken, to ensure the conservation in perpetuity of the landscape, biodiversity and heritage of the four reserves. Biological diversity will be protected by minimising impact to wildlife habitats.

Strategies

An inventory of ecosystems, based on comprehensive surveys of biological assets will be prepared and maintained on a database with GIS capability. Populations and habitats of endangered species will be monitored and actions necessary to maintain their biological integrity will be implemented.

Actions	*Priority*	*Duration*
Initiate and maintain a database of ecosystems, including location, distribution and photograph and undertake any actions necessary to maintain their biological integrity.	High	Ongoing

5.1. Research

The need for and nature of, active ecosystem management will be based on the results of thorough research. All research will be conducted in a way that minimises long term negative impact on wilderness quality, ecosystems and biological diversity.

Strategies

Non-impacting research programs will be encouraged and a list of preferred topics for research is provided here as a guide.

Actions	*Priority*	*Duration*
Research is to be encouraged on the following topics:		
1. abundance and distribution of *Phytophthora cinnamomi*;	High	12 months
2. distribution and abundance of platypus and its impact on indigenous aquatic fauna and flora;	High	3 years
3. impact of marron on freshwater streams;	High	3 years
4. population dynamics and ecology of the Tammar wallaby; and	High	3 years
5. distribution and abundance of *Sminthopsis aitkenii*; and	High	5 years
6. population dynamics of threatened bird species, including:	High	Ongoing
a) bush stone curlew; h) southern emu-wren;		
b) western whipbird; i) hooded plover;		
c) fairy tern; j) Cape Barren goose;		
d) white-bellied sea-eagle; k) Australian bittern;		
e) osprey; l) shy heath-wren; and		
f) Bassian thrush; m) shining bronze-cuckoo.		
g) glossy black cockatoo;		

5.2. Fire

People and built assets within the reserves and on neighbouring land must be protected from fires. Fires threatening environmental assets will be managed to protect the integrity of ecosystems and for the maintenance of biological diversity.

Strategies

1. Fire management plans will be prepared for each reserve in consultation with the Kangaroo Island Bushfire Prevention Committee and the Kangaroo Island Country Fire Service Group.
2. Fire management plans will incorporate fire management zones which identify and define areas of environmental significance, built assets and areas of high visitation which require specific management objectives and prescriptions.

   Research will be undertaken into the effects of fire on all ecosystems within the park, including benchmark biological surveys and ongoing monitoring. Wherever possible, research will be undertaken in a consultative manner on a regional basis. The results of this research will be used to guide future management planning.
3. Fire management will be based on continuing research into the fire history of the area, the relationships between fire and the natural communities occurring within the area and on the maintenance of biological diversity. Fire suppression strategies should be consistent with the maintenance of biological diversity.
4. Fire management will include the restoration and rehabilitation of areas adversely impacted as a result of fire or fire suppression activities.

Actions	*Priority*	*Duration*
Implement recommendations in the relevant draft fire prevention plan while protecting the values of the reserves.	High	Ongoing
Review the effectiveness of the relevant draft fire prevention plan in the light of any wildfires which may occur in the reserves.	High	Ongoing
Prepare fire management plans for fire fighting operations in the reserves.	High	3 years
Wherever possible, undertake fire management measures to protect all stands of drooping sheoaks and aged sugar gums, the habitat of glossy black-cockatoo.	High	Ongoing
Where appropriate, undertake an inventory of flora and fauna in any area in which prescribed fuel-reduction burning is intended to be implemented and monitor and assess the impact of any such burning on flora and fauna.	High	Ongoing

5.3. Disease

Efforts will be made to keep the ecosystems of the protected areas in as healthy a state as possible. Any exotic or obviously debilitating disease of vegetation or wildlife will be assessed, monitored and if possible, eradicated.

Strategies

There is very serious concern over the discovery of the introduced, soil-borne, root rot fungus *Phytophthora cinnamomi* on Kangaroo Island. It was identified near dying vegetation at Flinders Chase National Park in the Gosse Lands. This major pathogen has the potential to destroy a wide range of species of plants.

The disease is spread primarily through the transport of soil adhering to vehicles and machinery. Secondarily, it may be transported on soil adhering to roots, footwear and animals' feet. Access to infected areas may need to be limited. Any vehicle which must enter an infected area for essential purposes should have all earth, gravel and root material thoroughly washed from it before leaving the area.

Management of the disease in the park should include the following:

1. All reserves should be thoroughly surveyed to investigate the extent of the disease within the park. Infected areas must be determined, recorded on a database and appropriately identified on the ground.
2. Appropriate management strategies need to be developed, including the management of vehicle and visitor movement into and out of the infected areas if necessary.
3. An education program should be developed to make people aware of the problem and to ensure that they comply with the management strategies.
4. Known affected sites and areas that contain susceptible vegetation should be monitored annually to assess the spread of the disease. Susceptible plants within the park include, but are not restricted to, species in the following families:

   Epacridaceae (eg *Acrotriche*)
   Fabaceae (eg *Daviesia*, *Dillwynia*, *Platylobium*, *Pultenaea trifida*);
   Mimosaceae (eg *Acacia myrtifolia*);
   Myrtaceae (eg *Eucalyptus baxteri*, *E. obliqua*, *Darwinia micropetala*);
   Proteaceae (eg *Adenanthos*, *Banksia*, *Grevillea*, *Isopogon*, *Petrophile*);
   Liliaceae (eg *Xanthorrhoea semiplana* subsp *tatei*);

Actions	*Priority*	*Duration*
Determine the distribution and impact of *Phytophthora cinnamomi* and implement an education program and management strategies to minimise its spread.	High	5 years

6. FLORA MANAGEMENT

6.1. Native Flora

Native flora in the reserves will be managed so that negative impacts are minimised and conditions which enhance the maximisation of biological diversity are maintained.

FLINDERS CHASE NATIONAL PARK AND RAVINE DES CASOARS WILDERNESS PROTECTION AREA

Strategies

1. Flinders Chase National Park features some unique ephemeral wetlands on poorly-drained parts of the lateritic plateau and slopes. Small ephemeral plants, some of which are rare or vulnerable in Australia, would be most disadvantaged by an alteration of the drainage pattern or the invasion of weeds, for example, along tracks. This includes the rare *Schoenus discifer,* late donkey orchid (*Diuris brevifolia*) and the vulnerable Kangaroo Island daisy (*Achnophora tatei*). Inappropriately constructed tracks, road drains, or other developments could disturb this unusual and delicate habitat. All earth-works should be designed to avoid impacting these areas.

2. Twining finger flower (*Cheiranthera volubilis*) is endemic to the western end of Kangaroo Island and occurs in a few locations within the park. Recently, the largest populations have been recorded immediately west of the West End Highway, but extensive searching failed to locate previously known populations (Davies 1986). The seemingly ephemeral nature of the populations suggests that the plant may be successional and require a specific fire regime to survive in the area.

   Known populations should be monitored and any newly discovered populations noted and monitored, so that the plant's ecology is better understood. This may have an important bearing on the management of wild fires in the park.

3. The only known population of island logania (*Logania insularis*) occurs in a three square kilometre patch at Cape Borda and appears to be concentrated in the square kilometre west of the lighthouse, in the former lighthouse reserve. It is considered vulnerable by Davies (1986). The population should be monitored and any impacts should be avoided.

4. Given the unusual fire history of Kangaroo Island and the numbers of endemic plant species, any fuel-reduction burning should be based on scientific evidence, particularly in the context of the long-term impacts on floral components of the ecosystem. Before any fuel-reduction burning takes place, research should be undertaken. The potential effects of burning on those ecosystems should be assessed and monitoring programs developed to determine long-term impacts.

5. There is a high degree of endemism on the western end of Kangaroo Island. The fact that Flinders Chase National Park contains more than 30 plant species which are classified by Leigh *et al* (1981) as rare or threatened in Australia is due not only to the biogeographical uniqueness of the region, but also to the relatively undisturbed condition of the park. Plants of known conservation significance in Flinders Chase National Park are listed in a table as Appendix II.

6. Power for the Cape du Couedic area is transmitted by single wire earth return (SWER) overhead cable from Rocky River headquarters area. Managing the easement to maintain the SWER cable impacts considerably on the vegetation.

   In consultation with the Australian Maritime Safety Authority (AMSA), an alternative

power source should be developed for the facilities at Cape du Couedic. The SWER power line from Rocky River to Cape du Couedic should be removed and the easement allowed to regenerate.

Actions	*Priority*	*Duration*
Record and enter on a database the location and distribution of threatened plant species, including *Schoenus discifer*, late donkey orchid, Kangaroo Island daisy, twining finger flower and island logania.	High	3 years
In consultation with AMSA, develop an alternative power source for the facilities at Cape du Couedic, remove SWER power line and rehabilitate the easement.	High	5 years

KELLY HILL CONSERVATION PARK

Strategies

1. Four rare Australian plant species are known to occur in the park, namely:
   - *Schoenus discifer* and *Achnophora tatei* which occur on the muddy flats in the vicinity of lagoons;
   - *Acrotriche halmaturina* on isolated pockets of lateritic soil; and
   - Port Lincoln gum (*Eucalyptus landsdowneana* ssp *albopurpurea*).

   Their status in the park should be assessed and monitored and any developments which may disturb their habitat avoided.

2. The vegetation association of broombush (*Melaleuca uncinata*), cup gum (*Eucalyptus cosmophylla*) and coastal white mallee (*Eucalyptus diversifola*) occurs in a narrow strip along the northern boundary of the park and is the only example of this vegetation type conserved on the western end of Kangaroo Island. Developments in this area are to be avoided.

3. Power for Grassdale Cottage is by single wire earth return (SWER) power line, which traverses an easement from South Coast Road through natural vegetation. An alternative power source should be sought for Grassdale so that the SWER easement may be rehabilitated.

Actions	*Priority*	*Duration*
Record and enter on a database the location and distribution of threatened plant species.	High	3 years
Develop an alternative power source for facilities at Grassdale, so that the SWER power line to the area may be removed and the easement rehabilitated.	High	3 years

CAPE BOUGUER WILDERNESS PROTECTION AREA

Strategies

There is a high degree of endemism on the western end of Kangaroo Island. The fact that Cape Bouguer Wilderness Protection Area contains many plant species which are classified by Leigh *et al* (1981) as rare or threatened in Australia is due not only to the biogeographical uniqueness of the region, but also to the relatively undisturbed condition of the area.

The general policy of preventing disturbance in this area should be maintained to protect the integrity of the ecosystems and the rare and threatened species.

Action	*Priority*	*Duration*
Record and enter on a database the location and distribution of threatened plant species.	High	3 years

6.2. Exotic Flora

Exotic plants usually reduce the biological diversity of natural ecosystems. Consequently, strategies will be implemented which are designed to prevent their introduction, reduce their spread and, if possible, eradicate them from the reserves.

Strategies

A district weed management plan will be developed and an integrated approach to exotic plant control will be taken. In particular, the plan will address the control and/or eradication of the following weeds:

bridle creeper (*Myrsiphyllum asparagoides*)

The distribution of the scheduled pest plant bridle creeper should be very carefully monitored and the current eradication program should continue;

salvation Jane (*Echium plantagineum*.)

Salvation Jane occurs within the Cape Borda lighthouse area and subsequently requires careful monitoring and ongoing control with the objective of eradication;

variegated thistle (*Silybum marianum*)

Variegated thistle occurs in disturbed areas and requires control so that native grasses may replace it;

stinging nettles (*Urtica urens*)

Stinging nettles were introduced in contaminated hay used to feed kangaroos and have become established in disturbed sites on organic soil. Hay is no longer imported for kangaroos, but the nettles should be eradicated;

cape weed (*Arctotheca calendula*)

Cape weed has become established from seed in rubble from borrow pits used in road repairs and should be eradicated. Future roadworks involving the carting of materials should be monitored to avoid further introductions of weed species.

pasture weeds

Pasture plants such as clover (*Trifolium* sp.) and mignonette (*Reseda luteola*) have appeared along the routes once used by camel trek parties. Camel treks are no longer permitted within the park, but the routes once used by them should be periodically assessed to monitor the abundance of these weeds and appropriate control measures undertaken.

Although there are few other introduced species in the reserves that are considered to be particular problems, the distribution and abundance of any potential weeds should be monitored in order to detect any change in their status. All weed control programs should be in accordance with the District Weed Management Plan as part of an integrated approach to pest plant management.

Actions	*Priority*	*Duration*
Prepare an integrated district pest plant management plan that identifies weed infestations and potential infestations, both in and out of reserves and addresses their control and/or eradication.	High	12 months
Monitor and continue to eradicate bridle creeper, salvation jane, variegated thistle, stinging nettle, cape weed, clover and mignonette.	High	Ongoing

7. FAUNA MANAGEMENT

7.1. Native Fauna

Native fauna in the reserves will be managed so that negative impacts are minimised and conditions which enhance the maximisation of biological diversity are maintained.

7.1.1. Mammals

The management of fauna should be based on the best available information of populations and ecosystems. Animal populations should be carefully surveyed and monitored and information recorded on a database with GIS capability in order to facilitate the development of species management plans as necessary.

Strategies

1. Tammar wallaby (*Macropus eugenii*) Rare

   Tammar wallaby is scheduled as "rare" in the *National Parks and Wildlife Act 1972* because the mainland populations have been decimated, however they are abundant and widespread on Kangaroo Island. Landowners are issued destruction permits to minimise the impact of these animals on grazing pastures. Despite the seemingly elevated population numbers near to cleared land and available pasture, the population suffers periodic declines for reasons which are not yet clear.

   Continued research on this and other aspects of the species' ecology should be encouraged and a species management plan developed, so that future management of Tammar wallaby both on and off the reserves is scientifically based.

2. platypus (*Ornithorhynchus anatinus*) Vulnerable

   In 1921, two males and a female were introduced into the Rocky River from Wynyard in Tasmania and in 1941 a further five pairs were released into the same river. Six additional pairs were released into the Breakneck River in 1946. It may be significant that these platypus have been genetically isolated for more than 50 years in marginal intermittent aquatic habitats, in ecosystems that are relatively intact and free from predator pressure. In addition they have become important ecotourism assets.

   Since their introduction, platypus have been recorded in South West River within Kelly Hill Conservation Park and Cape Bouguer Wilderness Protection Area and Stunsail Boom River near the eastern boundary of Kelly Hill Conservation Park and have spread to other watercourses in the reserves. In drought conditions, platypus has been observed some distance from shrinking water-holes, presumably in search of new, unoccupied territory.

   The impact of the platypus on the indigenous aquatic fauna and flora is unknown and research into this matter is to be encouraged. In addition, animals from this naturalised population have in the past been indiscriminately taken into captivity with no regard for the ecological impacts. Consequently, until appropriate research has been undertaken there should be no further reductions or introductions of platypus in the reserves.

3. koala (*Phascolarctos cinereus*)

   During the early 1920s 18 adult koalas were introduced to Flinders Chase National Park on Kangaroo Island from French Island in Victoria. These koalas were disease-free and prospered. Some were later relocated to other areas on Kangaroo Island, such as the Cygnet River valley in the late 1950s and early 1960s. Koalas are now spread across much of the Island and occupy all riverine habitats where suitable tree species are found. The population on the Island is in excess of 5000 koalas with densities of up to 7 koalas per hectare in some places.

While such a successful introduction program has been beneficial for the species, the effect on vegetation in the reserves must be viewed with great concern. The koala's preferred food on the island, rough-barked manna gum (*Eucalyptus viminalis* ssp. *cygnetensis*), swamp gum (*Eucalyptus ovata*) and South Australian blue gum (*Eucalyptus leucoxylon*), occur in small, discrete patches along the largest creek systems, principally along Rocky River within Flinders Chase National Park and Ravine des Casoars Wilderness Protection Area. In those areas to which koalas have been introduced, or have voluntarily dispersed, severe defoliation of trees is occurring, particularly rough-barked manna gums.

Koalas have also been observed in habitats containing relatively unpalatable trees, such as stringy-bark, coastal mallee and narrow leaved mallee. Koalas in these habitats may suffer from lack of suitable food reducing their chances of survival.

A number of management strategies have been attempted in the past, including:

a) relocation of part of the koala population to an appropriate mainland sanctuary;
b) prevention of access to the canopy of individual trees by means of a "collar" of sheet iron around the lower trunk; and
c) planting of a stand of rough-barked manna gums near park headquarters to provide an additional, managed food source.

These methods individually have not provided adequate long-term protection for trees under current browsing pressure. The ensuing crisis of habitat loss led to the establishment of the Koala Management Task Force in April 1996 to investigate the issues and provide recommendations on koala management in South Australia.

A koala management program was established in 1996 to implement strategies to minimise impact to fragile ecosystems while maintaining the integrity of the population for tourism purposes. Strategies included sterilising animals to reduce reproduction, translocating animals to the south-east of the State, habitat restoration and revegetation.

Actions	*Priority*	*Duration*
Initiate and maintain a database of threatened species and significant wildlife sightings, including location, distribution and photograph and undertake any actions necessary to maintain their biological integrity.	High	Ongoing
Revegetate the area identified in the Rocky River Draft Master Plan with a range of local overstorey and understorey species, including *Eucalyptus viminalis* ssp. *cygnetensis* as food trees for koala.	High	3 years
Initiate research into the biology of Tammar wallabies and prepare and implement a species management plan.	Medium	10 years
Prepare and implement a koala species management plan.	Medium	5 years
a) Develop a policy governing the transfer of live platypus from Kangaroo Island including conditions under which transfers may take place and the establishment of application and permit fees to defray costs of assessing transfer applications and a research/education contribution,	a) Medium	10 years
b) Prepare a species management plan for platypus incorporating a policy governing the transfer of live platypus and	b) Low	10 years
c) Initiate and encourage research into the abundance and distribution of platypus, the availability of habitat under conditions of maximum and minimum flow and the impact of the platypus on indigenous aquatic fauna and flora.	c) Low	10 years

FLINDERS CHASE NATIONAL PARK, RAVINE DES CASOARS WILDERNESS PROTECTION AREA AND CAPE BOUGUER WILDERNESS PROTECTION AREA.

Strategies

New Zealand fur-seal (*Arctocephalus forsteri*)

New Zealand fur-seals are often seen hauling out around the coast of Kangaroo Island and are known to breed at Cape du Couedic and Cape Gantheaume. The New Zealand fur-seal population in the Cape du Couedic/Casuarina Islets area within Flinders Chase National Park is one of the largest in South Australia. (Robinson *et al* 1996). Regular monitoring should be undertaken to establish age structure and population size and dynamics. Dr. Peter Shaugnessey of the CSIRO Division of Wildlife and Ecology is currently undertaking a marked re-capture research program of the population at Cape du Couedic. This project should be encouraged and continue to receive the support of DEHAA management and staff.

Prohibited areas under section 42 of the *National Parks and Wildlife Act* have been proclaimed over breeding sites at Casuarina Islets, Nautilus Rock, Nautilus North and The Ladders and over haul-out areas near Admirals Arch at Cape du Couedic to minimise disturbance by excluding visitors. Restricted access to these areas should continue to be enforced.

Actions	*Priority*	*Duration*
a) Record (including photograph) and enter on a database, the locations of haul-out areas and breeding colonies of New Zealand fur-seals, Australian fur-seals and Australian sea lions;	High	12 months
b) Regularly monitor populations; and	High	Ongoing
c) Prepare and implement species management plans.	Low	5 years

FLINDERS CHASE NATIONAL PARK AND KELLY HILL CONSERVATION PARK

Strategies

western grey kangaroo (*Macropus fuliginosus fuliginosus*).

Flinders Chase National Park and Kelly Hill Conservation Park were dedicated to conserve a significant area of pristine ecosystems and diverse wildlife habitats. The casual feeding of animals by visitors in these parks is at odds with this purpose. Supplementary feeding has led to kangaroos developing significant behavioural and biological problems. These include:

- an unnaturally high population;
- dependence on introduced food;
- aggressive social behaviour; and
- health problems (eg digestive disorders, “lumpy jaw” and general poor condition).

In accordance with management philosophy, supplementary feeding of kangaroos is to be actively discouraged.

Action	*Priority*	*Duration*
Prepare and implement a plan to phase out the feeding of animals.	High	12 months

7.1.2. Birds

The management of bird species within the reserves should be based on a thorough understanding of their population dynamics. A comprehensive database should be developed and maintained of all bird species, including where appropriate, fixed, long-term monitoring in a range of habitats.

Strategies

Of the avifauna in the reserves, the following species in particular require management attention:

1. glossy black cockatoo (*Calyptorhynchus lathami*) Endangered
   The Kangaroo Island population of the glossy black cockatoo is very low. The birds are dependent on mature drooping sheoaks (*Allocasuarina verticillata*) for food. Small stands of this tree occur at Harveys Return, West Bay and in the major creek lines on the west coast. However, many of these are regenerating after a fire and are too immature to support the glossy black cockatoos.

   Furthermore, nesting sites are predominantly restricted to hollows in aged sugar gums (*Eucalyptus cladocalyx*). The distribution of sugar gums is restricted to the higher rainfall areas on the island, mainly along gullies in the north west. These hollows are also utilised by feral bees and more recently by nesting corellas and galahs, all of which impact on the viability of glossy black cockatoos.

   A Glossy Black Rescue Fund was established in 1993 following a successful fund-raising drive and significant funding from Environment Australia's Endangered Species Program grants. This led to the creation of the Glossy Black Rescue Team, which has been undertaking research and implementing management strategies to preserve the species.

   Fire should be precluded from the habitat of the glossy black cockatoo until an appropriate research program has been undertaken. A species management plan may then be implemented, based on scientific knowledge and best practice.

2. white-bellied sea-eagle (*Haliaeetus leucogaster*) Vulnerable
   The white-bellied sea-eagle is a threatened species in coastal South Australia, but the long, undisturbed coastline of the reserves of western Kangaroo Island provides an extensive refuge for the species. The locations of several nests are known in the area and they are unlikely to attract much human interference. However, future developments which could increase the level of human disturbance to the white-bellied sea-eagle's breeding habitat will be avoided. A distribution study to locate all nests in the area should be undertaken so that impacts may be avoided.

3. osprey (*Pandion haliaetus*)
   Although not scheduled as a rare species, the distribution of the osprey in South Australia is very similar to that of the white-bellied sea-eagle. Like the latter species, ospreys usually nest on coastal cliffs and although it is probable that several pairs breed in the park, only one nest is known in Flinders Chase National Park. A survey should be undertaken to assess the distribution of this species and impacts to nesting sites avoided.

4. bush stone-curlew (*Burhinus grallarius*) Endangered
   The bush stone-curlew is a threatened species on mainland South Australia, but is common on Kangaroo Island. A small number of birds are resident in the reserves. The birds appear to prefer pasture surrounded by scrub and the maintenance of this habitat type around Rocky River headquarters should help to ensure a healthy population within the park. Regular monitoring of the population should be undertaken.

5. Australasian bittern (*Botaurus poiciloptilus*) Vulnerable
   Considered threatened in Australia, the Australasian bittern has been recorded only once in Flinders Chase National Park. New records of the species would be very significant and should be recorded. If present, populations should be monitored.

6. shy heath-wren (*Hylacola cauta*) Vulnerable
   Vulnerable to extinction in South Australia, the secretive habits of shy heath-wrens make them a rare sight in the reserves, however their distinctive song is commonly heard. Their conservation status should be determined and if necessary, a species management plan should be developed and implemented.

7. Bassian thrush (*Zoothera lunulata*) Rare
   The Bassian thrush is an uncommon and possibly endangered isolate on the adjacent mainland, although it is moderately common in the reserves. However, a potential threat to this species is an introduced thrush, the blackbird (*Turdus merula*), which probably competes with it for the same habitat: that is, dense shrub stratum with an open groundcover amongst which the birds forage.

   The numbers of both species should be carefully monitored to gain an understanding of the interaction between them. Should it appear that the blackbird population is increasing at the expense of the Bassian thrush, a program to remove blackbirds should be designed and implemented.

8. shining bronze-cuckoo (*Chrysococcyx lucidus*) Rare
   This migrant from the Solomon Islands and the Bismark Archipelago visits the reserves during spring and summer and is considered vulnerable in South Australia. The population should be monitored and if necessary, a species management plan should be developed and implemented.

9. hooded plover (*Thinornis rubricollis*) Vulnerable
   The hooded plover (or dotterel) utilises beach habitats and should be protected from disturbance during breeding seasons.

Birds in the following table have conservation status and populations should be monitored regularly so that threats may be identified and impacts avoided.

Species		**Status**
Coturnix ypsilophora	swamp quail	vulnerable
Emblema bellum	beautiful firetail	vulnerable
Falco peregrinus macropus	peregrine falcon	vulnerable
Gallinago hardwickii	Latham's snipe	vulnerable
Lichenostromus cratitius	purple-gaped honeyeater	vulnerable
Neophema elegans	elegant parrot	indeterminate
Pardalotus xanthopygus	yellow-rump pardalote	vulnerable
Psophodes nigrogularis	Western whipbird	unknown
Rallus pectoralis	Lewin's rail	vulnerable
Rostratula benghalensis	painted snipe	vulnerable
Stictonetta naevosa	freckled duck	vulnerable
Stipiturus malachurus	southern emu-wren	vulnerable
Turnix varia	painted button-quail	vulnerable

Actions	*Priority*	*Duration*
Establish fixed, long-term monitoring points to observe and record in a database, bird species within the reserves, from a range of habitats.	High	12 months
Wherever possible, undertake fire management measures to protect all stands of drooping sheoaks and sugar gums, the habitat of glossy black cockatoo.	High	Ongoing
a) The distribution and abundance of threatened bird species should be determined,	High	5 years
b) research into their population dynamics should be initiated and	High	Ongoing
c) where necessary, species management plans should be prepared and implemented.	High	Ongoing
d) In particular, potential disturbance of nests of the white-bellied sea-eagle and osprey should continue to be monitored and	Medium	Ongoing
e) species management plans should be prepared and implemented for both birds.	Medium	10 years

FLINDERS CHASE NATIONAL PARK

Strategies

1. Cape Barren goose (*Cereopsis novaehollandiae*) Vulnerable

   The Cape Barren goose was introduced to Flinders Chase National Park in small numbers in the 1920s and 1930s. Since then the population has grown steadily to the stage where local landholders have from time to time requested permits to destroy geese which feed on their pasture in summer. However, it appears that the population in the park has stabilised in recent years, probably being limited by the availability of suitable breeding grounds. Black Swamp and the wet pasture at park headquarters are favoured sites.

   A species management plan should be developed for the Cape Barren goose, based on information from a detailed study of its population size, breeding rate, nesting habitat requirements and post-breeding dispersal patterns.

2. fairy tern (*Sterna nereis*) Vulnerable

   Fairy tern breed on Paisley Island, West Bay. This site has been declared a prohibited area under section 42 of the *National Parks and Wildlife Act* to protect this species from undue human disturbance. Restricted access to this area should continue to be enforced.

Non-indigenous Australian species which were released in the park earlier this century such as the emu (*Dromaius novohollandiae*), brush turkey (*Alectura lathami*) and gang-gang cockatoo (*Calocephalon fimbriatum*) should be retained, but their populations should not be supplemented.

Actions	*Priority*	*Duration*
Prepare and implement a species management plan for Cape Barren geese.	Medium	10 years

7.1.3. Reptiles

Strategies

Rosenberg's goanna (*Varanus gouldii rosenbergi*)

Rosenberg's goanna is common on the island, but little is known about its behaviour or

reproductive biology. Dr. Brian Green of the CSIRO Division of Wildlife and Ecology is continuing research and monitoring of the population within Flinders Chase National Park in the vicinity of the Rocky River headquarters area. This project should be encouraged and receive the support of DEHAA management and staff.

7.1.4. Invertebrates

Strategies

Of the 97 species of butterfly recognised within South Australia, 26 are known to be on Kangaroo Island and about six or so additional species are likely to occur there. Populations of these species and their known habitats should be assessed, recorded on a database with GIS capability and monitored so that impacts to them are avoided or minimised.

Butterfly species are put at risk by collectors. Collecting of butterflies by lepidopterists is strictly prohibited, unless authorised by the Director, National Parks and Wildlife, for legitimate scientific research.

The following species of conservation significance are listed with their known preferred food plants:

Species	**Preferred food plant(s)**	**Comment**	**Status**
Hesperilla chrysostricha leucosia		Avoid disturbance of swampy areas.	Vulnerable
Hesperilla idothea clara		Avoid disturbance of swampy areas.	Vulnerable
Motasingha trimaculata trimaculata	*Gahnia deusta, G filum, G sieberiana, G trifida*		Rare
Antipodia atralba	*Gahnia clarkei, G sieberiana, G trifida*	Recorded at Seal Bay and Vivonne Bay, but may be in swampy areas of Flinders Chase. Avoid disturbance of swampy areas.	Rare
Delias aganippe	*Amyema melaleucae, A miquellii, A preissii, Exocarpos cupressiformis, E strictus, Santalum acuminatum*		Rare
Ogyris idmio halmaturina	Entire larval stage spent in sugar ant (*Campanotus* spp., including *C nigriceps* and *C terebrans*) nests, at the base of mallee trees (esp. *Eucalyptus viridans*). Larvae thought to feed on immature ant larvae.	Location of colonies should be recorded on database and monitored.	Endangered
Ogyris otanes	*Choretrum glomeratum* and dwell in symbiosis with sugar ants (*Campanotus* spp.) at the base of shrubs in sandy mallee areas.	Location of colonies should be recorded on database and monitored.	Vulnerable
Theclinestes miskini miskini	*Acacia* spp., including *A anceps, A pycnantha, A victoriae.*		Rare

7.2. Feral and Introduced Fauna

Wild non-Australian animals have no place in parks. Consequently, efforts will be made to prevent their introduction and control and eradicate those present if possible.

In the past, Flinders Chase National Park was used as a refuge for species of animals considered under threat on the mainland. This is no longer seen as appropriate and no further introductions of non-indigenous Australian animals are contemplated.

7.2.1. Mammals

Strategies

goat (*Capra hircus*)

Feral goats have been on the island since their introduction by the earliest European visitors. It was common practice in the early days of sea travel to allow goats and pigs to colonise islands, in order to provide future meat for ships' crews. Goats remain in coastal and river-flat habitats in the reserves, despite the destruction of numerous animals in the past. They severely defoliate and trample vegetation. The current eradication program should be continued. Monitoring the distribution, movement and habits of goats in the reserves will greatly facilitate the development of an effective regional control program.

pig (*Sus scrofa*)

Although pigs were amongst the earliest introductions of feral animals on islands in the days of sailing vessels, the pigs which infest Kangaroo Island are the progeny of domestic animals that strayed after European settlement. Feral pigs impact on native habitat, particularly along river flats. Their effect on vegetation, particularly rare annual and small perennial species, is severe. Soil erosion occurs when winter rains wash over the upturned earth where they have been feeding. Successful strategies, including trapping, have been developed to control pigs and a regional approach, including these strategies, will continue.

cat (*Felis catus*)

Ideally, feral cats should be eradicated from the reserves. This will only be achieved if cats are also significantly controlled in the surrounding district. A regional approach involving local landowners and DEHAA staff to control cats will continue to be undertaken.

Actions	*Priority*	*Duration*
Prepare and implement a pest animal management plan for the control and if possible, eradication of pigs, goats and cats from all reserves.	High	12 months

7.2.2. Birds

Strategies

1. blackbird (*Turdus merula*)

   The blackbird, a thrush, potentially competes for habitat resources with the Bassian thrush. If blackbird numbers increase, research will need to be undertaken to determine the impact and appropriate control strategies designed and implemented.

2. starling (*Sturnus vulgaris*)

   Starlings, although still in low numbers in the reserves, occur in thousands in nearby coastal areas on the mainland and therefore should be regarded as a potential threat to biological integrity. They breed in tree hollows and cliff holes, thereby competing with native parrots which have similar nesting requirements. The starling population should be closely monitored and control measures aimed at eradication should be implemented.

Actions	*Priority*	*Duration*
Monitor blackbird and starling populations and implement appropriate control measures.	Medium	Ongoing

KELLY HILL CONSERVATION PARK

Strategies

house sparrow (*Passer domesticus*)

A small breeding population of house sparrows is established around the fire shed at park headquarters. Although it appears that their impact on native avifauna is probably minimal at present, their numbers should be controlled in order to prevent their spread elsewhere in the park.

Actions	*Priority*	*Duration*
Monitor house sparrow population and implement appropriate control measures.	Medium	Ongoing

7.2.3. Invertebrates

Strategies

honey bee (*Apis mellifera*)

Kangaroo Island was declared a Ligurian Bee Sanctuary (1885) before Flinders Chase became a wildlife sanctuary (1919). In fact, it is the world's oldest bee sanctuary. The Ligurian strain of honey bee (*Apis mellifera ligustica*) is famous as a docile and productive animal and the importance of the sanctuary is borne out by the fact that Kangaroo Island is now the only place in the world with a pure and disease-free population. Since introduction, Ligurian bees have established naturalised colonies throughout the island, principally in or near naturally vegetated sites. Their disease-free status has been protected since 1993 by a Government embargo on all bee goods coming into Kangaroo Island.

Historically, several sites within Flinders Chase National Park were utilized as Government bee farms and later were leased to apiarists. These sites are no longer in use and lapsed leases have not been renewed despite the international importance of Ligurian bees and the local demand for sites.

The naturalisation of bees on the island has had an impact on wildlife. To argue that they compete for a food resource with native animals, including insects, is as yet

unproven or at least little understood. However, their preference for establishing colonies in the hollow limbs of aged trees brings them into direct competition with several species and in particular the endangered glossy black cockatoo.

For this reason, Kangaroo Island Beekeepers Association is working in conjunction with the Glossy Black Rescue Team (see p 20) in a 10 year project to trap feral bee swarms in nesting areas of the glossy black cockatoo. Efforts should continue to be made to eradicate feral breeding colonies of honey bees and to prevent the establishment of new feral colonies wherever possible.

marron (*Cherax tenuimanus*)

This Western Australian crustacean was introduced to rivers on the island and is farmed in dams on some properties. Research into the status of marron in the reserves and its impact on freshwater ecosystems should be encouraged. The prohibition on further introductions of marron to watercourses in the reserves will be strictly enforced. A permit system for the removal of marron within the reserves should continue to be enforced to assist with monitoring of the population and minimising the impact of poachers.

Actions	*Priority*	*Duration*
Continue to eradicate feral bee colonies from the reserves in collaboration with commercial apiarists.	High	Ongoing
Assess and monitor impact of marron on freshwater streams.	Medium	Ongoing
Establish a permit system for the removal of marron from the reserves.	High	12 months

8. GEOLOGICAL RESOURCE MANAGEMENT

8.1. Geology

Strategies

Geographic names

Any names of sites and features in the reserves that may cause confusion should be reviewed and recommendations made to the Geographical Names Board of South Australia for appropriate changes. There are unnamed creeks and other features for which names are needed for improved reference purposes. It is proposed that field staff or other interested individuals submit appropriate names for these features for approval by the Geographical Names Board.

Actions	*Priority*	*Duration*
Identify unnamed features in the area and submit recommended names to the Geographical Names Board.	Medium	5 years
Review the need for name changes where present names cause confusion and submit recommendations as appropriate to the Geographical Names Board	Medium	5 years

FLINDERS CHASE NATIONAL PARK

Strategies

a) The following sites in the park are listed in the fifth volume of *Geological Monuments in South Australia* (Geological Society of Australia SA Division 1984):
   Remarkable Rocks
   Cape du Couedic and Admirals Arch

   These are among the main scenic attractions on Kangaroo Island and are therefore subject to high visitor use. Other significant geological exposures are well protected along the inaccessible coastline. Efforts should continue to ensure that these sites are not defaced or damaged in any way. The interpretation plan should allow for some on-site interpretation of geological features at Remarkable Rocks and Admirals Arch.

   The recently constructed boardwalk to Admirals Arch at Cape du Couedic has proved itself to be beneficial in several ways. Visitor safety has improved, impacts to vegetation and the geological structures have been virtually removed and the fur-seals are subject to less disturbance, so that they now occupy rocks adjacent to the boardwalk, giving visitors an intimate view of their behaviour.

   It is proposed that a boardwalk be constructed from the new car park site at Remarkable Rocks to that feature, incorporating a viewing platform with access for disabled visitors.

b) The park headquarters are referred to as Rocky River headquarters after the name of the river and old homestead. To the west of the headquarters is an area generally known as the Rocky River picnic area. North of the headquarters is a camping and picnic site and an area for viewing platypus referred to as Rocky River Water-hole. As there is potential for some confusion in these names it is proposed that they be reviewed and, if necessary, recommendations made to the Geographical Names Board to adopt more appropriate place names.

   There are unnamed creeks and other features for which names are needed for improved reference purposes. It is proposed that field staff or other interested individuals submit appropriate names for these features for approval by the Geographical Names Board.

Actions	*Priority*	*Duration*
Construct an unobtrusive raised boardwalk and viewing platform with disabled access from the new car park site to Remarkable Rocks.	High	5 years
Identify unnamed features in the park and submit recommendations to the Geographical Names Board for their naming.	Medium	5 years
Review the need for name changes where present names cause confusion and submit recommendations as appropriate to the Geographical Names Board	Medium	5 years

KELLY HILL CONSERVATION PARK

Caves and associated karst features of Kelly Hill Conservation Park will be protected, while allowing visitors to experience and appreciate the cave environment.

Strategies

The main water supply for the visitor centre and staff residence is a dam to the west of the residence. This dam is fed by a diversion from the stream that naturally enters the cave system. The effect of this diversion on the karst system is unknown.

A study must be instituted as soon as possible to investigate the hydrology of the caves. The results of this study will determine if an alternative water supply is needed. In the interim, apart from scraping accumulated mud and debris from the dam, no extensions or new water storages can be placed on the stream to the cave.

The nomenclature of existing caves is in accordance with a state classification system consisting of the letter designator "K" followed by a sequential number in chronological order of discovery. All future cave discoveries are to be classified in accordance with this system.

Names of caverns used in the show caves system need to be renamed in accordance with the names of the caverns used in their initial discovery in 1895. Other unnamed caverns should be named to identify their geographical position and to avoid confusion.

Appropriate names need to be provided for the lagoons at Grassdale.

There are unnamed creeks and other features for which names are needed for improved reference purposes. It is proposed that field staff or other interested people submit appropriate names for these features for approval by the Geographical Names Board.

Actions	*Priority*	*Duration*
Initiate research into the hydrology of the main caves and implement recommendations with regard to the water supply to the staff residence and visitor centre.	High	3 years
Rename the show cave caverns so that they reflect the names applied to them at the time of their initial discovery in the late 19th century.	Medium	5 years

8.2. Soils

FLINDERS CHASE NATIONAL PARK

Strategies

The inland areas are generally well vegetated and the coastal cliffs still have a protective cover of heath vegetation. Overall, there are few erosion and salinity problems in the park; however there are some specific soil erosion problems that will be addressed. These include:

1. gullying from excessive run-off at the Rocky River airstrip;
2. erosion on Admirals Arch walking trail at Cape du Couedic; and
3. sand dune degradation at West Bay.

Actions	*Priority*	*Duration*
Rehabilitate eroded areas to the south of the airstrip and control run-off to prevent further erosion.	High	3 years
Replace existing eroded and compacted limestone path to Admirals Arch with a more appropriate structure.	High	5 years
Rehabilitate degraded sand dune at West Bay, hardening walking trail where necessary to prevent further erosion.	High	3 years

RAVINE DES CASOARS WILDERNESS PROTECTION AREA

Strategies

1. The walking trail from the campsite at Harveys Return to the historic landing site is in poor condition and needs to be upgraded to repair erosion, preserve historic integrity and to improve visitor safety.
2. Run-off from the Rocky River airstrip has caused some gully erosion both to the north and the south of the airstrip and this extends into the wilderness protection area.
3. The walking trail to the Bullock Waterhole on Shackle Road is also an impacted area. Despite being within the 20 metre fire break along Shackle Road, this is an ideal site for interpreting wilderness values for visitors. The degraded sections of the trail should be repaired, hardening where necessary to limit future impacts. An unobtrusive sign interpreting its history should be erected near the site.

Actions	*Priority*	*Duration*
Repair the walking trail from the campground to the landing site at Harveys Return, improving drainage to minimise erosion.	High	3 years
Rehabilitate eroded areas to the north and south of the airstrip and control run-off to prevent further erosion.	High	3 years
Repair the walking trail to Bullock Waterhole from Shackle Road, hardening sections where necessary.	High	12 months

CAPE BOUGUER WILDERNESS PROTECTION AREA

Strategies

Near the South-West River mouth, the frontal dune has blown out and sand from the blowout is shifting into the South-West River. It is uncertain whether this results from natural causes or from human causes. It appears, however, that any natural restoration is prevented due to the blowout being used as pedestrian access between the beach and the river lagoon.

The blowout hollow and surrounds should be fenced and dune grasses established. Introduced grasses should not be used and every attempt should be made to establish the native *Spinifex sericeus* in the blowout area. A temporary board-walk or controlled access walkway should be provided across the dune to allow access to the swimming hole in the river until rehabilitation is complete.

Actions	*Priority*	*Duration*
Construct a temporary boardwalk between the beaches at Hanson Bay and establish rehabilitation measures to the dune blowout at the mouth of South West River.	Medium	12 months

8.3. Karst Systems

Strategies

Kelly Hill Conservation Park and Cape Bouguer Wilderness Protection Area contain a significant aeolianite karst landscape containing an extensive cave system.

Along the west coast of Ravine des Casoars Wilderness Protection Area and the south coast of Flinders Chase National Park, calcarenite karst environments extend to approximately a kilometre inland. Numerous coastal and inland caves occur in this area, including the coastal cave at the mouth of Ravine des Casoars River, Possum Skin Cave near Cape Borda and West Bay Hollow south of West Bay.

An inventory of all caves within the karst environments should be maintained and recreation access should be strictly managed in accordance with the *Policy to Manage Public Access to Caves within DENR Reserves in South Australia* (DENR 1991c). Where access is permitted, emergency response plans must be prepared.

Actions	*Priority*	*Duration*
Record and enter in a database the location, photograph of entrance and, when fully explored, map and rescue response plan of all known surface caves.	Medium	5 years

KELLY HILL CONSERVATION PARK AND CAPE BOUGUER WILDERNESS PROTECTION AREA

Strategies

The cave system of Kelly Hill Conservation Park includes a large number of caverns at several levels. The formations in those caverns include many very delicate and beautiful speleothems, in particular a range of helictites. The caves should be classified and managed as outlined in the *Policy to Manage Public Access to Caves within DENR Reserves in South Australia*. These classes of caves are:

1. Show Caves
   Managed to provide guided tours with a balance between education and aesthetic appreciation of cultural, geological and palaeontological values of the cave. Access will

be only under direct supervision of guiding staff or with written approval for research;

2. Adventure Caves
   Managed to provide guided tours with a balance between interest in the features of the cave and the challenge in its exploration along pre-determined routes which avoid damage of vulnerable features. Access will be only under strict supervision of guiding staff or with written approval for recreational caving or research;
3. Reference Caves
   Protected from disturbance as far as is practicable. Access will only be provided for research specifically related to the baseline functions of the cave, where such research cannot be reasonably carried out elsewhere;
4. Special Natural Value Caves
   Managed to protect the special values of the cave. Access will only be permitted for documentation and research to enhance management of those values;
5. Dangerous Caves
   Managed to protect human life and may provide opportunity for scientific research by appropriate persons; and
6. Wild Caves
   Managed to provide opportunities for responsible cave recreation, exploration and research.

The developments for show caves have been planned around maximising the visitor experience. The lighting and paths ensure visitors are given the opportunity to see all available parts of the cave. These areas are regularly maintained, paths cleaned and lights replaced as necessary. All visitors entering the cave are escorted by guides to ensure the safety of visitors and to protect the formations. The formations are cleaned and measures taken to prevent or control the growth of any lampenflora. Cleaning and protection measures should continue as required.

The entrance to the show cave is very steep and corrective measures should be undertaken to enlarge and realign the entrance as funds become available. Until this is achieved, visitors must be warned about the angle of descent and the need to take care.

The original entrance to the cave has been enlarged, therefore humidity and carbon dioxide levels need to be monitored and an additional door needs to be constructed to minimise air flow at the base of the stairs. The formations around the entrance, in particular at the first assembly point, should be continually monitored. If damage to formations occurs, professional advice should be sought and remedial action taken.

Caves classified as adventure caves may be used by educational groups, provided they are accompanied by an adventure cave leader, accredited by DEHAA in accordance with the *Kelly Hill Conservation Park Adventure Caving Training Manual*.

Special natural value caves are delicate areas that are either easily damaged or of scientific interest and hence require special protection. Groups entering these areas must demonstrate to the District Ranger a scientific need to enter the area for research purposes and possess a thorough understanding of the sensitivity of the areas and methods of minimising damage. It is proposed that any newly discovered cave be classified as a special natural value cave until further research indicates its inclusion in another category.

Members of accredited adventure caving groups may apply for a permit to access caves in accordance with the *Policy to Manage Public Access to Caves within DENR Reserves in South Australia*.

Although significant areas of the cave system have been explored and mapped by the Cave Exploration Group of South Australia, there are extensive areas yet to be fully explored. A

systematic survey of Kelly Hill Conservation Park should be made and all cave entrances located and accurately surveyed. In conjunction with the above-ground survey, detailed below-ground surveys of caves and formations should be conducted. Information should be recorded on a database, including location on the Australian Mapping Grid, map and a rescue response plan.

The surveys are necessary to ensure appropriate management of the entire cave system. They should be used in planning all future management of the park and surrounding areas, for example, water management. No development outside of the proposals contained in this plan should be proposed before the cave survey is completed. The Cave Exploration Group of South Australia, or similar accredited organisation, should be requested to undertake this work. DEHAA should supply any assistance and resources necessary to complete the survey as quickly as possible.

In order to maintain the integrity of the karst system, the hydrology of the region must be preserved. Therefore, a detailed hydrological study must be made. Any new or existing development work in the Kelly Hill Conservation Park must have regard to their effect on the hydrology of the karst system.

Actions	*Priority*	*Duration*
Initiate a study of the hydrology of the main cave, investigating the effects of the creek diversion that feeds the main water supply dam to the west of the staff residence and implement any remedial measures that such a study may indicate.	High	12 months
Record and enter in a database the location, photograph of entrance and, when fully explored, map and rescue response plan of all known surface caves within Kelly Hill Conservation Park and Cape Bouguer Wilderness Protection Area.	High	3 years
Establish a door at the base of the stairs at the entrance to the show cave to minimise air flow.	High	3 years
Monitor the condition of caves visited by adventure cavers and take steps to remedy any degradation.	High	Ongoing
Monitor the cave environment and record humidity, temperature, pH of solution, structural condition and status of lampenflora on a regular basis, especially at the cave entrance.	High	Ongoing

8.4. Palaeontology and Archaeology

Strategies

Palaeontological and archaeological deposits may exist in all reserves, particularly near existing and historic wetland environments and in the numerous caves in karst environments. New discoveries should be recorded in a database and actions will be undertaken where necessary to preserve the integrity of any deposit.

Actions	*Priority*	*Duration*
Record and enter in a database with GIS capability, any discovery of palaeontological deposits within reserves and undertake actions necessary for their conservation.	High	Ongoing

FLINDERS CHASE NATIONAL PARK

Strategies

Fossilised bones of large, extinct marsupials have been recovered from the edge of Black Creek Swamp at Rocky River since 1907, when the reserve caretaker, Mr C J May, discovered them while excavating building sand. The site was brought to the attention of the scientific community in 1935 by N B Tindale and colleagues of the South Australian Museum, whose systematic search discovered the remains of *Zygomaturus, Diprotodon* and *Macropus* species. Later workers confirmed the extensive nature of the fossil horizon and carbon dating suggests it is one of the last refuges of Australian megafauna (about 19,500 years B P).

More recently, archaeological deposits have been investigated at the same site. There exists a very real possibility that a stratigraphic horizon may be found that preserves evidence of interaction between the megafauna and human inhabitants. If found, evidence for Australia's "big game hunters" would prove to be internationally significant and should be afforded a high management priority.

The site extends along the southern edge of a swampy flat near to the original homestead at Rocky River. The ranger's home, workshops and sheds have been built at the location and these buildings may need to be relocated if the full potential of the site is to be realised. Consideration should be given for building relocation and actions should be taken to conserve the fossil beds and interpret them for visitors.

Actions	*Priority*	*Duration*
Ensure that any development of the Rocky River headquarters area incorporates full consideration of both palaeontological and archaeological deposits.	High	Ongoing

9. CULTURAL RESOURCE MANAGEMENT

All historic sites should be managed in accordance with the guidelines laid down by *The Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (The Burra Charter)* (Australia International Council of Monuments and Sites 1988). A conservation management plan incorporating these guidelines will be prepared for all historic sites. Future usage of heritage sites must be compatible with the preservation of their integrity.

Interpretive programs should be developed to encourage greater public awareness and appreciation of the rich cultural heritage contained in the reserves.

Many sites in reserves are recorded on the Register of State Heritage Items and the Weirs Cove area in Flinders Chase National Park is protected under the *Aboriginal and Historic Relics Preservation Act, 1965*. Flinders Chase National Park is listed on the Register of the National Estate.

9.1. Aboriginal Heritage

Strategies

Aboriginal sites have been identified at Cape du Couedic, Rocky River, West Bay and Ravine des Casoars. It is likely that evidence of Aboriginal occupation may also be found in unexplored caves.

There has been no comprehensive archaeological inventory undertaken for the park. Such a survey should be progressively undertaken to assess and record the sites of significance and to improve knowledge of Aboriginal history in the area. Aboriginal sites in the park need to be identified, assessed and recorded on a database with spatial capabilities (eg GIS) in close liaison with the Division of State Aboriginal Affairs of the Department for Environment, Heritage and Aboriginal Affairs.

Before any construction or development works are undertaken in the park, an archaeological survey should be undertaken at the location and its surrounds to ensure that sites of significance are protected, in consultation with the Division of State Aboriginal Affairs of the Department for Environment, Heritage and Aboriginal Affairs.

Actions	*Priority*	*Duration*
Undertake an inventory of the palaeontological and archaeological resources within the Rocky River headquarters area.	High	12 months
Undertake an archaeological inventory of the park, including both Aboriginal and European heritage in consultation with the State Heritage Branch and the Division of State Aboriginal Affairs, maintaining information on a database.	Low	10 years

9.2. European Heritage

Strategies

Sites of European heritage in the park need to be identified, assessed and recorded on a database with spatial capabilities (eg GIS) and close liaison should be maintained with the State Heritage Branch of DEHAA.

Shipwrecks

The west coast of Kangaroo Island was the scene of at least fourteen shipwrecks, several of disastrous proportions. One of the most important of these was the *Loch Vennachar*, wrecked off West Bay in September 1905, the site of which has been declared an historic shipwreck. The anchor from this vessel is currently displayed in the park and serves as a tangible reminder for visitors of the great loss of life and property through shipping mishaps along the nearby coast. It is proposed to relocate the anchor from its present site at Rocky River headquarters area to a site at West Bay, near to where the tragedy took place. There are also several graves of shipwreck victims located along the coast. This information and anecdotes relating to the shipwrecks should be documented and records maintained.

It is recommended that new information about shipwrecks along the coast of Flinders Chase National Park be forwarded to the Maritime Archaeology Section of the State Heritage Branch, DEHAA. Shipwreck sites should be afforded the necessary protection as required by the State (1981) and Federal (1976) *Historic Shipwrecks Act*. The Commonwealth *Act* (1976) automatically protects shipwrecks 75 years old or older.

An inventory of victims' grave sites and relics of shipwrecks should be compiled and maintained. Shipwreck graves and relics should be preserved and the impact of public access minimised.

Actions	*Priority*	*Duration*
Any new information about shipwrecks along the coast of Kangaroo Island should be forwarded to the Maritime Archaeology Section of the State Heritage Branch, DEHAA.	High	Ongoing
Initiate and maintain an inventory of victims' grave sites and relics of shipwrecks and ensure their protection in consultation with State Heritage Branch, DEHAA.	Medium	5 years
Relocate the anchor from the *Loch Vennachar* to West Bay.	Low	3 years

FLINDERS CHASE NATIONAL PARK

Strategies

Lighthouses

The lighthouses and precincts at Cape du Couedic and Cape Borda are of heritage significance and are listed on the State and National Heritage Registers. The Burra Charter (1988) forms the basis of all heritage management within the DEHAA. Heritage conservation plans for both sites have also been developed in accordance with the principles of this charter. They are situated on the scenic and rugged coastline of western Kangaroo Island and are popular with park visitors. The cottages are commercially let to provide a unique historic experience. This generates revenue for the purposes of undertaking maintenance, restoration and sympathetic development in accordance with the guidelines of the heritage conservation plans.

(a) Cape Borda and Harveys Return

A lighthouse was constructed at Cape Borda in 1858 to aid navigation in the busy shipping lanes to Port Adelaide. The lighthouse has been operational since then and was one of the last with resident lighthouse keepers. Communication with the lighthouse was considered so important that a telegraph line and Lloyds Signal Station were installed at Cape Borda as early as 1876. The lighthouse was destaffed in 1989, but still functions as a navigational aid under the ownership of the Australian Maritime Safety Authority. The lighthouse reserve and its unused structures have now been incorporated into Flinders Chase National Park. The lighthouse is to be preserved and the cottages are to be maintained for public accommodation purposes. DEHAA staff conduct interpretive tours of the museum and lighthouse.

Harveys Return landing is located to the east of the lighthouse, where supplies and personnel were unloaded for the lighthouse, often in hazardous conditions. This is also the site of a cemetery, where lighthouse keepers, members of their families and shipwreck victims are buried. The site today reflects the isolation and hardship of the lighthouse keepers and the rugged, hazardous nature of the nearby coastline. It symbolises the importance of sea trade and shipping as the main means of transport to the western end of Kangaroo Island prior to the advent of roads.

Cape Borda Lighthouse, Harveys Return Landing and Harveys Return Cemetery are recorded on both the National Estate Register and the Register of State Heritage Items.

Relics at Harveys Return Landing are suffering considerable deterioration. Removal or relocation of relics from the site should only be done after consultation with the State Heritage Branch.

(b) Cape du Couedic and Weirs Cove

The circular, masonry lighthouse at Cape du Couedic, built from locally quarried stone, lighthouse keepers' cottages and store house, jetty and the remnants of the flying fox at Weirs Cove represent remarkable engineering achievements considering the remote location of south-west Kangaroo Island. The flying fox installation bears witness to the hazardous nature of providing supplies to lighthouse personnel. The substantial nature of structures in the lighthouse complex is also indicative of the importance of the lighthouse at the turn of the century. All of the site and structures associated with the Cape du Couedic lighthouse complex and Weirs Cove are on the State Register of Heritage Items. Weirs Cove Flying Fox, including the jetty, funnel-way and store ruins are recorded on the National Estate Register.

With improved road transport in the 1940s, the Weirs Cove supply landing site became redundant and with time, inoperable. The area was added to Flinders Chase National Park and several of the structures were removed. The roof of the three-roomed stone storehouse on the clifftop at Weirs Cove was removed and the remaining ruin is to be preserved in its existing state and prevented from deteriorating further. The flying fox mechanism used to haul up supplies was dismantled and only its footings remain. The dramatic stone cutting for the flying fox is a long-lived feature, but the iron and timber jetty at the base of the cliff is suffering deterioration.

In the late 1950s the Cape du Couedic lighthouse was destaffed and the light converted to automatic operation to service only the local sea trade. The lighthouse cottages are now used for visitor accommodation. Revenue received from this is used for maintenance and restoration of the buildings.

It is recommended that, if the lighthouse ever becomes surplus to requirements, approaches be made to the Australian Maritime Safety Authority for the structure to be formally added to Flinders Chase National Park. Urgent conservation measures should

be undertaken to make safe the jetty and maintain the ruined storehouse at Weirs Cove. Actions should continue to be taken to provide the necessary maintenance and upkeep of the lighthouse keepers' cottages.

National Estate Grant funding should continue to be sought from the Australian Heritage Commission through the State Heritage Branch of DEHAA.

It is recommended that any future development of the Cape du Couedic or the Weirs Cove areas are in accordance with the principles of the Burra Charter and the adopted heritage conservation plan.

Pastoral land use

May's Homestead and Postman's Cottage date from the late nineteenth century. Built by pastoral lessee Charles May, who later became the first ranger of Flinders Chase, they are good examples of vernacular architecture. The homestead, which was upgraded in about 1920 for use by members of the Fauna and Flora Board, is on the Register of State Heritage Items.

It is recommended that May's Homestead and Postman's Cottage be maintained. Any future changes or use of the cottages should be in keeping with the historic and aesthetic integrity of the buildings and should be carried out in accordance with the conservation management plan.

Actions	*Priority*	*Duration*
Prepare and implement a heritage conservation plan to ensure the maintenance of the aesthetic and historic integrity of:		
a) May's Homestead and Postman's Cottage,	Very	a) 3 years
b) Cape du Couedic and Weirs Cove and	High	b) 3 years
c) Cape Borda and Harveys Return.		c) 3 years
Undertake conservation measures to secure the jetty, remnant flying fox structure and storehouses at Weirs Cove.	High	3 years
Continue to seek National Estate Grant funding from the Australian Heritage Commission, for the restoration of heritage buildings.	High	Ongoing
Undertake an archaeological inventory of the park, including both Aboriginal and European heritage in consultation with the DEHAA State Heritage Branch, maintaining information on a database.	Low	10 years

RAVINE DES CASOARS WILDERNESS PROTECTION AREA

Strategies

Exploration:

The west coast of Kangaroo Island was visited by the French explorer Baudin in 1802-3. He assigned many French names to features of the coast, including Ravine des Casoars. A cave on the coast at the outlet to the Ravine des Casoars was seen by several reliable witnesses to bear an inscription of Baudin's name about one metre across and several other French names, possibly of sailors.

Efforts to relocate this significant signature in the last few years by John Dallwitz, consultant to the Heritage Conservation Branch of DEHAA and others, have been unsuccessful. The name may have been temporarily obscured by sand movement and changes in cave floor level. If this name were to be found, the cave would be one of the most important sites of early European contact on the island, perhaps equal in importance to Frenchman's Rock at Penneshaw. The cave also contains names carved by nineteenth century pastoralists on western Kangaroo Island, including John Hirst of Snug Cove.

It is recommended that the cave at the Ravine des Casoars be nominated for inclusion in the Register of State Heritage Items regardless of whether Baudin's signature is relocated or not.

A systematic search for Baudin's signature should be undertaken and in the event of it being found, appropriate documentation and conservation measures should be undertaken to protect it and the cave and interpretive material should be provided at the site. The site's historic graffiti is worthy of protection.

Actions	*Priority*	*Duration*
Submit nomination for inclusion of "Baudin's Cave" at the Ravine des Casoars on the Register of State Heritage Items and provide appropriate historic interpretive material.	Medium	5 years
Undertake a systematic search for Baudin's signature in the cave at Ravine des Casoars and implement conservation measures for its protection.	Low	5 years
Undertake an archaeological inventory of the park, including both Aboriginal and European heritage in consultation with the DEHAA State Heritage Branch, maintaining information on a database.	Low	10 years

KELLY HILL CONSERVATION PARK

Strategies

Grassdale Station was occupied from the 1920s until 1973, the area being run largely as a grazing property. Numerous buildings and ruins, pieces of farm machinery and other abandoned farm debris are scattered around the area. The register of these items should be maintained. Any significant items should be preserved either *in situ* or at an appropriate museum. The old sealer's hut at Grassdale has been refurbished and should be maintained in accordance with the conservation management guidelines.

Bush camping and day visitor facilities should be provided to improve visitor access to the Grassdale area.

Power for the Grassdale area is transmitted by single wire earth return (SWER) overhead cable along an easement through the park from South Coast Road. The easement through which the SWER cable passes impacts considerably on the vegetation.

An alternative power source should be developed as soon as possible for Grassdale. The SWER power line from South Coast Road should then be removed and the easement allowed to regenerate.

Actions	*Priority*	*Duration*
Continue to seek National Estates Grant funds from the Australian Heritage Commission, for the restoration of heritage buildings.	High	Ongoing
Maintain the old sealer's hut at Grassdale, preserving it as an historic precinct, while providing accommodation for visitors.	High	Ongoing
Prepare a development plan for the Grassdale area, ensuring the cultural heritage of the area is conserved.	High	3 years

9.3. Recent Heritage

FLINDERS CHASE NATIONAL PARK

Strategies

An historic file of unusual or important events, staffing records, verbal historic accounts and memorabilia, including photographic records should be compiled and maintained.

Adequate records should be made before alterations to any structures in the reserves are undertaken. It is recommended that any new developments are photographically documented and that the date and construction details are recorded in a park file.

It is recommended that, for future reference, disasters such as fires, floods and accidents, as well as unusual and important events, should be recorded in an historic file. A record of the details of ranger appointments should also be kept.

Actions	*Priority*	*Duration*
Initiate and maintain an historic file of unusual or important events, staffing records, verbal historic accounts and memorabilia, including photographic records.	High	Ongoing
Initiate a file of records of:		
a) current and historical buildings and service utilities and	Medium	a)5 years
b) new buildings and service utilities constructed within the reserves.		b)Ongoing

10.VISITOR MANAGEMENT AND INFRASTRUCTURE DEVELOPMENT

10.1. Zoning

Section 39 of the *National Parks and Wildlife Act 1972* specifically allows for a management plan to divide a reserve into zones and states that land should be managed in accordance with the conditions declared by the management plan to be appropriate to that zone.

Zoning is a basic tool in land use planning in natural areas and serves two major functions:

1. it excludes areas of high conservation value from inappropriate developments; and
2. it attempts to ensure that sustainable developments are both environmentally and aesthetically compatible.

This plan recognises three zones:

a) Major Development Zones:
which may include park administration, staff accommodation, service infrastructures and major visitor facilities.

b) Minor Development Zones:
which may include camping sites, toilets, water tanks, picnic areas, car parks, trail heads and interpretive sites.

c) Limited Access Zones:
which are areas not zoned for development that may be managed for their high conservation value or for visitor safety.

Planning Principles for Major and Minor Development Zones

Designation of development zones does not imply the exclusion of conservation principles in these areas. The design and layout of developments should reflect a sensitivity to the landscape and environment. There are, within the development zones and elsewhere in the reserves, sites and structures of historic or archaeological significance. These should be accorded special protection.

In any site design there are constraints to be considered, problems to be identified and optimum design solutions to be found using best practice principles of landscape design. Planning of the site must take into consideration the following constraints:

Physical Site Factors for Built Structures and Facilities

- Site stability
  Site drainage, susceptibility to flooding, erosion, etc.
- Construction difficulty
  Degree of slope, subsoil characteristics, presence and extent of rock outcrops, etc.
- Site amenity
  Presence of vegetation (shade and visual setting), views, etc.
- Site productivity
  Depth of soil, soil fertility, etc.
- Site aesthetics
  Position in landscape, location with respect to other park features, human-made developments, etc.
- Site accessibility
  Location with respect to existing/proposed road access, distance from population centres, etc.
- Landscape impact
  Potential visual impact of any structural development on the park landscape.

- Site exposure
  Orientation of site and exposure to prevailing winds, etc.
- Site services
  Difficulty/cost in providing water, power and other services; opportunities for on-site development of any service requirements.
- Site adaptability
  Size and location of site as it influences options for alternative building arrangements/layouts.

Managerial Factors

- Interpretation
  Prospects for interpretation of park features/processes, immediately on or adjacent to site.
- Visitor accessibility
  Ease of access for park visitors (site location and distance of facilities from existing population centres/facilities external to the park).
- User Groups
  Separating conflicting uses and user groups.

Social Factors

- Privacy for staff
  Site location as it effects privacy of park staff (i.e. relation to major roads, distance from park developments and attractions, etc.)
- Job satisfaction
  Benefits and problems associated with working and living within the park (i.e. on-the-job) as opposed to living outside the park.

Design Requirements

- Landscape
  Landscape design and integration of landscape values is paramount and will control the direction the project will take. A landscape design will need to be developed and incorporated with the architectural and engineering designs. There must be minimum vegetation disturbance and the principle of rehabilitating degraded lands with appropriate local plant species must be considered to optimise the use of natural vegetation. Natural landscape parameters must guide the selection of colours, building materials and design profiles to ensure a consistent and appropriate theme. All materials and design features are to be in keeping with the surrounding landscape and the area's tenure.
- Architectural
  Design of the whole project and the various building units within will require innovation and the use of best practice technologies, particularly as there are a number of unquantifiable questions which will arise e.g., spatial requirements for displays and degree of flexibility required. The choice of materials is optional, but rammed earth and stone should be considered and evaluated to the full.

  The primary criteria in design are:
  a) Aesthetics - building will blend in as part of the natural environment.
  b) Energy conservation - buildings and facilities must be thermally efficient in terms of energy. Evaporative air-conditioning and/or fans may be considered but refrigerated air-conditioning and other energy-demanding technology is not appropriate.
  c) Water conservation - maximum use should be made of roofs for water catchment

(rain water will be the main source of supply). Landscape design should consider trickle reticulation for trees and shrubs using treated and or natural groundwater. A split-system of potable and/or non-potable water is required.

d) Flexibility - the ability for future expansion of the individual components should be considered. For example, the day visitor area and camping grounds should incorporate expansion as a design feature. An "outdoor" amphitheatre should be considered in conjunction with visitor centre, as a flexible use 'meeting area'.

- Engineering
  There are a number of constraints, which will directly impinge on architectural design. As a concept, limits on services (power, water and waste) should be considered with finite upper levels and "carrying capacities" determined, in contrast to continued expansion as demand increases.

FLINDERS CHASE NATIONAL PARK

Strategies

Major Development Zones (Figure 2) are:

- Rocky River headquarters area;
- Cape du Couedic heritage precinct.

Minor Development Zones are:

- Remarkable Rocks;
- Bunker Hill;
- Snake Lagoon;
- West Bay;
- Platypus viewing area;
- walking trails in accordance with a district walking trail development plan.

Limited Access Zones include:

- Larrikin Lagoon;
- west Gosse Land;
- sand dunes west of Rocky River Headquarters area;
- Rocky River wetland, east of the platypus viewing area.

KELLY HILL CONSERVATION PARK

Strategies

Major Development Zone

The headquarters area and the main visitor centre near the caves shall be designated as a major development zone. This zone will accommodate the administration and services function, staff accommodation and the majority of visitors.

Minor Development Zone

The cleared area around Grassdale and the South-West River was modified by previous agricultural use and now supports large numbers of kangaroos and wallabies and provides habitat for bush stone-curlews. This area should be designated as a minor development zone to permit the rehabilitation and maintenance of the historic site and to allow the development of minor day visitor facilities.

10.2. General Reserves Trust Operations

The General Reserves Trust (GRT) has been established to enable the establishment of tourism initiatives through user-pay principles and to provide additional funds for specific conservation related projects. These initiatives have enabled the agency to maintain high standards of visitor services and facilities and conservation management, despite declines in traditional sources of funding. Details of specific GRT operations and initiatives within the reserves are defined in individual business plans.

10.3. Visitor Facilities and Infrastructure Development

Visitor facilities should be provided for public enjoyment, based on and compatible with the conservation values of the reserves.

FLINDERS CHASE NATIONAL PARK

Strategies

Flinders Chase National Park is a major park of national significance and its headquarters should reflect its status as a park of national importance and one of South Australia's prime tourism assets. The Rocky River headquarters area has to satisfy a number of functions, including day and overnight visitor accommodation, park administration, staff accommodation and service facilities.

Rocky River headquarters area has a long history of development, dating back to the time of the original Rocky River Pastoral Lease. As the site of May's Homestead and the focus of previous pastoral activities, it was a logical place for the development of the park headquarters. In the absence of a management plan, ad hoc developments in the headquarters area have taken place over the past sixty years, as the need has arisen.

The Rocky River site should be developed to provide a range of visitor accommodation and associated facilities, that will enhance public enjoyment and visual amenity and ensure effective management of the area and the park in general. Traditionally, facilities in parks on Kangaroo Island have been simple and low-key and in keeping with their reputation as places to quietly enjoy natural and historical attractions.

The number of visitors now coming to Flinders Chase each year has clearly demonstrated the inadequacies of the present layout and facilities at the Rocky River headquarters area. Current trends suggest that visitor numbers will continue to increase in the foreseeable future; consequently, there is a need to plan for effective visitor management and to develop management infrastructure to meet this demand well beyond the year 2000.

Several reports on tourism on Kangaroo Island identified a general shortage of tourist accommodation on the western end of the island and reinforced the need for DEHAA to plan for appropriate development to meet this demand. In addition, it is important that areas set aside for day use are separate from camping areas, to provide campers with solitude and privacy.

High quality day visitor facilities should be provided at Rocky River reception area, Rocky River Bridge, Remarkable Rocks, Cape du Couedic, Snake Lagoon, Breakneck River, West Bay and Cape Borda. Picnic and barbecue facilities are provided at a number of localities. Many of these are designed for larger groups. There is a need for additional facilities for smaller family groups. Improved toilet facilities are required at Rocky River headquarters and additional toilet facilities are required in the Cape du Couedic vicinity.

Bus visitors comprise a significant proportion of all visitors to the park and adequate facilities should be provided for them. DEHAA staff have a close involvement with tour operators and several management strategies are in place to ensure that close communications are maintained with bus drivers in order to resolve any problem issues. Bus traffic will be monitored and adjustments made to ensure efficient traffic flow.

The design and layout of developed areas should be of best practice standard to optimise ease of management, public enjoyment and visual amenity and adopt sound principles of site layout and design.

The design objectives for this area should include:

- Visitor Centre/Administration

a) To make provision for and make recommendation for the placement of a visitor centre that caters for information dissemination, collection of entry fees, provision of interpretation displays and commercial aspects of souvenir and food sales; and
b) In addition the visitor centre needs to incorporate an administration centre for the district office;

The visitor/district administration centre is to incorporate:

a) entrance fee payment system;
b) information counter;
c) interpretive centre with reading room incorporating information technology;
d) retail display area;
e) coffee shop incorporating food preparation area and visitor eating area;
f) public toilets incorporating disabled facilities;
g) staff offices with easy access to visitor centre;
h) administrative, operations and conference room;
i) staff room and facilities; and
j) disabled access to and facilities in, all buildings including the visitor centre, administration area and toilets;

- Interpretation

To provide a range of interpretive opportunities to enhance visitor enjoyment and appreciation of the park;

- Walking Trails

To develop a radial walking trail network;

- Car Parks and Traffic Plan

a) To provide a Visitor Centre car park with adequate space for ease of access and visitor safety; and
b) To provide safe and easy access and egress of coaches;

- Day Visitor Facilities

a) To provide guidelines for the design, location and expansion of day visitor areas; and
b) To provide sufficient and separate facilities for private day visitors and commercial operators;

- Staff Residences

a) To isolate staff residences from day visitor areas; and
b) To provide capacity for additional staff accommodation in future;

- Services and Utilities

a) To isolate service and maintenance function areas from day visitor areas;
b) To provide adequate foul water and septic disposal system;
c) To investigate the natural hydrological system in the area and incorporate adequate water collection systems to cater for the natural systems and the projected visitor increase and the requirements of the concept plan;
d) To employ environmental best practises in rehabilitation of a degraded impacted site; and
e) Suggest alternative methods and guidelines for the safe, efficient and resourceful disposal of effluent.

- Campground
  a) To provide a well designed campground with secluded and demarcated sites;
  b) To provide space and appropriate vehicle access for caravans and camper vans; and
  c) To provide an appropriate campground ablution facility;
- Accommodation
  To provide a range of visitor accommodation including bunkhouse and small energy efficient cabins;
- Research Facility
  To continue to provide appropriate and adequate research facility incorporating a laboratory, storage and accommodation area in association with the University of Adelaide (see 10.7, Alien Tenures);
- Visitor management
  Although Rocky River headquarters is the central orientation point and centre for the dissemination of information in the park, there is a need for the separation of campers from day visitors and day visitors from management staff;
- Environmental protection
  This area is suitable habitat for koalas, Cape Barren geese and kangaroos and provides easy viewing opportunities for visitors. Although a substantial area of the site has been cleared, future developments should be located to minimise further clearance of native vegetation wherever possible;
- Landform and landscape values
  The undulating terrain of the site, the scarcity of suitable flat land and the presence of areas subject to inundation limit the available space for siting new developments;
- Heritage
  The historical and heritage value of the May's Homestead and Postman's Cottage should be taken into account in the site design; and
- Fire protection
  Fire prevention plans, wildfire operation and wildfire suppression strategies need to be incorporated.

As a consequence, a Draft Master Plan (CALM 1998) has been developed to address current problems with site layout, existing functions and future needs. This plan provides an ideal opportunity to apply best practice principles of site design to ensure that future development is orderly, functional, environmentally sound and aesthetically pleasing. The Draft Master Plan will ensure that all built structures conform to sustainable development guidelines, are designed to blend with their environment and use innovative and environmentally friendly technology. The plan will incorporate the above constraints and be adopted following a period of public consultation.

Actions	*Priority*	*Duration*
Prepare a development plan for the Rocky River headquarters area with full public consultation, incorporating: 1. administration facilities; 2. visitor centre; 3. public toilet; 4. retail sales area; 5. camping area, with ablution block and laundry facilities; 6. built visitor accommodation, including cabins.	High	12 months
Construct toilet facilities in the Cape du Couedic precinct.	High	5 years

RAVINE DES CASOARS WILDERNESS PROTECTION AREA

Strategies

Toilets and picnic facilities are provided at Harveys Return for day visitors. These should be retained.

Action	*Priority*	*Duration*
Maintain existing picnic facilities for small groups at Harveys Return.	Medium	12 months

KELLY HILL CONSERVATION PARK

Strategies

The features of greatest importance to visitors are the caves and the natural environment. Facilities are confined to a small node on the northern side of the park, near to the entrance of the main show cave. Across Kangaroo Island the overall trend in visitation is increasing and suitable facilities must be provided for these visitors. In the event that facilities are no longer able to adequately service visitors, their nature and form will be reviewed and upgraded as necessary.

Visitation to the caves should aim to maximise enjoyment and education while ensuring both visitor safety and protection of the caves and their formations. All developments must be sympathetic to the environment and protect biological diversity and the karst system. The visitor centre at Kelly Hill Conservation Park day visitor area needs to be upgraded to comply with Australian Standards for public safety. In particular, visitor access to the centre, including disabled access will be addressed.

A development plan for the Kelly Hill Conservation Park day visitor centre will be prepared and implemented, utilising best practice standards to optimise ease of management, public enjoyment and visual amenity and adopting sound principles of site layout and design. The plan will provide for vehicle access and parking and visitor access to the caves.

Adventure caving provides more diverse experiences for visitors, while generating revenue. However, no further adventure caves should be developed other than the existing Old Cave Entrance, K9, Mount Taylor and the proposed vertical entrance cave, New Years Day Cave.

Apart from the caves, Kelly Hill Conservation Park provides opportunities for visitors to enjoy nature study through bushwalking. Entrances to some caves are near to established walking trails and in their natural state, present a risk to the unwary walker.

Cave entrances near to walking trails will be identified and their safety assessed. If necessary, public safety protection works will be implemented, ensuring that impacts to the environment are minimized.

Actions	*Priority*	*Duration*
Assess annually and undertake ongoing monitoring of the safety of public access caves.	High	Ongoing
Entrances to caves adjacent to walking trails in the park will be made safe and secure.	High	Ongoing
Access to the visitor centre will be upgraded to meet Australian Standards and to cater for disabled visitors.	High	3 years

Prepare and implement a development plan for the visitor centre, incorporating visitor facilities that provide access to the caves, interpretation material for the park and parking of vehicles.	High	3 years
Realign and enlarge the entrance to the show cave in order to overcome the excessively steep stairway.	High	3 years

10.3.1.Walking Trails

Strategies

A district walking trail development plan will be prepared with public consultation, detailing:

1. standards to be applied to all walking trails;
2. the scope of existing walking trails, detailing current status, upgrading work required and interpretation themes;
3. proposed routes for new walking trails;
4. design plans for boardwalks and viewing platforms;

Best practice principles of design will be utilised, taking into account all environmental factors.

Interpretive brochures should be prepared for all walking trails and eventually incorporated into a saleable souvenir booklet.

Actions	*Priority*	*Duration*
Prepare a district walking trail development plan incorporating interpretive signage, boardwalks and viewing platforms where necessary, giving details of standards to be applied to existing and new walking trails.	High	3 years

FLINDERS CHASE NATIONAL PARK

Strategies

1. Maintain existing walking trails at:
   - Black Swamp;
   - Rocky River mouth;
   - Sandy Creek;
   - Breakneck River;
   - Ravine des Casoars (loop to river mouth);
   - The Oval;
   - Cape Borda to the cliff-top; and
   - Cape Borda cliff-tops to Harveys Return;
2. New trails should be developed at:
   - Rocky River Visitor Centre, through Black Swamp to the platypus viewing area;
   - Rocky River Visitor Centre to Snake Lagoon; and
   - Rocky River to Bunker Hill;
3. Boardwalks should be developed for the following sites:
   - Admirals Arch
   - Platypus viewing areas
   - Remarkable Rocks
   - West Bay;
4. Viewing platforms should be developed for the following sites:
   - Remarkable Rocks Lookout
   - Cape Borda clifftop;
   - Platypus viewing areas.
   - Bunker Hill

Actions	*Priority*	*Duration*
Maintain existing walking trails to a high standard.	High	Ongoing
Develop, construct and maintain new walking trails at: a) Rocky River Visitor Centre through the Black Swamp area to the Rocky River platypus viewing area, including the restoration and rehabilitation of the original water courses; b) Rocky River Visitor Centre to Snake Lagoon; c) Rocky River Visitor Centre to Bunker Hill; and d) any other trail identified as appropriate during the development of the district walking trail plan.	High	3 years
Develop, construct and maintain boardwalks at: a) Admirals Arch; b) Remarkable Rocks; c) Platypus Viewing Area; and d) West Bay.	a) High b) High c) Medium d) Medium	a) Ongoing b) 3 years c) 5 years d) 5 years
Develop, construct and maintain viewing platforms, with safety barriers where appropriate, at: a) Remarkable Rocks Lookout; b) Cape Borda clifftop; c) Platypus viewing areas; and d) Bunker Hill	a) High b) High c) High d) Low	a) 3 years b) 3 years c) 5 years d) 10 years
Replace existing eroded and compacted limestone path to Admirals Arch with a more appropriate structure.	High	5 years

RAVINE DES CASOARS WILDERNESS PROTECTION AREA

Strategies

Existing walking trails along coastline and the loop trail along the Ravine des Casoars will be maintained, preserving their wilderness qualities. Environmental impacts will be monitored, and, where appropriate, protection works or trail developments will be undertaken in accordance with the district walking trail development plan and the Wilderness Code of Management.

Action	*Priority*	*Duration*
Maintain existing walking trails to a high standard, minimising their impact on wilderness quality.	High	Ongoing

KELLY HILL CONSERVATION PARK

Strategies

1. Maintain existing walking trails to a high standard at:
   - Kelly Hill to Hanson Bay trail;
   - Burgess Trail;
   - Harold Bell Trail; and
   - May's Trail;

3. Develop a loop trail from Kelly Hill day visitor area to Grassdale Lagoon.

Action	*Priority*	*Duration*
Maintain and develop walking trails in accordance with the district walking trail development plan.	High	3 years

CAPE BOUGUER WILDERNESS PROTECTION AREA

Strategies

The existing nine kilometre walking trail leading from the caves area at Kelly Hill Conservation Park, past the lagoons and wetlands south-east of Grassdale, to the mouth of the South West River at Hanson Bay will be maintained to a high standard to preserve its wilderness quality. Environmental impacts will be monitored, and, where appropriate, protection works or trail developments will be undertaken in accordance with the district walking trail development plan and the Wilderness Code of Management.

The lagoons at Grassdale have not been affected by European settlement to any great extent, except for the construction of a dyke into the area to drain Little Terror Creek and the northern area of Grassdale. They are the habitat for many water-birds and rare plants. Uncontrolled access to the lagoons may impact on these. The site will be monitored and if necessary, visitor access will be controlled.

Actions	*Priority*	*Duration*
Maintain the walking trail from the Kelly Hill visitor centre to Hanson Bay adjacent to the lagoons and wetland habitat near Grassdale and if necessary, provide controlled access to avoid environmental impact.	Medium	Ongoing

10.3.2.Accommodation and Camping

FLINDERS CHASE NATIONAL PARK

Strategies

Built accommodation is currently available at:

- May's Homestead and Postman's Cottage in the Rocky River headquarters area;
- The former lighthouse keepers' cottages, called Troubridge, Parndana and Karatta Lodges at Cape du Couedic; and
- The former lighthouse keepers' cottages, called Flinders Light Lodge, Hartley Hut and Woodward Hut at Cape Borda.

Camping is permitted at the Rocky River headquarters area, where showers and toilets are available and elsewhere in the park at West Bay and Snake Lagoon.

Bush Camping facilities (away from Rocky River headquarters area)

The location and layout of all camping areas away from Rocky River headquarters should be viewed as part of an overall conceptual planning process. A re-examination of the layout of all camping areas has already been undertaken. There is clearly a need for the location of individual camp-sites and car parking areas to be well defined to avoid intrusion into and degradation of natural habitat.

Currently, camping grounds are provided at Snake Lagoon and West Bay. The maximum number of sites at each of these will be 8.

An additional small-scale camping ground may be developed at the old Rocky River apiary site, following an assessment of need and potential impact. Camping facilities should be compatible with the natural environment as far as possible and constructed according to best practice design. Camping outside established campsites is discouraged. However, minimum impact camping may be permitted as part of an approved bush trekking program. Bush campers must comply with the *Minimum Impact Code for Wilderness Use in South Australia*.

Cape du Couedic and Cape Borda Areas

Troubridge, Karatta and Parndana Lodges at Cape du Couedic and Flinders Light Lodge and Hartley Hut at Cape Borda, are popular and well patronised. Marketing programs should continue to be developed to increase occupancy, actively promoting them to prospective visitors. Refurbishing and interior decor improvements need to be continued in these cottages in accordance with the heritage conservation management plans, to maintain and improve them without compromising their historic integrity.

Actions	*Priority*	*Duration*
Upgrade the standard of camping sites and facilities at Snake Lagoon and West Bay to provide a maximum of eight booked camp sites.	High	3 years
Provide visitor accommodation and associated facilities at Rocky River headquarters area.	High	5 years
Develop existing cottages in accordance with the heritage management plan and marketing requirements.	Medium	Ongoing

RAVINE DES CASOARS WILDERNESS PROTECTION AREA

Strategies

It is proposed that the camping area at Harveys Return be rationalized, limiting the area to 5 booked sites (24 people maximum). The sites should be screened from one another and day visitors, to provide maximum privacy for the campers, in accordance with best practice and minimum impact.

Bush camping that complies with the *Minimum Impact Code for Wilderness Use in South Australia* will be allowed by permit in the remainder of the area.

Action	*Priority*	*Duration*
Rationalize existing camping facilities at Harveys Return to provide a maximum of five booked sites, ensuring that they are well screened.	High	12 months

KELLY HILL CONSERVATION PARK

Strategies

The cleared area around Grassdale and the South-West River was modified by previous agricultural use and now supports large numbers of kangaroos and wallabies and provides habitat for bush stone-curlews. This area should be designated as a minor development zone to permit the rehabilitation and maintenance of the historic site and to allow the development of day visitor facilities and up to 10 camping sites.

Action	*Priority*	*Duration*
Prepare and implement a development plan for the Grassdale area, providing for:	High	
a) day visitor facilities; and		a) 3 years
b) up to 10 camping sites.		b) 5 years

10.3.3.Guided Tours

Strategies

A significant number of visitors to the reserves receive information and interpretation of the environments from tour operators. In order to ensure that information conveyed by tour operators is both accurate and topical, it is proposed that an education program and interpretive materials be provided for commercial tour operators.

Action	*Priority*	*Duration*
Develop an education program for tour operators and produce an interpretive package for their reference.	High	3 years

FLINDERS CHASE NATIONAL PARK

Strategies

The need for guided tours of New Zealand fur-seal habitat at Admirals Arch and the lighthouse at Cape du Couedic should be determined by undertaking visitor surveys and if viable, introduced and managed as GRT initiatives.

Action	*Priority*	*Duration*
Undertake visitor surveys to determine the need for guided tours of the fur-seal habitat at Admirals Arch and Cape du Couedic lighthouse and if necessary, implement these as a GRT initiative.	Medium	3 years

KELLY HILL CONSERVATION PARK

Strategies

Visitors to the park are concentrated into a few peak periods and times. Island visitation peaks around January, public holidays and school holidays. Peak visitation at the caves in those periods is concentrated as a result of scheduling by tourism operators. Consultants who investigated the demands on the roads of Kangaroo Island have predicted that tourist numbers to the island will virtually double in the next 10 years to the year 2005 (PPK Consultants 1991). If this is correct, cave visitation demand will soon far exceed their carrying capacity.

The karst system, caverns and its speleothems are the attraction to this area and must be protected. During peak visitation times, a maximum of one hundred persons are permitted in the caves at one time. Each group is to be limited to no more than 25 people. As there are four chambers to the cave, a maximum of four simultaneous tours is permissible. This level of visitation diminishes visitor experience and places the formations at risk through physical contact and micro-environmental change such as increases in dust, rise in carbon dioxide level and introduction of lampenflora.

On current usage patterns, there are often more potential visitors than the caves can comfortably accommodate. The only way to cope with this level of visitation is to implement a booking system or encourage appropriate accessible accommodation development. If accommodation facilities are established at the western end of Kangaroo Island, a more equable movement of visitors is likely to result. The present need for visitors to travel from the eastern end of the island results in high visitor loadings in the middle of the day. The sealing of the roads would also allow more people to tour from the present accommodation areas later into the evening.

School groups visiting the caves usually stay at either Karatta, Vivonne Bay, or Flinders Chase. During high-use periods of the year, they should be encouraged to visit the caves at

non-peak times. One possible time is during the evening; and the path from the office to the cave entrance has been illuminated for this purpose. Night visitation could also be provided for tour groups from accommodation facilities which may be developed nearby.

Action	*Priority*	*Duration*
Develop a cave manual for staff and tour guides, incorporating geological processes, safe work practices and training.	High	3 years

10.4. Interpretation

FLINDERS CHASE NATIONAL PARK

Strategies

Visitor information will be provided at a reception facility that will also cater for park administration, interpretation and a retail sales function.

An integrated interpretation plan should be developed that describes the park's natural and historic assets for the public. As indicated in the discussion of tourism and visitor use, there is inadequate information on visitor profiles, visitor expectations and the reasons for the high percentage of short-stay visitors. A comprehensive visitor survey would establish the target audience for the interpretation program and ongoing monitoring of visitors would ensure that the program is appropriately directed. If required by the interpretation plan, such a survey should be undertaken and visitor monitoring programs set in place.

The interpretation plan should include a review of existing interpretation material, including all signage, to ensure consistency and integration with new initiatives. It should also recognise that, although not the major drawcard of the park, cultural history is an aspect which should be highlighted through appropriate interpretation.

Natural features such as Remarkable Rocks and Admirals Arch are justifiably renowned and may be the sole reason for many people's visit to the park. There is a public expectation that Flinders Chase is a place of natural beauty where wildlife can be observed. These attributes should be adequately interpreted. The interpretation plan should allow for on-site interpretation at the park's major attractions; including Remarkable Rocks, Admirals Arch, the Rocky River area, platypus viewing areas and wilderness areas. Interpretation should also be provided for areas of cultural significance, including Cape du Couedic lighthouse precinct, Cape Borda lighthouse precinct and the Cape Borda museum.

For many visitors, tour operators are the prime source of information about the park. It is therefore important that their information is accurate and interesting. Close communication between DEHAA staff and bus tour operators will be maintained and operators kept informed of new developments, events and issues in the park. From time to time, DEHAA staff should run courses for tour operators and other interested people involved in the tourist industry on the island to assist them in their role as park interpreters. The courses should convey sound conservation principles and provide accurate and topical information on the park and its resources. A suitable reference package should be provided for these operators.

Continued use of the park by school groups should be encouraged. Most teachers have pre-determined programs for their students, which may involve some input by DEHAA field staff. While it is not proposed that field staff should be involved in the design of school groups' programs, field staff should continue to be available as an information and interpretation resource for school groups. The interpretation plan should address appropriate concepts and themes for which the park is a suitable educational venue.

Actions	*Priority*	*Duration*
Prepare and implement an interpretation plan for the park, providing for:		
a) on site interpretation at Remarkable Rocks and Admirals Arch;	a) High	a) 1 year
b) in association with the district walking trail development plan, interpretive brochures for Breakneck River, Sandy Creek, Rocky River walks and the coastal walk from Cape Borda to Kelly Hill Conservation Park;	b) High	b) 3 years
c) a saleable booklet on the walking trails of the park using the individual walking trail brochures; and	c) High	c) 3 years
d) an interpretive plan for the Cape Borda Museum visitor centre.	d) Medium	d) 5 years
Undertake any necessary visitor surveys to establish visitor profiles.	Medium	Ongoing
Ensure that tour operators are provided with accurate and appropriate information and interpretive materials.	High	12 months

RAVINE DES CASOARS WILDERNESS PROTECTION AREA

Strategies

An interpretation plan for the area will be prepared and implemented, aiming to inform visitors of the importance of protected wilderness. The target audience for interpretation should be determined by undertaking a visitor survey. On-site interpretation at West Bay, Ravine des Casoars and Harveys Return should be included as part of this interpretation plan.

It is proposed that a self-guided driving tour be developed for Shackle Road that will ensure a widespread interpretation of wilderness protection areas.

Interpretive brochures should be prepared for all walking trails proposed in the District Walking Trail Development Plan (in preparation) and incorporated in a saleable booklet on the walking trails of the area.

Many visitors to the wilderness protection area rely on the information provided by commercial tour operators. A course on interpretation and an interpretive package should be made available to commercial tour operators to ensure that the information they disseminate is compatible with wilderness management.

Actions	*Priority*	*Duration*
Develop and implement an integrated interpretation plan for the park, incorporating:	High	3 years
a) on site interpretation at West Bay, Ravine des Casoars, Bullock Waterhole and Harveys Return; and		
b) interpretive brochures for Breakneck River, Sandy Creek, Rocky River walks and the coastal walk from Cape Borda to Kelly Hill Conservation Park		
Run a course on interpretation for tour operators and produce an interpretive package for their reference.	High	3 years
Undertake any necessary visitor surveys to establish visitor profiles.	Medium	Ongoing

KELLY HILL CONSERVATION PARK

Strategies

An integrated interpretation plan should be prepared for the park, incorporating:

- a description of the park's natural and historic features;
- guided tours of karst features;
- guided and unguided tours of other natural features;
- interpretive materials for educational groups;
- interpretive and directional signs;
- brochures and fliers;
- interpretive displays; and
- staff training and development.

Interpretive activities conducted by the guides must be scientifically accurate and should be modified to suit the specific needs of individual groups. To achieve this, staff development and training programs for the cave guides should be provided. In addition, a cave guide manual should be developed, incorporating karst geomorphology, geology, hydrology, speleothem formation, history, safe work practices and training.

Lights in the show cave should be developed and maintained to emphasise the natural features of the caverns and speleothems, while providing safe illumination.

Specific brochures need to be prepared to provide information to the public. Visitors should be encouraged to use the walking trails in the park, either before or after their tour of the show cave.

Actions	*Priority*	*Duration*
Prepare an interpretive display plan for the Kelly Hill Conservation Park visitor centre and implement plan.	High	3 years
Prepare and implement an interpretation plan for the park.	Medium	5 years
Undertake any necessary surveys to establish visitor profiles.	Medium	Ongoing

CAPE BOUGUER WILDERNESS PROTECTION AREA

Strategies

An interpretation plan for the area will be prepared and implemented, aiming to inform visitors of the importance of protected wilderness. The target audience for interpretation should be determined by undertaking a visitor survey. On-site interpretation at Kelly Hill Conservation Park visitor centre, Grassdale and Hanson Bay should be included as part of this interpretation plan.

Actions	*Priority*	*Duration*
Prepare and implement an interpretation plan for the area.	Medium	5 years
Provide interpretation at Kelly Hill Conservation Park visitor centre, Grassdale and Hanson Bay adjacent to the walking trail, as part of the interpretation plan.	High	12 months
Undertake any necessary surveys to establish visitor profiles.	Medium	Ongoing

10.4.1.Signage

FLINDERS CHASE NATIONAL PARK AND KELLY HILL CONSERVATION PARK

Strategies

A sign plan should be prepared and implemented for the parks, including a database recording the locations and photographs of all signs. The database is to include specifications, historic costs and required maintenance programs.

Actions	*Priority*	*Duration*
Record and enter in a database locations of and photographs of all park signs. The database is to include specifications, historic costs and required maintenance programs.	High	12 months
Erect signs on fire trails to restrict access to walkers and management vehicles only.	High	12 months

RAVINE DES CASOARS AND CAPE BOUGUER WILDERNESS PROTECTION AREAS

Strategies

A sign plan for the wilderness protection areas should be prepared and implemented, including the recording and entry in a database the locations of and photographs of all signs. The database is to include specifications, historic costs and required maintenance programs. "Wilderness Protection Area" signs should be erected at access points and trail heads.

Action	*Priority*	*Duration*
Prepare and implement a sign plan for the area, including "Wilderness Protection Area" signs at access points and trail heads.	Medium	12 months

10.5. Access

10.5.1.Roads

Strategies

Roads, tracks and trails will be maintained to a standard which allows safe access to vehicles and/or walkers. To facilitate public access to sites of interest and to representative areas of the park, it is proposed that existing all-weather roads be maintained and that any necessary roadworks and minor realignments be undertaken to ensure public safety.

Actions	*Priority*	*Duration*
Maintain roads to an all-weather standard.	High	Ongoing
Assess and monitor disused and abandoned borrow pits. Where appropriate, undertake rehabilitation works to arrest degradation; otherwise, allow them to rehabilitate naturally.	High	10 years

FLINDERS CHASE NATIONAL PARK

Strategies

The road to Rocky River headquarters and Cape du Couedic and Boxer Drive to Remarkable Rocks will be upgraded, realigned for safety reasons and sealed.

In order to maintain roads in the park in good condition, construction materials will need to be obtained from time to time. Ideally these should be obtained from outside the park. Importation of road materials must be subject to a thorough investigation into the presence of *Phytophthora cinnamomi* and potential pest plants.

Other than the realignment of existing roads as specified in this document, no construction of new roads will be undertaken during the term of this management plan.

1. Council Roads
   The major council roads adjacent to the park (Playford Highway, West End Highway and the Gosse-Ritchie Road) should continue to be maintained by the Kangaroo Island Council because of their status as major service roads. DEHAA should maintain close contact with Council to ensure that their management of roadside vegetation along these roads is compatible with management of vegetation within the park.

   There are a number of road reserves fully contained within, or adjoining the park, that should be closed under the *Roads (Opening and Closing) Act* so that their land area may be added to and managed as part of the park.

2. Cape du Couedic Road
   The main Cape du Couedic Road is to be upgraded to bitumen standard. While conforming to Australian Standards, minimum shoulders and verges should be considered in environmentally sensitive areas. The roads constructed in the vicinity of coastal areas, especially Boxer Drive and Cape du Couedic area, are to be of a material sympathetic with the surrounding calcarenite limestone. Colouration of the wearing surface should also be in sympathy with its surroundings. For reasons of safety, minor re-alignment of these roads will need to be undertaken. However, where possible the existing alignment should be maintained.

   The main road to the Admirals Arch car park is to be re-routed to bypass the heritage node at Cape du Couedic and the current road through that area is to be downgraded to provide access for the cottage tenants and management staff only. The disused portion of the road will be rehabilitated. Before implementing this bypass, the Aboriginal Heritage Branch, Native Vegetation Council and State Heritage Branch are to be consulted.

   Turn-around areas will be constructed at strategic sites between Rocky River and Boxer Drive to allow the management of over-sized vehicles in the event of an emergency.

3. West Bay Road and Shackle Road
   West Bay and Shackle Roads are to be maintained to high quality gravel standard.

Actions	*Priority*	*Duration*
Close road reserves within parks where necessary.	High	12 months
Maintain liaison with the Kangaroo Island Council to ensure that their management of roadside vegetation along council roads adjacent to the park is compatible with park management policies.	High	Ongoing
Upgrade the Rocky River entrance road, Cape du Couedic Road and Boxer Drive to bitumen standard.	High	5 years
Manage the importation of road-building materials with regard to the possible presence of *Phytophthora cinnamomi* and potential pest plants.	High	Ongoing
Design and construct a deviation road for day visitors to bypass the Cape du Couedic heritage cottages. Establish a service track to the cottages and revegetate and rehabilitate disused portions of the road.	High	5 years
Resite the entrance road and car park at Remarkable Rocks to a distance that will minimise aesthetic intrusion. Restore the old site to its original condition.	High	5 years

RAVINE DES CASOARS WILDERNESS PROTECTION AREA

Strategies

Roads degrade wilderness by increasing accessibility, removing vegetation, altering drainage, increasing risk of erosion and exotic species and disease invasion and by presenting a visible intrusion on the natural landscape. No additional roads are to be constructed in the area. Except for emergencies and essential management operations, vehicular traffic will be restricted to the boundary roads (namely Playford Highway in the north, West End Highway in the east, West Bay Road in the south) and on Shackle Road and the track from Harveys Return to the Ravine des Casoars.

The speed limit on both Shackle Road and the road from Harveys Return to Ravine des Casoars will be 60 kph.

The track linking West Bay Road with the Ravine des Casoars will remain closed to public vehicles, but maintained as a fire access and emergency services track only. However, visitors will be encouraged to use this closed road as a walking trail or bicycle track through the reserve.

The tracks which allow access to the picnic area and campground at Harveys Return meet the Playford Highway at a site that does not afford a safe view of oncoming traffic. Only one entrance track is required and this needs to be relocated in order to meet Playford Highway at a safe angle.

Actions	*Priority*	*Duration*
Initiate procedures to close road reserves within or adjoining the wilderness protection area where necessary	High	12 months
Close one of the two entrance roads to the picnic area at Harveys Return and relocate the remaining road so that it meets the Playford Highway safely.	Medium	12 months

10.5.2.Car Parks

FLINDERS CHASE NATIONAL PARK

Strategies

The following benchmark for the capacity of carparking at sites on the Cape du Couedic Road was based on visitor survey analysis, consideration of visitor demand and environmental factors. They will be constructed to bitumen standard and are intended to adequately provide for peak visitor periods:

a) Admirals Arch car park - 4 large coaches and 25 cars;
b) Remarkable Rocks car park - 5 large coaches, 4 mini-buses and 25 cars; and
c) Bunker Hill Viewing Area car park - 2 large coaches, or 2 mini-buses and 3 cars.

Actions	*Priority*	*Duration*
Resheet exposed road verge and shoulders with limestone marl, in conjunction with the Cape du Couedic Road upgrade project.	High	12 months
Modify the Admirals Arch car park to accommodate up to 5 large buses, 4 mini-buses and 25 cars.	High	12 months
Develop a car park at Cape du Couedic lighthouse to accommodate 3 large coaches, 10 cars and a toilet facility.	High	12 months
Relocate the Remarkable Rocks car park to a less intrusive site, allowing for a capacity of 5 large coaches, 4 mini-buses and 25 cars and provide a raised boardwalk to a viewing platform for ambient and disabled visitors to view the rocks.	High	5 years
Modify the Remarkable Rocks Viewing Area car park to accommodate 1 large coach or 2 mini-buses and 5 cars.	High	5 years
Modify the Maupertuis Bay Lookout car park to accommodate 2 large coaches or 3 mini-buses or 5 cars.	High	5 years

RAVINE DES CASOARS WILDERNESS PROTECTION AREA

Strategies

Approximately mid-way along Shackle Road, there is a small fresh water soak and swampy area known as Bullock Waterhole which was historically important as a watering point for stock. This feature is visited for both its cultural and natural values. Visitors park on Shackle Road and walk about 50 metres to the site. For safety reasons, it is proposed that a small layby be established for visitors to park their cars when visiting this site.

Breathtaking views of the area are available near to the northern end of Shackle Road. At the road's highest point, it is proposed that a small car park/layby be established to allow visitors to enjoy these views in safety without impeding traffic.

Actions	*Priority*	*Duration*
Establish a small car park/layby at the Bullock Waterhole walking trail to increase visitor safety and reduce degradation from uncontrolled car parking.	High	12 months
Establish a small layby at the highest point on Shackle Road, overlooking Flinders Chase National Park and Ravine des Casoars Wilderness Protection Area.	Medium	5 years

KELLY HILL CONSERVATION PARK

Strategies

After a consideration of environmental factors and visitor demand based on analysis of visitor surveys, the car parking facilities at Kelly Hill day visitor centre will be upgraded to adequately provide for peak visitor periods. The benchmark capacity for this car park will be for 4 large coaches, 4 mini-buses and 25 cars.

Action	*Priority*	*Duration*
Upgrade the car parking facilities at Kelly Hill Conservation Park day visitor area to accommodate 4 large coaches, 4 mini-buses and 25 cars.	High	12 months

10.5.3.Airstrip

FLINDERS CHASE NATIONAL PARK

Strategies

The airstrip within Flinders Chase National Park should be maintained for emergency and special purpose use only.

Rehabilitation and protection works should be undertaken in order to minimise erosion from excessive run-off and to minimise weed invasion.

Action	*Priority*	*Duration*
Rehabilitate eroded areas to the south of the airstrip to prevent further erosion.	High	3 years

10.6. Alien Tenures

FLINDERS CHASE NATIONAL PARK

Strategies

Leases over alien tenures in the park should provide the best possible protection for the park and not significantly impose on the department's resources and staff.

Construction work related to these leases should be consistent with standards acceptable to the Department for Environment, Heritage and Aboriginal Affairs and no work should proceed without prior approval of the department.

Lessees over alien tenures within the park are afforded various rights. Some of these require special management considerations. Lease fees should reflect the cost of administration and the provision of services.

University of Adelaide Field Station

The University of Adelaide leases a site for a field station at Rocky River headquarters area on a three year basis. The lease arrangements will need to be reviewed in the context of the redevelopment of the Rocky River headquarters area. Consultation with the University of Adelaide should occur prior to any changes to existing arrangements.

Cape du Couedic and Cape Borda Lighthouses

The lighthouses at Cape du Couedic and Cape Borda and the small areas immediately surrounding them are owned and operated by the Australian Maritime Safety Authority (AMSA). The Department for Environment, Heritage and Aboriginal Affairs should maintain close contact with AMSA to ensure that any proposed changes to their

installations or any construction work associated with them are not detrimental to the park and are in accordance with the park's heritage conservation management plan.

Rocky River Gauging Station

The Water Resources Group and Heritage and Biodiversity Division within DEHAA will coordinate the ongoing management of the water gauging station, especially with regards to development.

Action	*Priority*	*Duration*
The lease over the University of Adelaide Field Station should be for no more than three years, to be reviewed in the context of the development plan for Rocky River headquarters area.	High	Ongoing

10.7. Additional Land

Steps should be taken to acquire suitable and available land adjoining the reserves which would contribute to the conservation of native vegetation and fauna and to the cultural heritage of Kangaroo Island. The following areas have been identified as being suitable additions:

FLINDERS CHASE NATIONAL PARK AND KELLY HILL CONSERVATION PARK

Strategies

Part Section 14, Hundred of McDonald

Section 14 extends from the South Coast Road to the coast and separates Flinders Chase from Kelly Hill Conservation Park (Figure 2). It comprises an area of 4,203 hectares.

Substantial areas of this Section have been cleared for cultivation. However, a considerable area of native vegetation remains and it is unlikely to be cleared for cultivation because of the presence of extensive calcrete outcrops. Retention of the native vegetation on Section 14 links the ecosystems of the two parks and ensures the retention of a corridor for the movement of native animals. It is proposed that the uncleared portion of Section 14, described in DP 25953, should be purchased as an addition to the park. Additionally, the coastal reserve, Section 19, Hundred of McDonald, should be purchased at the same time. As the purpose of acquiring this land is for its conservation value, there is no immediate plan to develop it. It would therefore be managed for the conservation of vegetation, fauna and landscape values.

By purchasing Part Section 14 DEHAA would not be able to gain control over all of the area between Flinders Chase and Kelly Hill. A small area of 0.3 hectares at the mouth of the South-West River is privately owned and zoned for shack development. The council road which links the South Coast Road with Hanson Bay would need to remain as a public road to allow unrestricted public access to the shack area. In addition, the present owner of Section 14 has constructed holiday cabins on the coast to the west of the South-West River and the future of these buildings in the event of purchase of Section 14 remains unclear.

Kelly Hill Conservation Park is managed as part of the Flinders Chase National Park unit within the Kangaroo Island West District. As the overall management for the area is administered from the headquarters at Rocky River in Flinders Chase National Park, Kelly Hill Conservation Park should be re-proclaimed as part of Flinders Chase National Park.

Additional reasons for the move are as follows:

- Physically, Kelly Hill Conservation Park and Flinders Chase National Park are similar in character. They include different areas of vegetation associations and animals but, together with proposed additions, they form one large contiguous area of native vegetation at the western end of Kangaroo Island.
- Historically they were managed as one entity. The original dedication of Kelly Hill Caves was under the care and control of the Fauna and Flora Board, which also controlled Flinders Chase.
- National parks include extensive areas of native vegetation, spectacular scenery and formations and sites of historic interest and national importance. The combination of Kelly Hill Conservation Park into Flinders Chase National Park strengthens Flinders Chase National Park's claim to be one of the most significant national parks in Australia.

It is therefore proposed for practical, historical and environmental reasons that Kelly Hill Conservation Park be amalgamated with Flinders Chase National Park.

Foreshore

The foreshore adjoining the park should be included to extend the park to low water mark.

Actions	*Priority*	*Duration*
Take steps to purchase the uncleared area of Section 14, Hundred of McDonald, to link Flinders Chase National Park and Kelly Hill Conservation Park, but excluding the developed areas noted in the Management Considerations section.	High	3 years
Ensure that Section 19, Hundred of McDonald, the coastal reserve adjacent to Section 14, is added to the park at the same time and also include the foreshore adjoining the park.	High	3 years
Take steps to alter the boundaries of Flinders Chase National Park so that they extend to low water mark.	High	12 months

KELLY HILL CONSERVATION PARK

Strategies

In addition to Section 14, Hundred of McDonald mentioned above, three parcels of land are proposed as suitable for addition to the park (Figure 2):

1. Section 1, Hundred of Ritchie;
2. Section 49, Hundred of Ritchie; and
3. road reserve between Sections 9 and 10, Hundred of Ritchie.

Sections 1 and 49, Hundred of Ritchie, contain extensive areas of native vegetation and river flats associated with the Stunsail Boom River (Figure 2).

Section 1, Hundred of Ritchie, has been divided into twelve allotments of 30 hectares each. Unlike the concentrated shack and cabin area at Hanson Bay, the sale of these blocks for individual shacks could pose a serious fire problem. Access to the blocks is along a rough private road and speedy evacuation would be impossible.

Since the wetlands of the Stunsail Boom River provide an excellent natural fire break, extension of the park to this area will make fire protection of the park and local community easier. The rare Kangaroo Island trigger plant (*Stylidium tepperanum*) is known to occur in this area. Provided no major developments have taken place in the subdivision in Section 1 Hundred of Ritchie, this area between the park's eastern boundary and the Stunsail Boom River should be purchased for addition to the park. Section 49 is the coastal strip adjacent to Section 1.

There is a surveyed road reserve between Sections 9 and 10, Hundred of Ritchie, although it is *de facto* part of the park. The road reserve should be officially closed (and included in the park) under the *Roads (Opening and Closing) Act*.

Actions	*Priority*	*Duration*
Take steps to close the road reserve between Sections 9 and 10, Hundred of Ritchie under the *Roads (Opening and Closing) Act 1991* and initiate procedures to close road reserves within or adjoining parks where necessary.	High	12 months
Take steps to purchase Sections 1 and 49, Hundred of Ritchie.	High	3 years

CAPE BOUGUER AND RAVINE DES CASOARS WILDERNESS PROTECTION AREAS

Strategies

Foreshore

The foreshore adjoining the areas should be included to extend wilderness protection to low water mark.

Action	*Priority*	*Duration*
Take steps to alter the boundaries of Cape Bouguer and Ravine des Casoars Wilderness Protection Areas so that they extend to low water mark.	High	12 months

11.FIRE MANAGEMENT

People and built assets within the reserves and on neighbouring land must be protected from fires . Fires threatening environmental assets will be managed to protect the integrity of ecosystems and for the maintenance of biological diversity.

11.1. Fire Management Plan

Strategies

1. Fire management plans will be prepared for each reserve in consultation with the Kangaroo Island Bushfire Prevention Committee and the Kangaroo Island Country Fire Service Group.
2. Fire management plans will incorporate fire management zones which identify and define areas of environmental significance, built assets and areas of high visitation which require specific management objectives and prescriptions.
3. Research will be undertaken into the effects of fire on all ecosystems within the park, including benchmark biological surveys and ongoing monitoring. Wherever possible, research will be undertaken in a consultative manner on a regional basis. The results of this research will be used to guide future management planning.
4. Fire management will be based on continuing research into the fire history of the area, the relationships between fire and the natural communities occurring within the area and on the maintenance of biological diversity. Fire suppression strategies should be consistent with the maintenance of biological diversity.
5. Fire management will include the restoration and rehabilitation of areas adversely impacted as a result of fire or fire suppression activities.

Actions	*Priority*	*Duration*
Implement recommendations in the *Draft Flinders Chase National Park Fire Prevention Plan* while protecting the values of the park.	High	Ongoing
Review the effectiveness of the *Draft Flinders Chase National Park Fire Prevention Plan* in the light of any wildfires which may occur in the park.	High	Short
Prepare fire management plans for fire fighting operations in the park.	High	3 years
Wherever possible, undertake fire management measures to protect all stands of drooping sheoaks and aged sugar gums, the habitat of glossy black cockatoo.	High	Ongoing
Where appropriate, undertake an inventory of flora and fauna in any area in which prescribed fuel-reduction burning is intended to be implemented and monitor and assess the impact of any such burning on flora and fauna.	High	Ongoing

RAVINE DES CASOARS WILDERNESS PROTECTION AREA

Strategies

The general principles in the *Draft Flinders Chase National Park Fire Prevention Plan* (DENR 1991a) provide the basis for fire management of Ravine des Casoars Wilderness Protection Area. However, specific issues relating to fire prevention and management will be dealt with in a specific fire prevention plan for Ravine des Casoars Wilderness Protection Area.

The plan is intended to protect people, assets of the wilderness protection area and

neighbouring properties from the effects of fires. In addition to the protection of people and capital assets, the plan identifies two areas of particular significance which require special protection from fire. These are:

1. Areas of drooping sheoak (*Allocasuarina verticillata*) and sugar gum (*Eucalyptus cladocalyx*) in the western areas of the area, which are the habitat of the glossy black cockatoo (*Calyptorhynchus lathami*); and
2. Kangaroo Island mallee ash (*Eucalyptus remota*), which is endemic to the western areas of Kangaroo Island and is well represented in the area.

The plan states that the Department for Environment, Heritage and Aboriginal Affairs, in consultation with local CFS personnel, will decide on the allocation of resources to be used in controlling wildfires. It provides a rationale and a program for fire prevention works and details the resources and logistics for fire-fighting operations. Only if a wildfire is likely to endanger visitors, area facilities, or neighbouring properties would large-scale fire control measures be undertaken. Generally, where practicable, wildfires will be allowed to travel their natural course.

The 5 metre-wide access track linking West Bay Road to the Shackle Road and the airstrip and across to the West End Highway will be graded and trittered for 10 metres on either side. The West Bay Road will be trittered to a width of 2 metres on either side and the existing firebreak on both sides of the Shackle Road will be rolled to 20 metres wide. A 5 metre-wide access track will be maintained adjacent to the Playford Highway west of the West End Highway turn-off and adjacent to the West End Highway. A 20 metre-wide rolled firebreak will be maintained along the highways.

Fuel-reduction burning is proposed within the 20 metre firebreak along the Playford and West End Highways to form a fuel-reduced buffer zone to neighbouring properties. No further fuel-reduction burning is contemplated and the plan does not prescribe the use of fire as a tool for the management of ecosystems unless research indicates that there will be a substantial benefit to ecosystems.

DEHAA will prepare a fire prevention plan for Ravine des Casoars Wilderness Protection Area in consultation with the public.

Actions	*Priority*	*Duration*
Prepare a fire prevention plan for Ravine des Casoars Wilderness Protection Area that incorporates historic, current and planned future works and the protection of wilderness values.	High	12 months
Review the effectiveness of the fire prevention plan following any wildfires which occur in the area.	High	Ongoing
Undertake fire-suppression measures to protect the habitat of glossy black cockatoo (stands of drooping sheoaks and aged sugar gums).	High	Ongoing
Undertake an inventory of flora and fauna in any area in which prescribed fuel-reduction burning is intended to be implemented and monitor and assess the effects of burning on flora and fauna.	High	Ongoing

KELLY HILL CONSERVATION PARK

Strategies

The *Draft Kelly Hill Conservation Park Fire Prevention Plan* (DENR 1991b) has been prepared and will be adopted following public consultation. The objectives of the plan are to protect life, fixed and biological assets of the park and neighbouring properties from the effects of fires. Generally, where considered safe and if practicable, wildfires will be

allowed to travel their natural course.

The fire prevention plan provides a rationale and a program for fire prevention works and details the resources and logistics for fire-fighting operations. In accordance with the plan, the Department for Environment, Heritage and Aboriginal Affairs will decide on the allocation of resources to be used in controlling wildfires and when appropriate, local CFS personnel will be consulted. The plan does not prescribe the use of fire as a tool for the management of ecosystems in the park, unless research indicates that there will be substantial benefits to ecosystems.

In the event of a wildfire, the fire prevention plan should be reassessed and reviewed if necessary.

Actions	*Priority*	*Duration*
Implement recommendations in the adopted *Kelly Hill Conservation Park Fire Prevention Plan* while protecting wilderness values of the park as discussed in this plan.	High	Ongoing
Review the effectiveness of the fire prevention plan following any wildfires which occur in the park.	High	Ongoing
Undertake an inventory of flora and fauna in any area in which prescribed fuel-reduction burning is intended to be implemented and monitor and assess the effects of burning on flora and fauna.	High	Ongoing

CAPE BOUGUER WILDERNESS PROTECTION AREA

Strategies

The general principles in the *Draft Kelly Hill Conservation Park Fire Prevention Plan* (DENR 1991b) provide the basis for fire management of Cape Bouguer Wilderness Protection Area. However, a fire prevention plan for Cape Bouguer Wilderness Protection Area will be prepared with public consultation, addressing specific fire prevention and management issues for the area.

The plan is intended to protect people, assets of the wilderness protection area and neighbouring properties from the effects of fires. Generally, where considered safe and if practicable, wildfires will be allowed to travel their natural course.

The fire prevention plan provides a rationale and a program for fire prevention works and details the resources and logistics for fire-fighting operations. In accordance with the plan, the Department for Environment, Heritage and Aboriginal Affairs will decide on the allocation of resources to be used in controlling wildfires and when appropriate, local CFS personnel will be consulted. The plan does not prescribe the use of fire as a tool for the management of ecosystems in the area, unless research indicates that there will be substantial benefits to ecosystems.

Actions	*Priority*	*Duration*
Prepare a fire prevention plan for Cape Bouguer Wilderness Protection Area that incorporates historic, current and planned future works and the protection of wilderness values.	High	12 months
Review the effectiveness of the fire prevention plan following any wildfires which occur in the area.	High	Ongoing

12.BIBLIOGRAPHY

Australia International Council on Monuments and Sites (1988) *The Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (The Burra Charter),* adopted 1979, revised 1981 and 1988.

Davies R J-P (1986) *Threatened Plant Species of the Mount Lofty Ranges and Kangaroo Island Regions of South Australia,* Conservation Council of South Australia Inc, Adelaide.

DEHAA (in prep.) *Protected Areas of Western Kangaroo Island - Background Information,* Department for Environment, Heritage and Aboriginal Affairs, Adelaide.

DEHAA (in prep.) *A Biological Survey of Kangaroo Island South Australia,* Department for Environment, Heritage and Aboriginal Affairs, Adelaide.

DENR (1991a) *Flinders Chase National Park Fire Prevention Plan*, Department of Environment and Natural Resources, Adelaide.

DENR (1991b) *Draft Kelly Hill Conservation Park Fire Prevention Plan,* Department of Environment and Natural Resources, Adelaide.

DENR (1991c) *Policy to Manage Public Access to Caves within DENR Reserves in South Australia*, Department of Environment and Natural Resources, Adelaide.

Department of Conservation and Land Management (1998) *Flinders Chase National Park Rocky River Draft Master Plan*, Recreation Planning and Design Section, CALM, Perth.

Dixon S (1920) *The Full Story of Flinders Chase, Kangaroo Island South Australia,* Royal Society of South Australia (Field Naturalist Section), Hussey & Gillingham Ltd, Adelaide.

Geological Society of Australia (SA Division) (1984) *Geological Monuments in South Australia.*

Laut P, Heyligers P C, Keig G, Löffler E, Margules C, Scott R M and Sullivan M E (1977) *Environments of South Australia Province 3 Mount Lofty Block,* CSIRO, Canberra.

Leigh J, Briggs J and Hartley W (1981) *Rare or Threatened Australian Plants*, Australian National Parks and Wildlife Service Special Publication No 7, ANPWS, Canberra.

Lesslie R and Taylor S (1983) *Wilderness in South Australia*, Centre for Environmental Studies, University of Adelaide, Occasional Paper No 1.

PPK Consultants (in association with KPMG Peat Marwick) (1991) *Tourism Road Evaluation - Kangaroo Island: Final Report*, PPK Consultants, Adelaide.

Robinson A C, Canty P, Mooney T and Rudduck P (1996) *South Australia's Offshore Islands*, Department of Environment and Natural Resources, Adelaide.

APPENDIX I

CODE OF MANAGEMENT
FOR WILDERNESS PROTECTION AREAS AND ZONES SOUTH AUSTRALIA

1. INTRODUCTION

1.1 This Code is the Wilderness Code of Management prescribed in the *Wilderness Protection Act 1992*.

1.2 Any terms used in this Code have the same meaning as those used in the *Wilderness Protection Act* and the *National Parks and Wildlife Act 197*2.

1.3 A wilderness area means land constituted under the *Wilderness Protection Act, 1992* as a Wilderness Protection Area or Wilderness Protection Zone.

2. OBJECTIVES OF WILDERNESS MANAGEMENT

2.1 To maximise the naturalness and remoteness, i.e. the wilderness quality, of wilderness areas and in particular:

(i) protect and, where practicable, enhance wilderness quality;
(ii) protect wildlife and ecological processes;
(iii) control and, where practicable, eradicate non-indigenous plants and animals;
(iv) protect geographical features;
(v) protect sites of scientific significance;
(vi) protect sites of historical significance;
(vii) protect sites of Aboriginal cultural significance;
(viii) provide for public use and enjoyment where compatible with maximising wilderness quality; and
(ix) promote public awareness of and education in, the natural features of and proper use of wilderness protection areas and wilderness protection zones.

3. MANAGEMENT PRINCIPLES

3.1 General Principles

(i) All management operations will be carried out in a manner consistent with maximisation of wilderness quality except where provided for in this Code (see 3.10).

(ii) A Plan of Management will be prepared for a designated wilderness area as soon as practicable after the area's constitution. The Plan will provide clear direction for the protection and management of the wilderness area, in particular:

(a) proposals to achieve the management objectives (2 above);
(b) priorities for actions, including:
- the removal of existing incompatible uses and/or structures except those permitted under this Code; and
- appropriate rehabilitation to be undertaken following the removal of structures and incompatible uses;

(c) recognition of the need to review management if indicated by results of monitoring and research;

(iii) No additional incompatible uses and/or structures will be permitted except those provided for in this Code.

(iv) Nothing in this Code derogates from any rights exercised in mining tenements in wilderness protection zones. In relation to mining operations in wilderness protection zones, environmental protection policies in section 5 of this Code will apply.

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3.2 Access and Transport

(i) The use of vessels, motorised or wheeled transport will be permitted only on prescribed access routes and for emergency and essential management operations (see 3.10) when alternative measures which do not degrade the wilderness quality of an area are unavailable.

(ii) Access routes may be prescribed in a plan of management for use by vessels, motorised or wheeled transport in circumstances where this type of transport is essential for effective management.

(iii) Construction of vehicle or walking tracks will be permitted only where re-direction of existing access requires construction of alternative tracks or for management works to achieve objectives identified in a plan of management. The construction of vehicle tracks for specific operations as provided for under 3.6(vi), 3.10 and 5.0 may be permitted on the basis that they will be rehabilitated as soon as possible.

(iv) Vehicle and walking tracks that are not essential for management purposes as specified in 3.10, or for mining operations in wilderness protection zones (see 5.0) will be closed and rehabilitated as prescribed in a plan of management.

(v) Over-flying for recreational purposes under an altitude of 1500m above ground level will be prohibited.

(vi) The landing of aircraft will be prohibited, except by permission of the Director and for emergency and essential management operations. Helipads and airstrips that are identified as essential for emergencies and management operations will be maintained. All other strips or helipads will be rehabilitated as soon as possible or allowed to regenerate naturally.

3.3 Tourism

(i) Commercial tours may be accommodated where their size and planned activities are compatible with maintenance of wilderness quality. Those permitted will have obtained a licence and will be conducted in accordance with licence conditions, the Visitor Management Strategy for the wilderness area (see 3.4) and the Minimum Impact Code (see 6.0). Tour groups will be monitored and regulated where necessary to prevent significant adverse impacts on wilderness quality and opportunities for solitude.

3.4 Recreation

(i) The level and type of visitor use and visitor conduct will be managed in accordance with the objectives stated in section 2 of this Code.

(ii) A visitor management strategy that specifies an acceptable level and type of visitor use and visitor conduct will be included in the management plan for each wilderness area.

(iii) Visitor management strategies will include the promotion of the Minimum Impact Code and the distribution of any information about the wilderness values of particular wilderness areas.

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The following information should be used as a basis for monitoring the effectiveness of each strategy:

(a) the long-term limits of acceptable change for environmental (wilderness quality) and social (opportunities for wilderness dependent experiences) conditions within the wilderness area; and

(b) change in environmental and social conditions within the wilderness area.

(iv) Constructed walking tracks, signs, track markers and other management devices or structures will be used only for essential management operations (see 3.2(ii) and 3.10).

(v) Recreation will be in accordance with the Wilderness Regulations and the Minimum Impact Code.

3.5 Cultural Heritage

(i) Places, sites and objects of significance to Aboriginal people are protected under State and Commonwealth Aboriginal heritage legislation.

(ii) Access by Aboriginal people to their sites of significance and protection of these sites will, as far as possible, be by methods compatible with the maintenance of wilderness quality.

(iii) Nothing in this Code prevents Aboriginal people from doing anything in relation to Aboriginal sites, objects or remains in accordance with Aboriginal tradition. Furthermore, this Code does not prevent the taking, by Aboriginal people, of native plants, protected animals, or the eggs of protected animals, in accordance with the relevant provisions in the National Parks and Wildlife Act.

(iv) Sites of historic significance will be conserved, using access and methods compatible with maintenance of wilderness quality in the long-term.

(v) Non-Aboriginal structures and artefacts that are of no historic significance, as determined by the relevant authority, will be removed or allowed to deteriorate naturally. Removal will not be undertaken if the only method of removal significantly reduces wilderness quality in the long-term.

3.6 Fire

(i) Fire management will be based on continuing research into the fire history of the area, the relationships between fire and the natural communities occurring within the area and on the maintenance of wilderness quality.

(ii) Deliberately lit fires will be used only in emergency situations and in essential management operations as listed in 3.10 and subject to (i) above.

(iii) Other human caused fires should, where practicable, be extinguished consistent with maintenance of wilderness quality.

(iv) Naturally caused fires will be extinguished when, in view of the direction, intensity and extent of the fire and the fire suppression techniques available, they pose a threat to human life and property and to habitats requiring protection.

(v) Where fire suppression action is required, the methods utilised will be, wherever possible, those which will have the least long-term impact on wilderness quality.

(vi) The use of heavy machinery for fire suppression within a wilderness area will be prohibited except:

(a) where it is considered to be the only way of preventing greater long-term loss of wilderness quality;

(b) where specific machinery use techniques, that do not result in significant

disturbance to the landscape or create a new access network, are considered the only feasible method of preventing long-term loss of wilderness quality; or

(c) to mitigate hazard to human life, where alternative measures which do not impact on the wilderness quality of the area are unavailable.

(vii) Wherever possible, fire management practices designed to protect land adjacent to or within a wilderness area will be conducted outside the wilderness area.

3.7 Research

(i) Research that will contribute to the implementation of the objectives of wilderness management will be encouraged.

(ii) Research that will not affect wilderness quality and cannot be carried out elsewhere may be permitted.

(iii) Research not covered under (i) and (ii) will not be permitted.

3.8 Biological Conservation

(i) Management of threatened species, communities and habitats will, as far as possible, be consistent with maintenance of wilderness quality.

(ii) Action will be taken to maintain and, where possible, restore natural processes, communities and habitats.

3.9 Non-indigenous Species

(i) Non-indigenous species which significantly affect the wilderness quality of a wilderness area will be controlled or eradicated.

(ii) Action will be taken to prevent the establishment of non-indigenous species.

3.10 Emergency and Essential Management Operations

(i) All emergency and essential management operations will be carried out with the least possible impact on wilderness quality.

(ii) Actions that cause short-term degradation of wilderness quality but are necessary for emergency and/or essential management operations will be permitted. The only specific situations acknowledged in this Code as possibly requiring such actions are:

- control or eradication of non-indigenous species;
- conservation of threatened species, communities and habitats;
- protection of fire-sensitive species and communities;
- management of visitor use;
- management action or use of devices to mitigate hazard to human life;
- restoration of natural processes, communities and habitats; and
- research

Where degradation has occurred as a result of these activities, rehabilitation will be undertaken as soon as practicable.

3.11 Wilderness Protection Zones

Protection of wilderness quality in wilderness protection zones will be negotiated with tenement holders on the basis of the environmental protection policies in section 5. Management undertakings will be incorporated in a plan of management.

4. EXTERNAL INFLUENCES

4.1 Close liaison with adjoining landholders and managers will be established to ensure that adverse impacts on the wilderness quality of an area resulting from activities outside that area are minimised or prevented.

APPENDIX I

4.2 Where a wilderness area does not comprise a whole catchment, close liaison with upstream landholders and relevant authorities will be established to encourage the maintenance of water quality and flow regimes as close as practicable to their natural state.

4.3 Wherever possible management activities essential to the maintenance of the wilderness quality of a wilderness area to be on land outside the wilderness area.

5. EXERCISE OF MINING RIGHTS IN WILDERNESS PROTECTION ZONES

The holder of a mining tenement shall:

5.1 have regard to the provisions of the plan of management under section 31 of the Wilderness Protection Act; and

5.2 in undertaking any operations:

(i) protect native flora and fauna;
(ii) avoid the pollution of land, water and air;
(iii) avoid disturbance to known sites of natural, scientific, Aboriginal and non-Aboriginal cultural significance;
(iv) minimise the potential for wind and water erosion;
(v) avoid unnecessary track creation;
(vi) avoid introduction of non-indigenous species;
(vii) establish environmental monitoring and rehabilitation programs; and
(viii) upon completion of the operation remove or obliterate all structures and materials used in the carrying out of mining operations.

APPENDIX II

Plants of particular conservation significance within Flinders Chase National Park, Kelly Hill Conservation Park, Ravine des Casoars Wilderness Protection Area and Cape Bouguer Wilderness Protection Area

(Codes explained at end)

TAXON	AUS	SA	KI	RESERVES
Acacia retinodes var. *uncifolia*		U	U	FC, RdC
Achnophora tatei	R	R	R	FC, RdC
Acrotriche depressa		U	U	KH, CB, FC, RdC
Acrotriche fasciculiflora		U	R	FC, RdC
Acrotriche halmaturina		U	U	KH, CB, FC, RdC
Adiantum aethiopicum		K	R	KH, CB, FC, RdC
Ajuga australis form B		K	V	FC, RdC
Alternanthera denticulata		K	R	FC, RdC
Aphanes australiana		K	U	FC, RdC
Aphelia gracilis		Q	R	FC, RdC
Argentipallium obtusifolium		K	R	FC, RdC
Asperula euryphylla var *tetraphylla*		V	V	FC, RdC
Asterolasia muricata	R	R	R	KH, CB, FC, RdC
Asterolasia phebalioides	V	V	V	FC, RdC
Baeckea ericaea		K	U	KH, CB, FC, RdC
Bauera rubioides		R	R	FC, RdC
Baumea acuta		R	R	FC, RdC
Baumea arthrophylla		K	U	KH, CB, FC, RdC
Baumea gunnii		R	E	FC, RdC
Baumea juncea		K	R	FC, RdC
Baumea laxa		R	K	FC, RdC
Baumea rubiginosa		U	R	FC, RdC
Baumea tetragona		U	R	FC, RdC
Billardiera bignoniacea		U	U	KH, CB, FC, RdC
Billardiera procumbens		R	R	FC, RdC
Billardiera versicolor		U	R	FC, RdC
Blechnum nudum		R	R	FC, RdC
Blechnum wattsii		R	R	FC, RdC
Boronia parviflora		R	R	FC, RdC
Brachycome exilis		K	U	FC, RdC
Brachycome goniocarpa		K	U	FC, RdC
Burchardia umbellata		K	U	KH, CB, FC, RdC
Caladenia minor		R	R	FC, RdC
Caladenia valida	R	R	R	KH, CB, FC, RdC
Calandrinia corrigioloides		K	K	FC, RdC
Callitris rhomboidea		U	U	KH, CB, FC, RdC
Calytrix smeatoniana	R	R	R	KH, CB, FC, RdC
Cardamine paucijuga		R	V	FC, RdC
Carex appressa		K	R	FC, RdC
Carex breviculmis		K	K	FC, RdC
Carex fascicularis		U	R	FC, RdC
Centipeda cunninghamii		K	R	KH, CB, FC, RdC
Centipeda minima		K	R	KH, CB, FC, RdC
Centella cordifolia s.str.		U	R	KH, CB, FC, RdC
Cheiranthera volubilis	V	V	V	KH, CB, FC, RdC

APPENDIX II

Choretrum spicatum	R	R	R	KH, CB, FC, RdC
TAXON	**AUS**	**SA**	**KI**	**RESERVES**
Chorizandra enodis		K	U	KH, CB, FC, RdC
Correa aemula s.str.		R	R	KH, CB, FC, RdC
Correa decumbens		U	U	KH, CB, FC, RdC
Corybas despectans		U	U	KH, CB
Crassula helmsii		K	K	KH, CB
Cryptandra hispidula		U	U	KH, CB, FC, RdC
Cryptandra waterhousii	R	U	U	KH, CB, FC, RdC
Cryptostylis subulata		V	E	FC, RdC
Cyperus tenellus		K	U	KH, CB, FC, RdC
Dampiera lanceolata var. *insularis*		U	U	FC, RdC
Danthonia geniculata		K	U	FC, RdC
Danthonia racemosa var. *racemosa*		K	R	FC, RdC
Daviesia leptophylla		K	R	FC, RdC
Derwentia derwentiana ssp *anisodonta*	K	R	R	KH, CB
Deyeuxia minor		K	K	FC, RdC
Deyeuxia quadriseta		K	K	FC, RdC
Dichelachne crinita		K	K	FC, RdC
Diuris brevifolia	R	R	R	KH, CB, FC, RdC
Drosera binata		R	R	FC, RdC
Drosera praefolia		R	R	KH, CB, FC, RdC
Echinopogon ovatus var *ovatus*		R	R	FC, RdC
Eleocharis sphacelata		R	R	FC, RdC
Empodisma minus		U	R	FC, RdC
Epilobium billardierianum ssp *cinereum*		K	E	FC, RdC
Eriochilus cucullatus		K	U	FC, RdC
Eryngium vesiculosum		R	R	KH, CB, FC, RdC
Eucalyptus leucoxylon ssp *leucoxylon*		K	U	KH, CB, FC, RdC
Eucalyptus oleosa		K	R	FC, RdC
Eucalyptus ovata		U	R	KH, CB, FC, RdC
Eucalyptus paludicola	V	V	V	KH, CB
Eucalyptus remota		U	U	FC, RdC
Eucalyptus viminalis ssp *cygnetensis*		K	R	FC, RdC
Exocarpos aphyllus		K	R	KH, CB
Exocarpos cupressiformis		K	U	FC, RdC
Gahnia hystrix	R	R	R	FC, RdC
Gahnia sieberiana		U	R	FC, RdC
Gastrodia sesamoides		R	K	FC, RdC
Gleichenia microphylla		R	R	FC, RdC
Glossostigma diandrum			R	FC, RdC
Gonocarpus micranthus ssp *micranthus*		R	R	FC, RdC
Goodenia amplexans		U	U	FC, RdC
Gratiola peruviana		K	U	FC, RdC
Grevillea linearifolia		U	U	FC, RdC
Grevillea pauciflora ssp *pauciflora*		U	U	KH, CB, FC, RdC
Grevillea quinquenervis		U	U	KH, CB, FC, RdC
Grevillea rogersii	R	R	R	FC, RdC
Gyrostemon thesioides		U	U	KH, CB, FC, RdC
Hakea aenigma	R	R	R	FC, RdC
Haloragis brownii		R	R	FC, RdC

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Haloragis eichleri	R	R	R	FC, RdC
TAXON	**AUS**	**SA**	**KI**	**RESERVES**
Helichrysum adenophorum var *adenophorum*		U	U	KH, CB, FC, RdC
Hibbertia acicularis		R	R	KH, CB, FC, RdC
Hibbertia paeninsularis	R	U	U	FC, RdC
Hydrocotyle comocarpa	R	R	K	FC, RdC
Hydrocotyle crassiuscula	K	R	R	FC, RdC
Hydrocotyle hirta		R	R	FC, RdC
Hydrocotyle muscosa		K	R	FC, RdC
Hypericum gramineum		K	R	FC, RdC
Hypericum japonicum		K	K	FC, RdC
Hypolepis rugosula		R	R	FC, RdC
Irenepharsus phasmatodes	R	R	R	FC, RdC
Isoetes drummondii ssp *drummondii*		R	R	FC, RdC
Isolepis cernua		K	U	KH, CB, FC, RdC
Isolepis fluitans		U	U	KH, CB, FC, RdC
Isolepis inundata		K	R	KH, CB, FC, RdC
Isolepis platycarpa		K	U	FC, RdC
Isolepis producta		R	R	KH, CB, FC, RdC
Isolepis stellata		R	R	KH, CB, FC, RdC
Juncus caespiticius		K	R	FC, RdC
Juncus planifolius		K	R	FC, RdC
Lagenifera huegelii		K	R	KH, CB
Lavatera plebeia		K	U	FC, RdC
Lawrencia spicata		U	U	FC, RdC
Lawrencia squamata		K	K	FC, RdC
Lepidium desvauxii		R	R	FC, RdC
Lepidium foliosum			K	FC, RdC
Lepidosperma longitudinale		K	R	FC, RdC
Lepidosperma semiteres		K	U	FC, RdC
Leptocarpus tenax		K	U	FC, RdC
Leptoceras menziesii		K	R	FC, RdC
Leptomeria aphylla		U	U	KH, CB, FC, RdC
Leptorhynchos squamatus		K	R	FC, RdC
Leptorhynchos waitzia		K	R	FC, RdC
Lepyrodia valliculae	R	R	R	FC, RdC
Leucopogon clelandii		K	R	FC, RdC
Leucopogon hirsutus		R	R	FC, RdC
Leucopogon lanceolatus		U	R	KH, CB, FC, RdC
Leucopogon rufus		U	U	KH, CB, FC, RdC
Leucopogon virgatus		K	R	KH, CB, FC, RdC
Leucopogon woodsii		K	U	KH, CB, FC, RdC
Levenhookia dubia		K	R	FC, RdC
Lilaeopsis polyantha		Q	R	FC, RdC
Limosella australis		K	U	KH, CB, FC, RdC
Lindsaea linearis		U	R	KH, CB, FC, RdC
Lobelia rhombifolia		U	U	KH, CB, FC, RdC
*Logania "*Gosse*"*	R	R	R	FC, RdC
Logania insularis	V	V	V	FC, RdC
Lomandra juncea		K	R	FC, RdC
Luzula densiflora		U	R	FC, RdC

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Luzula meridionalis		K	R	FC, RdC
TAXON	**AUS**	**SA**	**KI**	**RESERVES**
Lycopodiella lateralis		R	R	FC, RdC
Melaleuca squamea		R	R	FC, RdC
Microcybe pauciflora		K	U	KH, CB, FC, RdC
Microlaena stipoides var *stipoides*		K	R	FC, RdC
Microlepidium pilosulum	K	R	R	FC, RdC
Microtis atrata		R	R	FC, RdC
Microtis orbicularis		R	R	KH, CB, FC, RdC
Millotia myosotidifolia		K	R	FC, RdC
Mimulus repens		K	R	KH, CB, FC, RdC
Mitrasacme distylis		R	R	FC, RdC
Montia australasica		R	K	FC, RdC
Myoporum brevipes		K	R	FC, RdC
Myriophyllum amphibium		R	K	FC, RdC
Myriophyllum muelleri		K	U	KH, CB, FC, RdC
Myriophyllum salsugineum		K	K	KH, CB, FC, RdC
Nymphoides geminata		V	V	FC, RdC
Olax obcordata		R	V	FC, RdC
Olearia teretifolia		U	U	KH, CB, FC, RdC
Opercularia ovata		U	R	FC, RdC
Opercularia turpis		K	K	FC, RdC
Orthoceras strictum		U	R	KH, CB
Ottelia ovalifolia		R	K	FC, RdC
Patersonia fragilis		U	U	KH, CB, FC, RdC
Persicaria prostrata		U	R	FC, RdC
Phylloglossum drummondii		R	V	FC, RdC
Pimelea macrostegia		U	U	KH, CB, FC, RdC
Platysace heterophylla var *tepperi*	R	R	R	FC, RdC
Poa fax		R	R	KH, CB, FC, RdC
Poa tenera		U	R	FC, RdC
Podolepis jaceoides		R	R	FC, RdC
Podolepis rugata var *littoralis*		U	U	FC, RdC
Pomaderris halmaturina ssp *halmaturina*	V	V	E	FC, RdC
Potamogeton ochreatus		R	R	KH, CB, FC, RdC
Potamogeton tepperi		K	K	FC, RdC
Prasophyllum australe		R	R	FC, RdC
Prasophyllum elatum		K	U	FC, RdC
Prostanthera serpyllifolia ssp *microphylla* (purplish-green flowers)		K	K	FC, RdC
Prostanthera serpyllifolia ssp *microphylla* (red flowers)		R	R	KH, CB, FC, RdC
Prostanthera serpyllifolia ssp *microphylla*		K	R	KH, CB, FC, RdC
Pseudanthus micranthus	R	R	R	FC, RdC
Pterostylis alata		U	U	KH, CB
Pterostylis erythroconcha		K	U	FC, RdC
Pterostylis furcata		E	E	FC, RdC
Pterostylis nutans		K	R	FC, RdC
Ptilotus beckerianus	V	V	V	KH, CB, FC, RdC
Pultenaea canaliculata var		U	U	KH, CB
Pultenaea daphnoides		K	U	KH, CB, FC, RdC

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Pultenaea laxiflora		K	R	FC, RdC
TAXON	**AUS**	**SA**	**KI**	**RESERVES**
Pultenaea scabra		R	R	FC, RdC
Pultenaea densifolia		U	U	FC, RdC
Pultenaea trifida	R	U	U	FC, RdC
Pultenaea trinervis	K	K	R	FC, RdC
Pultenaea villifera var *glabrescens*	V	V	V	FC, RdC
Ranunculus amphitrichus		U	R	KH, CB, FC, RdC
Ranunculus pumilio var *pumilio*		K	K	FC, RdC
Restio complanatus		V	V	FC, RdC
Scaevola albida			R	FC, RdC
Schizaea fistulosa		V	V	FC, RdC
Schoenoplectus validus		K	R	KH, CB
Schoenus carsei		U	K	FC, RdC
Schoenus discifer	R	R	R	KH, CB, FC, RdC
Schoenus fluitans		U	R	KH, CB, FC, RdC
Schoenus maschalinus		U	R	FC, RdC
Schoenus nitens		K	R	KH, CB, FC, RdC
Schoenus sculptus		R	R	KH, CB
Schoenus tesquorum		R	K	FC, RdC
Scutellaria humilis		R	R	FC, RdC
Selaginella gracillima		U	V	FC, RdC
Selliera radicans		K	R	FC, RdC
Senecio glomeratus		K	K	FC, RdC
Senecio hispidulus var *hispidulus*		U	K	FC, RdC
Senecio magnificus		K	E	FC, RdC
Senecio minimus var *minimus*		R	K	KH, CB
Senecio odoratus var *longifolius*		R	R	FC, RdC
Spiranthes sinensis ssp *australis*		R	E	FC, RdC
Sprengelia incarnata		R	R	FC, RdC
Spyridium bifidum var *integrifolium*	K	K	K	FC, RdC
Spyridium halmaturinum var *integrifolium*		U	U	FC, RdC
Spyridium nitidum		U	U	FC, RdC
Stackhousia spathulata		K	U	FC, RdC
Stipa macalpinei		U	U	FC, RdC
Stylidium beaugleholei		R	R	KH, CB, FC, RdC
Stylidium calcaratum		K	U	KH, CB, FC, RdC
Stylidium graminifolium		K	U	FC, RdC
Stylidium inundatum		K	U	FC, RdC
Stylidium perpusillum		R	R	KH, CB, FC, RdC
Stylidium tepperianum	R	R	R	KH, CB, FC, RdC
Thelymitra benthamiana		U	U	FC, RdC
Thelymitra canaliculata		U	R	KH, CB, FC, RdC
Thelymitra flexuosa		R	R	KH, CB, FC, RdC
Thelymitra matthewsii	V	E	E	FC, RdC
Thelymitra mucida		R	R	FC, RdC
Todea barbara		E	E	FC, RdC
Tricoryne tenella		K	R	FC, RdC
Triglochin striatum		K	U	FC, RdC
Urtica incisa		U	R	KH, CB, FC, RdC
Utricularia dichotoma		U	R	KH, CB, FC, RdC

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Utricularia tenella		U	R	FC, RdC
TAXON	**AUS**	**SA**	**KI**	**RESERVES**
Villarsia reniformis		K	R	FC, RdC
Utricularia lateriflora		V	V	FC, RdC
Villarsia umbricola var *umbricola*		U	R	FC, RdC
Viminaria juncea		R	R	FC, RdC
Wilsonia rotundifolia		K	R	FC, RdC
Wurmbea dioica ssp *dioica*		K	R	FC, RdC
Wurmbea latifolia ssp *vanessae*	Q	R	R	FC, RdC
Xanthosia tasmanica		R	V	FC, RdC
Xyris operculata		R	R	FC, RdC
Zieria veronicea		R	R	KH, CB, FC, RdC
Zoysia matrella		R	R	FC, RdC

X **Extinct**/Presumed extinct: not located despite thorough searching of all known and likely habitats; known to have been eliminated by the loss of localised population(s); or not recorded for more than 50 years from an area where substantial habitat modification has occurred.

E **Endangered**: rare and in danger of becoming extinct in the wild.

T **Threatened**: likely to be either endangered or vulnerable but insufficient data for a more precise assessment.

V **Vulnerable**: rare and certainly at risk from potential threats or long term threats which could cause the species to become endangered in the future.

K **Uncertain**: likely to be either threatened or rare but insufficient data for a more precise assessment.

R **Rare**: has a low overall frequency of occurrence (may be locally common with a very restricted distribution or may be scattered sparsely over a wider area). Not currently exposed to significant threats, but warrants monitoring and protective measures to prevent reduction of population sizes.

U **Uncommon**: less common species of interest, but not rare enough to warrant special protective measures.

Q Not yet assessed, but flagged as being of possible conservation significance.

FC Flinders Chase National Park

KH Kelly Hill Conservation Park

CB Cape Bouguer Wilderness Protection Area

RdC Ravine des Casoars Wilderness Protection Area