

Department for Environment and Heritage
Management Plan



Vulkathunha-Gammon Ranges
National Park
2006



Government
of South Australia

This plan of management was adopted on 24 August 2006 and was prepared pursuant to section 38 of the *National Parks and Wildlife Act 1972*.



Government of South Australia

Department for Environment
and Heritage

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Prepared by the Minister for Environment and Conservation in collaboration with the Adnyamathanha people.

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FOREWORD

The Vulkathunha-Gammon Ranges National Park incorporates 128,228 hectares of the visually spectacular Northern Flinders Ranges. The park is part of the traditional country of the Adnyamathanha people for whom it is of special cultural significance. It contains a wide range of important cultural features and evidence of their past occupation. In 2003 the park was co-named to include 'Vulkathunha' in its title, in recognition of this Adnyamathanha tradition.

The extensive arid ecosystems in the park incorporate a variety of habitats that have developed on sites ranging from steep, rocky mountain areas to broad, open plains. These habitats types support a number of native species of conservation significance, both plants and animals. The park is also popular with bushwalkers and with those who enjoy outdoor recreation in South Australia's distinctive 'Outback' environment.

In 2005, the State of South Australia and the Adnyamathanha people entered into an Indigenous Landuse Agreement (ILUA) over the land comprising the park. They also entered into a Co-management Agreement (CMA) that provides for the use of the park by the Adnyamathanha people in such a way that their cultural, economic, social and environmental aspirations can be enhanced in a manner consistent with the management objectives for the park. As of December 2005, the management of the park became the responsibility of the Vulkathunha-Gammon Ranges National Park Co-management Board, a body that includes representatives from both the Adnyamathanha and the Department for Environment and Heritage.

The management plan was prepared in collaboration with the Adnyamathanha people and sets out a series of objectives and strategies for the future management and use of this significant reserve. A number of parks in South Australia are subject to co-operative management arrangements or agreements with Aboriginal traditional owners. The co-management of the park will help to ensure that the quality of the environment is enhanced and its cultural significance to Aboriginal people is recognised and protected. The plan will facilitate the continuous development and implementation of high quality conservation programs and visitor facility improvements.

Many people have contributed to the development of this plan of management, in particular the Adnyamathanha representatives who served on the Vulkathunha-Gammon Ranges National Park Co-operative Management Committee that preceded the Board. Other people took the time to make written submissions on the plan when it was released in draft form for public exhibition. Their interest and helpful suggestions are gratefully acknowledged.

I now formally adopt the plan of management for Vulkathunha-Gammon Ranges National Park under the provisions of section 38 of the *National Parks and Wildlife Act 1972*. I encourage you to read the plan and visit and enjoy this exceptional park.



HON GAIL GAGO MLC

MINISTER FOR ENVIRONMENT AND CONSERVATION



A SHARED VISION

When the first European settlers arrived in southern Australia, the Australian continent was already occupied by Aboriginal societies, each with their own territories and characteristics. Research indicates that Aboriginal people have been in Australia for more than 40,000 years.

During this time, those Indigenous societies had developed sophisticated techniques for the use and management of the products of the land. Further, they had codified in their traditions a detailed understanding of the relationships between their surrounding environments and the unique plants and animals that had evolved in this, the world's most isolated continent.

Today, national parks and other protected areas have been set aside in an attempt to ensure application of land management techniques that achieve a desirable balance between human aspiration and effort and the needs of native species. In the past, management of such protected areas, while well intentioned, was largely oblivious to the benefits that were available through application of Aboriginal knowledge.

The Adnyamathanha people, the traditional owners of the Vulkathunha-Gammon Ranges National Park, have expressed a desire to join in partnership with the Department for Environment and Heritage in the ongoing operation and management of their traditional lands as a national park. Such a partnership, through the Co-management agreement for the park, will link their skills and knowledge with those of the professional park managers. It will achieve the most desirable and effective conservation outcomes and ensure that the park remains accessible to visitors.

This plan takes up the challenge of managing a cultural landscape, still known and understood by its Aboriginal traditional owners, in a manner that ensures the protection of its environment. It engages the Aboriginal traditional owners directly in the process as co-managers, to incorporate new insights into management techniques and ensure that the park evolves to meet world-class standards in park management.

The Vulkathunha-Gammon Ranges National Park Co-management Board is responsible for managing the park and implementing this plan of management. Throughout the plan, reference to the 'park managers' implies the Board, whose function and accountability is to give effect to the objectives and strategies set out in this plan.

SYNOPSIS

The first section of the Vulkathunha-Gammon Ranges National Park, located in the rugged, Northern Flinders Ranges of South Australia was proclaimed in 1970. The now expanded park is located approximately 700km north of Adelaide and 100km east of the township of Leigh Creek. It covers an area of 128,228 ha. The park environment, with a varying terrain of deep gorges, rocky plains, steep mountains and stony riverbeds, resembles the rest of the Flinders Ranges, but is much more isolated and arid. For many people, this spectacular, signature landscape offers the quintessential 'outback' experience.

The human history of the Gammon Ranges goes back long before the European settlement of Australia. The Adnyamathanha people of the region believe they have always lived here and to this day persons of Adnyamathanha descent retain strong links with their traditional lands. Rock carvings and paintings are a more obvious part of that cultural and spiritual legacy and in recognition of those ties, the traditional Aboriginal name *Vulkathunha* was officially assigned to the park in May 2003. This Adnyamathanha word literally means 'old lady' and reflects a significant Adnyamathanha story connected with this country. The more recent history of Gammons Ranges has included mining, smelting, and sheep grazing.

Because of their long association with the land, the cultural and spiritual values of the park are particularly significant for the Adnyamathanha. They have maintained this association through the changing times of colonial settlement, pastoral occupation and park management. The first discussion of Adnyamathanha participation in the park's management began in the 1960s when National Parks officers sought support from the people at Nepabunna for the dedication of the park. The matter was also discussed with the then Minister, Hon David Wotton, at the dedication ceremony of the 'Range Country' addition to the park in 1982.

In the 1990s the Adnyamathanha lodged claims for recognition of native title over land that includes the park. Protracted negotiations followed and a cooperative management committee, that included representatives of the traditional owners, was established in 2004. Amongst other things, the committee worked on preparing a management plan for the park. In 2005 an Indigenous Land Use Agreement (ILUA) and a Co-management Agreement (CMA) were signed and the Vulkathunha-Gammon Ranges National Park Co-management Board (hereafter referred to as the Board') was established.

The park was originally proclaimed to protect scenic and 'wilderness' values (especially for remote area bushwalking). Although environmentally modified, the park retains some unique, arid-zone biodiversity values and distinctive characteristics that make it an ecologically significant area. Since the mid-1990s, as part of an ecological recovery program, substantial efforts have been made in feral animal control and in 2002 mining access was totally prohibited.

The park caters for persons seeking an authentic, arid land 'outback' environment and in recent years, visitor numbers have averaged around 17,000 per annum, most visiting from autumn to spring and avoiding the hot, dry summers. The most common on-park activities and uses involve landscape and nature appreciation, touring by vehicle, and bushwalking. Visitors with 4WDs can traverse a range of tracks, camp out and enjoy the scenery. Some cabin-style accommodation is available for rental and is well patronised. Most of the park still remains accessible only by foot, attracting self-sufficient bushwalkers who want a physically demanding, but highly rewarding experience.

This management plan was prepared in collaboration with representatives of the Adnyamathanha people who have traditional ties with the Gammon Ranges area and the Board has agreed that it should be adopted. It acknowledges an overarching spiritual and cultural basis for management, and includes proposals that will protect 'Yarta' or 'country' and its values, while still allowing for sustainable and appropriate public use and enjoyment.

Achieving mutual respect and understanding and an effective working relationship between the co-management partners, as well as mechanisms for achieving future aspirations, are pre-requisites for success. The major management goals are the protection of cultural values and biodiversity, together with the progressive restoration of the park environment. Traditional Adnyamathanha knowledge will be incorporated into management strategies and interpretive material. Low impact public recreation will continue to be encouraged.

The high priority strategies to be progressed over the term of this plan will focus on completion of the upgrading of the Balcanoona Park Headquarters precinct as a centre for visitors. Projects supporting ecological restoration and threat abatement will continue, the intention being to integrate on-park management activities with related regional initiatives.

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Special thanks and recognition must go to the Adnyamathanha members of the Vulkathunha-Gammon Ranges National Park Cooperative Management Committee who participated in the development of the plan, namely: Gilbert Coulthard (ATLA sub-committee), Arnold Wilton (ATLA sub-committee), Janet Coulthard (ATLA sub-committee), Deidre Coulthard (ATLA sub-committee), Kristian Coulthard (ATLA sub-committee/DEH), Judy Johnson (ATLA sub-committee). Graham Harbord (ATLA Legal Representative) and Bob Ellis (ATLA Anthropologist) assisted the Committee members.

DEFINITIONS

Biodiversity: Biological diversity is the variety of all life forms - the different plants, animals and microorganisms, the genes they contain, and the ecosystems of which they form a part. It is not static, but constantly changing; it is increased by genetic change and evolutionary processes and reduced by processes such as habitat degradation, population decline, and extinction. The concept emphasises, the interrelatedness of the biological world. It covers the terrestrial, marine and other aquatic environments.

Biological diversity is usually considered at three levels:

- **genetic diversity** - the variety of genetic information contained in all of the individual plants, animals and microorganisms that inhabit the earth. Genetic diversity occurs within and between the populations of organisms that comprise individual species as well as among species;
- **species diversity** - the variety of species on the earth; and
- **ecosystem diversity** - the variety of habitats, biotic communities and ecological processes.

1 PARK LOCATION AND FEATURES

The Vulkathunha-Gammon Ranges National Park is located in the Northern Flinders Ranges of South Australia, approximately 700km north of Adelaide (Figure 1). It has an area of 128,228 ha and lies 100km east of the township of Leigh Creek, encompassing the Gammon Ranges, Mount McTaggart, Hawker Hill and follows Balcanoona Creek across the plains, east to Lake Frome.

The first portion of the Vulkathunha-Gammon Ranges National Park was proclaimed in 1970 under the then *National Parks Act 1966* as the 'Gammon Wilderness National Park', and on enactment of the *National Parks and Wildlife Act 1972* became known as the Gammon Ranges National Park. Substantial land additions (part of the former Balcanoona Pastoral Lease) were made in 1982, prior to which discussions over the future management of the area were held between the Department and Adnyamathanha people resident at the nearby Nepabunna community.

In 2003, the name of the park was altered to the Vulkathunha-Gammon Ranges National Park to reflect the strong cultural and spiritual associations that the Adnyamathanha people have with this country.

The park conserves some of the most rugged landscape of the Northern Flinders Ranges where the alternating soft and hard sedimentary rocks of the region have been folded and faulted and then deeply eroded and incised by the action of running water. The resultant signature landscape has a special, spectacular beauty; chasms, gorges, bluffs and plateaus complement the ridgebacks, rolling hills and out-wash plain of the Balcanoona Creek.

The park lies within an area of great significance to the Adnyamathanha people. *Adnyamathanha* is a collective term that refers to the Aboriginal people who claim traditional association with the Northern Flinders Ranges and which may be etymologically analysed as 'stone (ie. ranges) people'. *Muda* stories and song-lines cross the area and numerous sites of cultural significance occur within the park. Many of the animals and plant species that were originally found in the park, including the Bilby, Rock-wallaby, Stick-nest Rat and Carpet Python are of special personal significance to Adnyamathanha for whom they were *mukunha*.

This was a form of totem (inherited from the mother) that conferred on an individual a special relationship with areas of land and involved special responsibilities for the maintenance of the affiliated species. Despite their dispossession and hardships since colonial occupation, the Adnyamathanha have maintained ties, derived from their *mukunha* affiliation, with their *Yarta* or 'country' and they continue to be involved in park management today. In addition to the Aboriginal cultural story, the park includes historic relics from pastoral and mining activities dating back to the mid-nineteenth century.

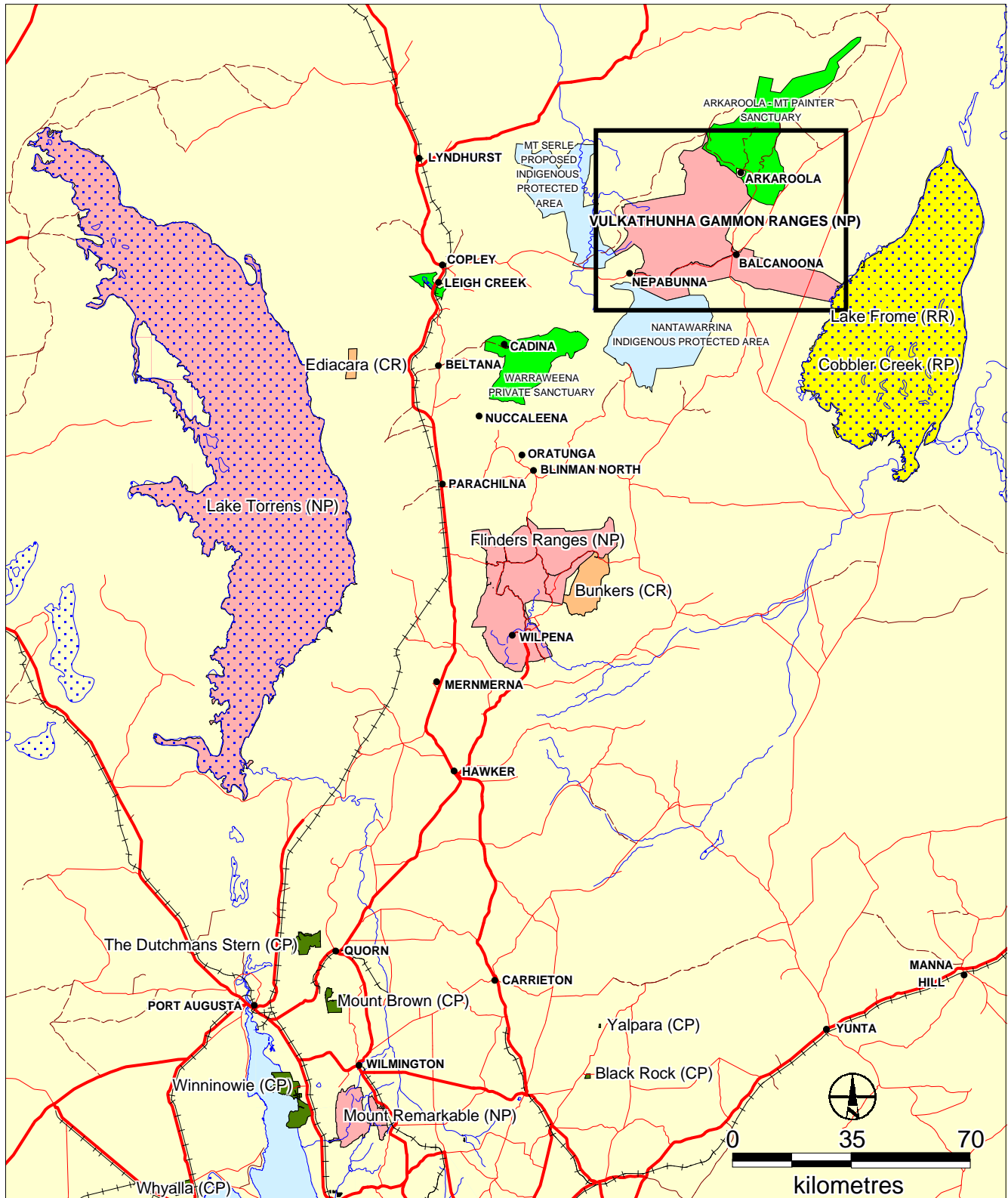
Visitors to the park today are still confronted by a mountainous, arid-zone 'wilderness' landscape (ie an area where there are few obvious signs of modern, technological development). The park has interesting heritage sites and remnant flora and fauna and the opportunities it provides for people to interact with a rugged and dramatic landscape, either by vehicle or on foot, are very compelling. However, it is worth noting for those unaware of the previous environmental amenity, that the Australian landscape had been culturally significant for more than 40,000 years prior to colonisation and continues to be so.

Under the Interim Biogeographic Regionalisation of Australia (IBRA), the park makes a significant contribution to the conservation of ecosystems in the Flinders Lofty Block and Stony Plains IBRA regions.

With the exception of the most elevated peaks, the climate of the Northern Flinders Ranges is predominantly continental and arid. In this region, the majority of the rainfall occurs in the warmer months. The sources of precipitation are mainly late spring and summer thunderstorms and those more infrequent, but extended periods, when tropical cyclones become rain depressions and push further south than usual. Because of the unpredictable timing and pattern of rainfall, drought conditions are common in the Gammon Ranges region.

The Vulkathunha-Gammon Ranges National Park is one of a number of large reserves in the Far North of South Australia including: Flinders Ranges National Park to the south; Lake Frome Regional Reserve adjoining to the east; and Ediacara Conservation Reserve and Lake Torrens National Park located to the west.

The major land uses in the region surrounding the park are pastoral grazing, mining, tourism and outdoor recreation. The Arkaroola-Mount Painter lease, which adjoins the park on the north-east, is a Sanctuary declared under the *National Parks and Wildlife Act 1972* and managed primarily for tourism. Warraweena is another pastoral lease that is managed as a private conservation area.



Protected Areas

- Conservation Park
- Conservation Reserve
- National Park
- Regional Reserve
- Sanctuary
- Indigenous Protected Area

Road and Rail

-
-
-
-
-

Drainage

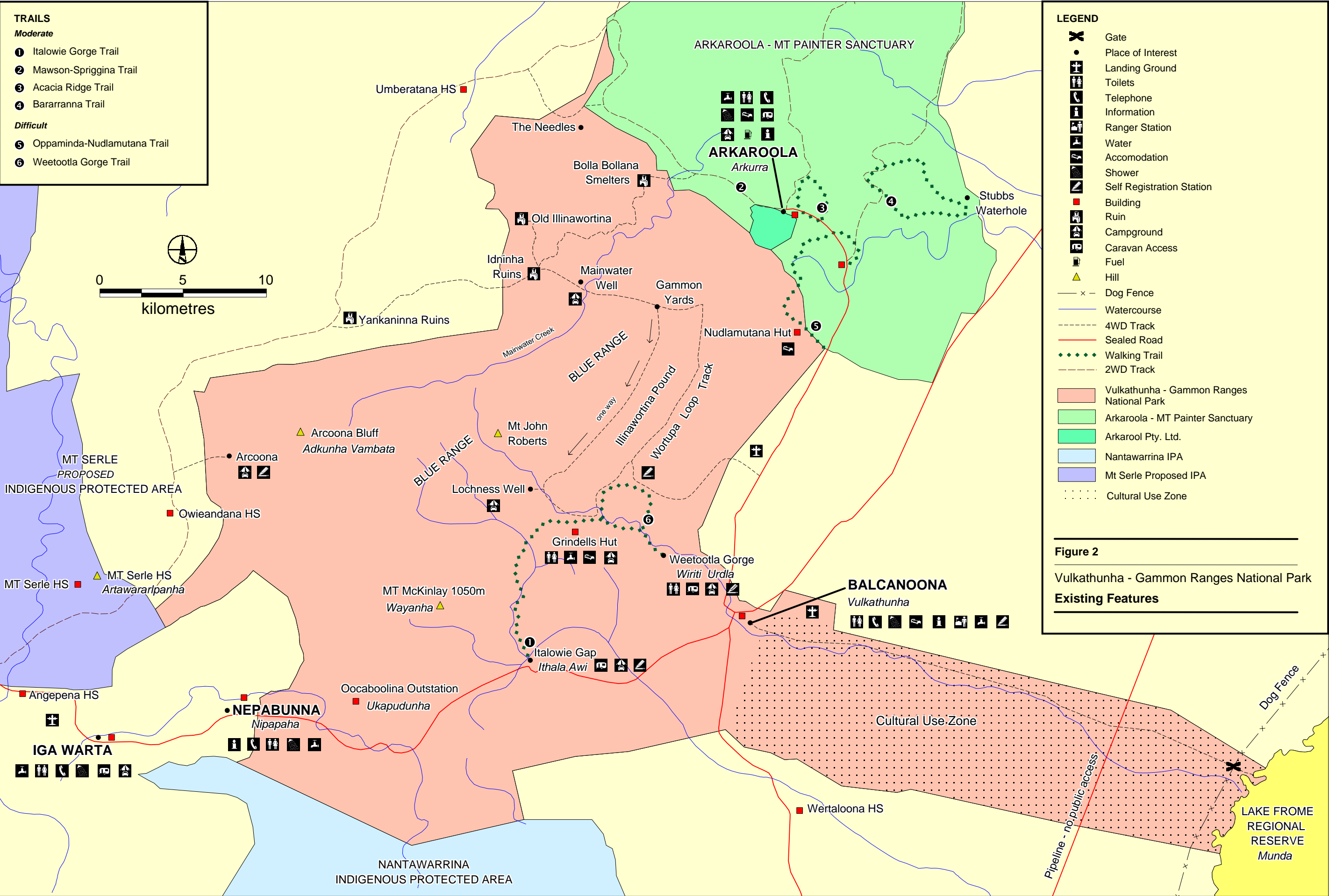
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Figure 1

Vulkathunha - Gammon Ranges National Park

Location

Map created using PAMS
Projection: MGA Zone 54 (GDA 94)
Date: 2005



There are substantial areas of land that border or are located very close to the park that are currently managed and controlled by Adnyamathanha people. Nepabunna Community borders the park on the southern boundary. It is an area of freehold land that, under the *Aboriginal Lands Trust Act (SA) 1966* has been leased to Nepabunna Community Inc. on a 99-year lease. Nepabunna comprises a small township whose residents are Adnyamathanha people.

Nantawarrina was a pastoral lease to the south of the park. The pastoral lease was surrendered and the land was then granted in fee simple to the Aboriginal Lands Trust. Again, the Aboriginal Lands Trust granted a 99-year lease to Nepabunna Community Inc over this land, and it is managed as an Indigenous Protected Area.

Mount Serle is a pastoral lease to the west of Nepabunna. The lease is held by an Adnyamathanha organisation and Adnyamathanha people reside on and work the property. This property too, has been recently nominated as an Indigenous Protected Area.

These particular properties are contiguous with the park and add significantly to the area of land in the region that is managed with a biodiversity conservation agenda. They contribute by providing additional habitat or serve as stepping stones or links that can facilitate movement of species, thus improving overall genetic diversity and boosting ecological sustainability. In fact, there is an almost continuous tract of country, stretching from Arkaroola to Mount Serle, where property managers are committed to conservation outcomes (Figure 1).

The park is located outside of Council areas, in the Far North Planning Region of the state. In the context of regional planning and the requirements of the *Development Act 1993*, the *Development Plan for Land Not Within a Council Area (Flinders)* (November 2001) includes most of Park (ie the 'Range Country') in the Environmental Class A Zone.

The planning objectives for this zone are the conservation of the natural character and environment; the protection of the landscape from damage by mining operations and exploration for new resources; and ensuring that roads do not unduly disturb the natural character and beauty of the area. In order to achieve these objectives, the Development Plan states that no more significant development should occur here. In particular, mining and additional roads are not appropriate in this zone and only (relatively) minor works should be undertaken with minimal environmental impact.

The remainder of the park (ie the 'Plains Block') lies within the Pastoral Landscape Zone. Here too, the zoning objectives are to conserve the natural character and environment; to protect the landscape from damage by mining operations and exploration for new resources; and to ensure roads do not unduly disturb the natural character and beauty of the area. In order to achieve these objectives, development should not impair the natural or scenic features of the zone.

Park managers should heed these zoning provisions when planning for, or undertaking any building work or other developments on the park, and be aware of them when commenting on development proposals in the surrounding area. It should be noted that once this management plan is formally adopted, any (state agency) developments described in this plan will have met the requirements of the *Development Act 1993* and will require no further development approval except for places entered on the State Heritage Register.

1.1 History of Reserve Management¹

Public interest in establishing a national park in the Northern Flinders Ranges began in the 1940s when Professor Sir Kerr Grant suggested to Mr C W Bonython, a committed conservationist and avid bushwalker, that 'this wonderful country ought to be a national park'. Not long after that, Bonython relayed this sentiment in a radio broadcast and proceeded to personally promote the 'wilderness' and scenic values of the Gammon Ranges.

The Adelaide Bushwalkers had started trekking in the Northern Flinders Ranges in 1947 and it was largely from within this group that support for the national park concept grew. For a while, the (relatively) few people interested in trekking in the remote Gammon Ranges arranged access with the pastoral lessee. However, in 1964 an application for a mining exploration licence in the Gammon Ranges spurred Bonython to convince the Flora and Fauna Advisory Committee, of which he was a member, to lobby the government of the day to create a 'wilderness reserve'.

Four years later, the National Parks Commission took control of a portion of the Yankaninna Pastoral Lease, an area that included Mainwater Pound, Arcoona Bluff, and Gammon Hill. The first portion of the Vulkathunha-Gammon Ranges National Park was proclaimed in 1970 under the then *National Parks Act 1966* with an initial area of 15,500 ha. The reserve was given the title 'Gammon Wilderness National Park', in recognition of its rugged character and remoteness from major population centres.

At the time, the reason given for dedicating the park was to conserve some of the following values with the intention of making them available, where appropriate, to the visiting public:

- undeveloped 'wilderness' character and spectacular scenery;
- significant examples of ancient Aboriginal rock art, sites of Aboriginal significance and Aboriginal occupation sites;
- geological features, including fossils, structures, stratigraphy and mineralogy;
- an arid-zone water catchment and drainage system, with elevations varying from below sea level (near Lake Frome) up to 1,000m (the peaks of the Flinders Ranges);
- physical and climatic conditions supporting relict species and communities;
- botanical features, including regional endemic species such as Curly Mallee (*Eucalyptus gillii*), biogeographically relict species such as Broombush (*Melaleuca uncinata*), and threatened species such as Spidery Wattle (*Acacia araneosa*);
- populations of the threatened Yellow-footed Rock-wallaby (*Petrogale xanthopus*) and its habitat;
- some examples of the history of early colonial occupation and settlement; and
- an ability to meet community demands for a park offering a 'remote' experience, while located relatively close to major highways.

In those early days, staff based in Leigh Creek ran the park. Feral goats were abundant and exclosures soon demonstrated the serious impact they were having on the environment. Consequently most initial on-park activity was directed towards assessing the impact of and managing these pest animals.

A decade later in 1980, action by the Nature Conservation Society of South Australia and others culminated in the 82,000 ha Balcanoona Pastoral Lease being purchased. The 'Range Country' was added to the park in 1982. At the dedication ceremony, conducted near Balcanoona, the late Elsie Jackson of Nepabunna (an Adnyamathanha elder) opened the park with the then Minister for the Environment, Hon David Wotton MP. There was a clear understanding amongst those present on that day that Adnyamathanha people would have an ongoing role with the management of the park.

¹ More information on this topic can be found in the *Resource Information Document* (1995).

From then on, park staff were based at Balcanoona and three additional accommodation units were constructed there. A training program was undertaken for four Aboriginal rangers from the local community. Although the initial intention had been to sell off the 25,000 ha Balcanoona 'Plains Block', for biodiversity conservation reasons it too was proclaimed as reserve in 1984, bringing the park to its present 128,228 ha area.

For the next two decades, park managers focussed primarily on managing public risk issues, making incremental improvements to visitor facilities and services, and tackling threats to biodiversity. Roads and key visitor localities have been signposted, and camping areas designated at Weetootla, Italowie and Grindell's. Information and interpretation shelters have been installed at a number of localities.

A self-registration system for campers was initiated and traffic counters installed to gain a better estimation of the numbers of visitors. With the help of the Royal Geographic Society, a number of walking trails have been upgraded and trail brochures produced. Access roads have been maintained and upgraded and for public safety reasons, the eastern part of the Idrina to Loch Ness 'loop road' was restricted to one-way traffic to avoid the danger of collisions.

As a component of the regional 'Operation Bounceback' ecological recovery program and working with the managers of some neighbouring properties, significant inroads have been made into feral animal populations since 1992. Although mustering had been used with some success to remove feral goats previously, 'Operation Bounceback' went several steps further. Using aerial marksmen and with on-ground support from the Hunting and Conservation Branch of the Sporting Shooters Association (SSAA), large numbers of feral goats have been destroyed and the goat population remains at a low level in the park today.

In addition, fox numbers have been reduced through a broad scale fox-baiting program that commenced in 2000. The feral predator-baiting program incorporates the whole park and extends to buffer zones on neighbouring properties. Aerial baiting has also been trialed to assess the effectiveness of this method of bait delivery in remote and rugged areas of the Ranges that provide the primary habitat for Yellow-footed Rock-wallabies. Rock-wallaby numbers have increased in a number of areas, but due to the arid nature of the environment and erratic rainfall, recovery is much slower than in more temperate areas and being dependant on good rainfall events, may take many years or even decades to achieve.

Rabbit numbers have been markedly reduced since the outbreak of Rabbit Haemorrhagic Disease (Calicivirus) in 1995 but fluctuate with the seasons. The former Northern Flinders Ranges Soil Conservation Board² and the Pastoral Board have supported DEH in feral animal control work.

In September 2000 there was a controversial proposal to transfer control of some existing mining leases in Weetootla Gorge and re-activate the old magnesite mine there. This culminated in the proclamation of the park being varied to permanently exclude mining on environmental grounds.

Since the Balcanoona addition, Aboriginal people have been employed on the park and consulted with in matters of public access to sites of cultural significance. Steps were also taken to define areas where traditional game animals could be taken, and Indigenous hunting (mainly for Red Kangaroos) has continued on the 'Plains Block'. Horse riding has been permitted on the park (on public roads and along designated tracks) as an occasional component of Aboriginal owned tourism enterprise.

Volunteer effort resulted in the restoration of Grindell's Hut, and other built visitor accommodation has been upgraded. A site redevelopment concept plan was prepared for the Balcanoona Park Headquarters area and some components of this have been completed. The old homestead building has been partially restored, visitor ablution facilities built, roads in the area upgraded, and Correctional Services' Mobile Outdoor Work (MOW) Camp personnel have made some significant improvements. An interpretation plan was initiated to focus on the old shearing shed as a visitor centre, but further work on this project has been delayed. A new hybrid solar-powered generator was installed at Balcanoona.

² The South Australian Arid Lands Natural Resources Management Board has overarching responsibility for operations formerly undertaken by the Northern Flinders Ranges Soil Conservation Board.

2 LEGISLATIVE FRAMEWORK

2.1 National Parks and Wildlife Act 1972

The Vulkathunha-Gammon Ranges National Park is a co-managed reserve under Division 6A of the *National Parks and Wildlife Act 1972*. A co-management board has been established for this park. Control and management of the park is the responsibility of the Board, whose powers and functions are set out in the *National Parks and Wildlife (Vulkathunha-Gammon Ranges National Park) Regulations 2005*.

When managing this co-managed reserve, the Board is required under section 37 of the *National Parks and Wildlife Act 1972* to have regard to, and provide actions that are consistent with the following objectives of management stated in the Act:

- preservation and management of wildlife;
- preservation of historic sites, objects and structures of historic or scientific interest within reserves;
- preservation of features of geographical, natural or scenic interest;
- destruction of dangerous weeds and the eradication or control of noxious weeds and exotic plants;
- control of vermin and exotic animals;
- control and eradication of disease of animals and vegetation;
- prevention and suppression of bush fires and other hazards;
- encouragement of public use and enjoyment of reserves and education in, and a proper understanding and recognition of, their purpose and significance;
- generally, the promotion of the public interest; and
- preservation and protection of Aboriginal sites, features, objects and structures of spiritual or cultural significance within reserves.

And also the object that provides for effective co-management of the park, to:

- a) ensure the continued enjoyment of the park by the relevant Aboriginal group for cultural, spiritual and traditional uses; and
- b) ensure the continued enjoyment of the park by members of the public in a manner consistent with the co-management agreement for the park; and
- c) ensure the preservation and protection of Aboriginal sites, features, objects and structures of spiritual or cultural significance within the park; and
- d) provide protection for the natural resources, wildlife, vegetation and other features of the park.

Section 38 of the Act states that a management plan is required for each reserve. A management plan should set forth proposals in relation to the management and improvement of the reserve and the methods by which it is intended to accomplish the objectives of the Act in relation to that reserve. A standard management planning process is mandated, to ensure that all statutory obligations are met. Help and guidance with plan preparation is sought and obtained from individuals, community groups or relevant advisory committees, although ultimately the decision on whether or not to adopt a management plan remains a ministerial function, that in the case of co-managed parks requires the agreement of the Board. As a co-managed park, preparing the management plan and undertaking the prescribed community consultation process has been undertaken collaboratively between DEH and the Adnyamathanha people through (initially) the Vulkathunha-Gammon Ranges National Park Cooperative Management Committee and the Board (since December 2005).

The draft plan for the Vulkathunha-Gammon Ranges National Park was released for public exhibition in September 2005. At the close of the three-month comment period, nine submissions had been received, referring to issues including the concept of indigenous co-management, use of Adnyamathanha place names, details of tracks and watercourses, recreational caving, culling

of native and feral animals, adjoining landuse, semantics and the meaning of certain technical terms. All comments and concerns were considered by the Board and the plan endorsed, before it was forwarded to the South Australian National Parks and Wildlife Council for review and endorsement before the revised plan was presented to the Minister for adoption.

In accordance with the Act, the provisions of this management plan must be carried out and no actions undertaken unless they are in accordance with this plan. In order to achieve this, each year park managers, taking regional and district priorities into account, draw up work programs to implement some of the actions proposed in management plans. Implementation of these projects is determined by, and subject to, the availability of resources (eg staffing and funding).

2.2 Native Title Act 1993

Native Title describes the rights and interests Aboriginal and Torres Strait Islander People have in land and waters according to their traditional laws and customs. Commonwealth legislation, in the form of the *Native Title Act 1993* was enacted to:

- provide for the recognition and protection of native title;
- establish ways in which future dealings affecting native title may proceed and to set standards for those dealings;
- establish a mechanism for determining claims to native title; and
- provide for, or permit, the validation of past acts, and intermediate period acts, invalidated because of the existence of native title.

As a result of the negotiations with the Adnyamathanha people the native title claim over the park will be withdrawn and the terms of the Indigenous land Use Agreement over the park acknowledges the traditional rights of the Adnyamathanha community over the park. These rights are exercised subject to this Plan, all relevant legislation and those agreements. The park is located within a larger area that is subject to a claim originally lodged in 1994 by the Adnyamathanha People for a determination of native title. The claim over the remaining land remains unresolved (2006).

The signing of the ILUA and CMA and the creation of the co-management board are seen as positive steps towards reconciliation. These initiatives recognise the special value of the Vulkathunha-Gammon Ranges National Park as a culturally significant landscape. With an effective working arrangement in place for Adnyamathanha involvement with the, better park management and opportunities for public education and understanding of the park's values will result. This management plan, in reflecting an Adnyamathanha perspective, acknowledges an overarching spiritual and cultural foundation for protecting the land.

2.3 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* establishes a Commonwealth approval process for assessment of proposed actions that are likely to have a significant impact on matters of national environmental significance.

With regard to the Vulkathunha-Gammon Ranges National Park, at least six nationally listed species are known to occur within the reserve (see Appendix A). As a consequence, in addition to any state approval that may be required, Commonwealth approval is obligatory for any action that has, will have, or is likely to have a significant impact on those nationally threatened species.

Furthermore, in consultation with relevant state authorities, the Commonwealth Minister for the Environment and Heritage may develop and implement recovery plans and threat abatement plans for threatened species and ecological communities listed under the Act. Where applicable, DEH and the Vulkathunha-Gammon Ranges National Park Co Management Board will contribute to and incorporate relevant actions from these plans into park management regimes and operational procedures.

As yet no Commonwealth-endorsed recovery plans have been adopted for any of the nationally listed threatened species that occur on the park. However, a recovery plan is currently in preparation for the Yellow-footed Rock-wallaby (Baker-Gabb 2005). Furthermore, some of the threat abatement programs and other types of recovery-assisting strategies currently being undertaken will help to ensure the long-term survival of these species.

2.4 Natural Resources Management Act 2004

The *Natural Resources Management Act 2004* integrates previously separate legislation managing water, soil conservation and pest plant and animal control. The Act establishes eight regional Natural Resources Management Boards. The South Australian Arid Lands Natural Resources Management Board has overarching responsibility for operations formerly undertaken by the Northern Flinders Ranges Soil Conservation Board, the Arid Areas Catchment Water Management Board and the Animal and Plant Control Commission.

3 CO-MANAGEMENT AGREEMENT

For the Adnyamathanha people of the Northern Flinders Ranges, the spiritual and cultural values of the Vulkathunha-Gammon Ranges National Park are particularly significant. These people have maintained a connection with their land and seek to exercise traditional care and responsibility in the future. The ongoing involvement of the traditional custodians can help to ensure that not only cultural values, but also the biodiversity and landscape values of the park are protected for future generations. For them to do so effectively requires not only recognition of a spiritual and cultural basis for park management, but also the establishment of a suitable mechanism for consultation and cooperative management.

In response, the traditional owners of the Vulkathunha-Gammon Ranges National Park have joined in partnership with DEH in the ongoing operation and management of their traditional lands as a national park. This partnership involves the legal mechanisms of an ILUA and a CMA. Working together, the Adnyamathanha traditional owners and DEH will strive for the long-term protection of the park and achieve the shared vision outlined in the preface to this plan.

In 2004 the *National Parks and Wildlife Act 1972* was amended to provide for the co-management of national parks and conservation parks by DEH and relevant Aboriginal groups. In appropriate cases, a board of management can be established to perform specified management functions.

In 2005 the Governor established the Vulkathunha-Gammon Ranges National Park Co-Management Board, representing the traditional owners/native title claimants and DEH, to ensure that the park is managed in a way that respects contemporary and traditional culture, knowledge and skills. The role and functions of the Board are set out in detail in the CMA, in the *National Parks and Wildlife Act 1972* and in the Regulations established by the Board.

As is the case with other reserves, affording due respect to cultural/spiritual values, meeting best practice standards in biodiversity and heritage conservation, as well as responsible risk management, may require that public use and visitor access be controlled and regulated. The Board will make every attempt to achieve a fair and just balance across conflicting demands, accepting however that decisions taken may not necessarily please everyone. In so doing, the Board will strive to ensure that visitors are made aware of the reasons for, and validity of, any restrictions imposed on where they can go and what they can do.

The Adnyamathanha people are now directly involved in managing their traditional lands. This has benefits in terms of creating employment opportunities and promoting cultural awareness, gaining a better appreciation of Indigenous culture and applying that knowledge to reserve management. Employment of Adnyamathanha persons on the park is currently at 75% of the existing staff complement (2006) and as far as possible, preference in employment opportunities is given to the Adnyamathanha traditional owners.

Objectives

Adnyamathanha and DEH Board members collaborate in developing appropriate policies and management regimes for the park, thereby reflecting their combined sources of knowledge and understanding.

Board members develop and maintain harmonious partnerships and/or productive working relationships with the other Government agencies, statutory bodies, volunteer organisations and individuals who assist with the management of the park.

Strategies

- DEH staff work closely with the Board members to achieve effective and appropriate management of the park and the preservation of Indigenous cultural heritage.
- Integrate traditional land management knowledge with contemporary science by providing employment opportunities to the Adnyamathanha traditional owners.

4 MANAGING CULTURAL HERITAGE

4.1 Indigenous Heritage

The Adnyamathanha people of the Northern Flinders Ranges are the traditional owners of the land comprising Vulkathunha-Gammon Ranges National Park. *Adnyamathanha* means 'rock' or 'hills' people, a term given to them by their neighbours as a consequence of their occupation of a unique landscape of rugged mountains and plateaux surrounded by plains and salt lakes. Generally, members of the society refer to themselves as *yura*, literally 'human beings' but today the term is used to distinguish themselves from *udnyu*, non-Aboriginal people.

Today, the Adnyamathanha include people who can trace descent from a number of local groups that traditionally occupied the ranges and surrounding areas, including the Wailpi, Yadliyawara, Kuyani and Pilartapa. Adnyamathanha society is a long established, complex and mature society that integrates the personal, social and spiritual life of its members with their surrounding environment. Before European settlement on their lands, Adnyamathanha people managed and protected the Ranges environment, such that some plant species may be dependent upon traditional forms of management and food gathering for their continued survival.

European settlement of the Northern Flinders Ranges began in the 1840s. Along with that settlement came new diseases, population relocation and the take-over of land and water supplies. While this sometimes resulted in violent conflict, the Adnyamathanha contributed in a significant way to the success of the pastoral industry with which they are still proudly involved and to other activities, such as mining and tourism. By so doing, they were able to retain a connection with their 'country' of which they were progressively dispossessed. As a consequence of this dispossession, their ability to maintain their traditional lifestyle diminished. Later, a sympathetic pastoralist ceded land in the Angepina area and enabled the Adnyamathanha to establish a small settlement at Nepabunna that was run for many years as a mission.

So while events in the past had a huge impact on the Adnyamathanha and their neighbours, much of the language, complex kinship systems, traditional *muda* histories, ceremonies, significant and sacred sites, hunting and gathering techniques and other important cultural and heritage matters were preserved. In particular, their language, traditional stories and place names continue to be passed on to new generations.

Today, Adnyamathanha people live as neighbours to the park at Nepabunna, Nantawarrina, Mount Serle and other locations throughout the Ranges. For the last three decades Adnyamathanha people have worked to record their significant sites in cooperation with government bodies, most recently with the Department of Aboriginal Affairs and Reconciliation (DAARE). A number of Adnyamathanha people are and have been employed on the park and Adnyamathanha people today manage the Nantawarrina and Mount Serle pastoral properties adjacent to Nepabunna and the park. Their continued involvement in the ongoing management of the park through the ILUA and CMA and the Vulkathunha-Gammon Ranges National Park Co-management Board established in 2005 to facilitate that involvement, are important steps in formalising their traditional ties to the area.

Muda Histories

For Aboriginal people, land and waters have many complex and interconnected meanings and values. The significance of land and waters is central to their lives: at birth, death, in ceremonies and socially, while hunting, harvesting, camping and travelling. Many of the complex cultural practices derive from the *muda*, the traditional histories of their society.

The term *yarta* is generally interpreted as meaning 'country', although it does have a specific application to areas of land associated with matrilineal *mukunha* or 'totems'. Within the traditional country of the Adnyamathanha are places, recorded in the *muda*, that are significant for particular reasons. Some of these places may be dangerous to visitors and prohibited from general access (*munda*), others may be part of gender-specific knowledge, or may only be completely known and understood by men who have been initiated into the esoteric traditions that accompany these places. Such places are often landscape features: trees, sand dunes, waterholes or salt lakes. Knowledge of these places is passed down from generation to generation as part of the oral traditional of the society.

Many places in the park relate to these traditional stories, after which landscape features are named. It is intended to incorporate Adnyamathanha names onto park signs and information material and ensure that where possible, they are used in preference to those applied by occasional visitors and guidebook writers. The park also contains a number of places of special significance and there may be some proscription on visiting these *munda* or dangerous/prohibited places unless accompanied by Adnyamathanha guides. The Vulkathunha-Gammon Ranges National Park Co-management Board will provide guidance on these matters and ensure visitor information material explains the need for any restrictions on public access.

Aboriginal Heritage Act 1988

The purpose of the *Aboriginal Heritage Act 1988* is the protection and preservation of Aboriginal sites, objects and remains. The Department of Aboriginal Affairs and Reconciliation (DAARE) maintains a Central Archive, including the Register of Aboriginal Sites and Objects. Aboriginal site is defined under the Act as "An area of land that is of significance according to Aboriginal tradition; or that is of significance to Aboriginal archaeology, anthropology or history."

There are numerous sites listed on the DAARE Central Archive for the park. Details are held for 16 archaeological sites; 30 mythological sites; seven historic sites; one burial site; five painting sites; and seven engraving sites. However, these records are not comprehensive and to achieve better cultural heritage management, further research needs to be undertaken to identify and appropriately record any additional sites of significance.

The Board must comply with all relevant provisions of the *Aboriginal Heritage Act 1988*, the ILUA and the CMA for the protection of sites. In particular when contemplating and before proceeding with any on-ground activities that involve earthworks, it is essential to follow the protocol set out in the ILUA and CMA, formally notifying ATLA (representing the Adnyamathanha traditional owners) to ensure the protection of cultural heritage sites and to avoid inadvertent damage.

4.2 Non-Indigenous Heritage

The heritage values of the park include facets of early pastoral and mining life and represent a continuum from the pre-colonisation era of exclusive Aboriginal occupation to the present day. It should be noted that the Adnyamathanha people were active participants throughout and undertook much of the construction and subsequent operation of this infrastructure, maintaining their involvement right through to present times. For that reason, use of the term 'non-indigenous' heritage may give a false and misleading impression.

The historic fabric of the post-colonisation era is represented by buildings, mines, smelters, shepherds' huts, water supply infrastructure, plantings, rubbish and mullock heaps. The heritage material is deteriorating as a natural consequence of time and weather. In some places, fossicking and other visitor impacts are accelerating its destruction.

A number of historic structures have been identified within the park as relics of previous landuses and management, particularly the pastoral and mining industries.

Bolla Bollana brick kiln and copper smelter ruins are listed on the State Heritage Register under the *Heritage Act 1993* (#10317). The Statement of Significance reads:

"The Bolla Bollana Smelter complex was built in 1873 by Alfred Frost for the South Australian and Victorian Copper and Bismuth Company. It was intended for treating copper ore from the Stanley and Daly Mines. Located in the Northern Flinders Ranges, the complex represents a story of innovation and persistence in processing the region's rich deposits of copper against the insurmountable obstacles presented by its isolation. The Bolla Bollana complex closed down in 1876, after only three years."

Other sites identified include:

- Balcanoona precinct including old homestead, shearing shed and shearers' quarters, meathouse, machine shop, sheep-yards and stone water tanks;
- Grindell's Hut site with original shepherds' hut, stone residence, and stone water tanks;
- Oocaboolina Outstation with residence, vehicle shed, stone tanks and sheep yards;
- Nudlamutana hut and well with residence, yards, windmill, well and stone tank;
- Idnina stone and iron house, crutching shed, yards, stone tank and windmill; and
- Illinawortina stone ruins, which represent a total pastoral complex of that era.

Heritage Branch, DEH should be consulted before obtaining specialist advice on methods and techniques to conserve built heritage. Any work on the Bolla Bollana structures require the provisions of the *Development Act 1983* to be followed.

Objectives

Adnyamathanha *muda* and cultural heritage is respected and the traditional owners' knowledge factored into park management decision-making.

Archaeological, cultural and built heritage sites are conserved and protected and (where appropriate) the park's cultural heritage resources made available to park visitors and suitable interpretive material provided.

Strategies

- With guidance from the Adnyamathanha traditional owners and in consultation with DAARE, DEH Heritage Branch and other relevant authorities encourage and support research that may help to identify and protect stories, known or relocated sites and objects of archaeological, anthropological, cultural and historical significance located in the park.
- Develop interpretive material and tourism programs for visitors and where appropriate, present individual cultural heritage sites for public access. Utilise the Balcanoona precinct as an interpretive location, using the buildings, yards and other pastoral infrastructure located there (and at other sites) for explaining the pastoral and cultural history and other aspects of the park to visitors.
- Consult the Adnyamathanha traditional owners and relevant Aboriginal heritage authorities, in decisions regarding the management of Indigenous cultural heritage.
- Where required, follow the notification process as set out in the ILUA for on-ground works within the park.

5 ZONING

Section 39 of the *National Parks and Wildlife Act 1972* provides for the designation of zones in a reserve. Zoning aims to ensure that public use and management actions remain compatible with the protection of park values and constrains the use of land in zones to the conditions specified in an adopted management plan.

The management zones described below and shown in Figure 3, establish a framework for the sustainable use of the park during the life of this plan.

The Vulkathunha-Gammon Ranges National Park is recognised as having special 'wilderness' qualities and associated visitor expectations, habitat areas of particular importance for threatened species, sites of Indigenous and non-Indigenous cultural heritage significance, and an existing pattern of cultural use that differ in some ways to other national parks. In particular, in one section of the park, a hunting zone will be set aside for Aboriginal people.

A zoning strategy is required that accommodates potentially competing uses and balances overall park management, while still protecting park values. This management plan designates some broad land use zones (described below) as a framework for the sustainable use of the park. Within these zones, there may still be sites or localities where access is temporarily or permanently prohibited or restricted and activities regulated for cultural or environmental reasons.

It is proposed to implement management strategies as per the zoning prescriptions outlined in the following sub-sections.

Strict Protection Zone

Land within this zone includes the park's most important and often its most fragile environmental assets. The intention is to minimise human disturbance to these environments, but still allow well-equipped park visitors, travelling on foot, to have a wilderness experience. Management input will be restricted to those activities seen as essential to maintain wilderness values. Signage and markers will only be installed where absolutely necessary to minimise public risk and environmental damage. All vehicles (including management vehicles) are prohibited in this zone (except in emergencies) and no further tracks or trails will be constructed. Feral animal control operations will be undertaken by air or on foot.

Prescription

- Within this zone, keep built construction and management intrusion to an absolute minimum with the exception of works required for public safety.

Conservation Zone

These lands abut the Strict Protection Zone and may contain rare or endangered species and other significant natural and cultural values, but are generally of a lesser overall environmental quality than the Strict Protection Zone. This zone serves as a buffer between the Strict Protection Zone and the Visitor Use Zone. Facilities will be restricted to walking trails and associated signage. Public access by vehicle is generally prohibited. DEH-approved vehicles may utilise designated service tracks for management and emergency purposes.

Prescription

- No management construction or intrusion within this zone except for public safety, simple walking trail markers and minimal interpretive signage. Minor track work is permitted.

Visitor Use Zone

This is the zone with the highest levels of visitor use and takes in roads, campsites, interpretive (including heritage) sites and trails, overnight accommodation and park administration, offices and residences. These are the places most affected by visitor use, but only comprise a small percentage of the total park area. Extreme care is still required within this zone to lessen the impacts of physical development on park values. Along public access roads and tracks, the Visitor Use Zone is designated as a nominal 100m either side of the centre line of the road or track.

Some visitor facilities are sited around the Balcanoona Park Headquarters and the development plan for that precinct should be updated and implemented. This action plan should be extended to deal with visitor facilities in this zone throughout the rest of the park. The intention is to prepare an overall visitor facilities plan for the park and implement progressively, focussing on the Park Headquarters and on various historic and cultural day visitor sites, as well as on camping areas, car parks, roads and access tracks.

Prescription

- Confine any significant built development to this zone.

Cultural Use Zone

This zone is located within the 'Plains Block' leading out to the edge of Lake Frome. It is legally available for some time each day for Adnyamathanha people to hunt game, subject to and in accordance with any permissions granted by the Board. It is understood that currently, hunting, mostly for Red Kangaroos and Emus, takes place mainly south of the track between Balcanoona and Lake Frome and west of the pipeline track. Hunters will be required to confine their activities to this area.

Hunting use is expected to be subject to prior notification and concurrence of the Senior Ranger (or other person with management responsibility) at Balcanoona. Park visitors will continue to have access through the zone to view Lake Frome at those times of the day not designated for hunting.

Consultation should take place with the local Adnyamathanha community to ascertain their needs and to ensure persons who are likely to hunt in the park abide with any conditions set by the Board. To limit any impacts this activity might have on wildlife populations or the environment, on-going hunting of Indigenous game animals should be subject to routine monitoring and any conditions set down in the park's wildlife management strategy (see Section 6.4).

To minimise public risk, signs have been erected to advise visitors of the special arrangements applying in this zone. Advice has been received from the South Australian Government Captive Insurance Corporation (SAICORP), which has recommended that the information sign on the entry track to Lake Frome at Balcanoona be modified to indicate this is an Adnyamathanha Hunting Zone and include the times when access or occupation is not permitted.

Similar signage should be erected at other locations where park visitors could access the cultural use zone. It is also recommended that any future updates to park brochures, information provided at information bays and maps of the area be changed to include similar wording.

The Moomba-Adelaide gas pipeline crosses this zone. Third party access along this easement is permitted, provided it is directly related to the use and maintenance of the pipeline. Access by others along the pipeline easement requires the approval of DEH and the general public is normally not permitted. Ongoing liaison should occur with the relevant organisations involved with the pipeline track, so that all contractors and/or personnel working within the park are aware of the hunting provisions.

Prescription

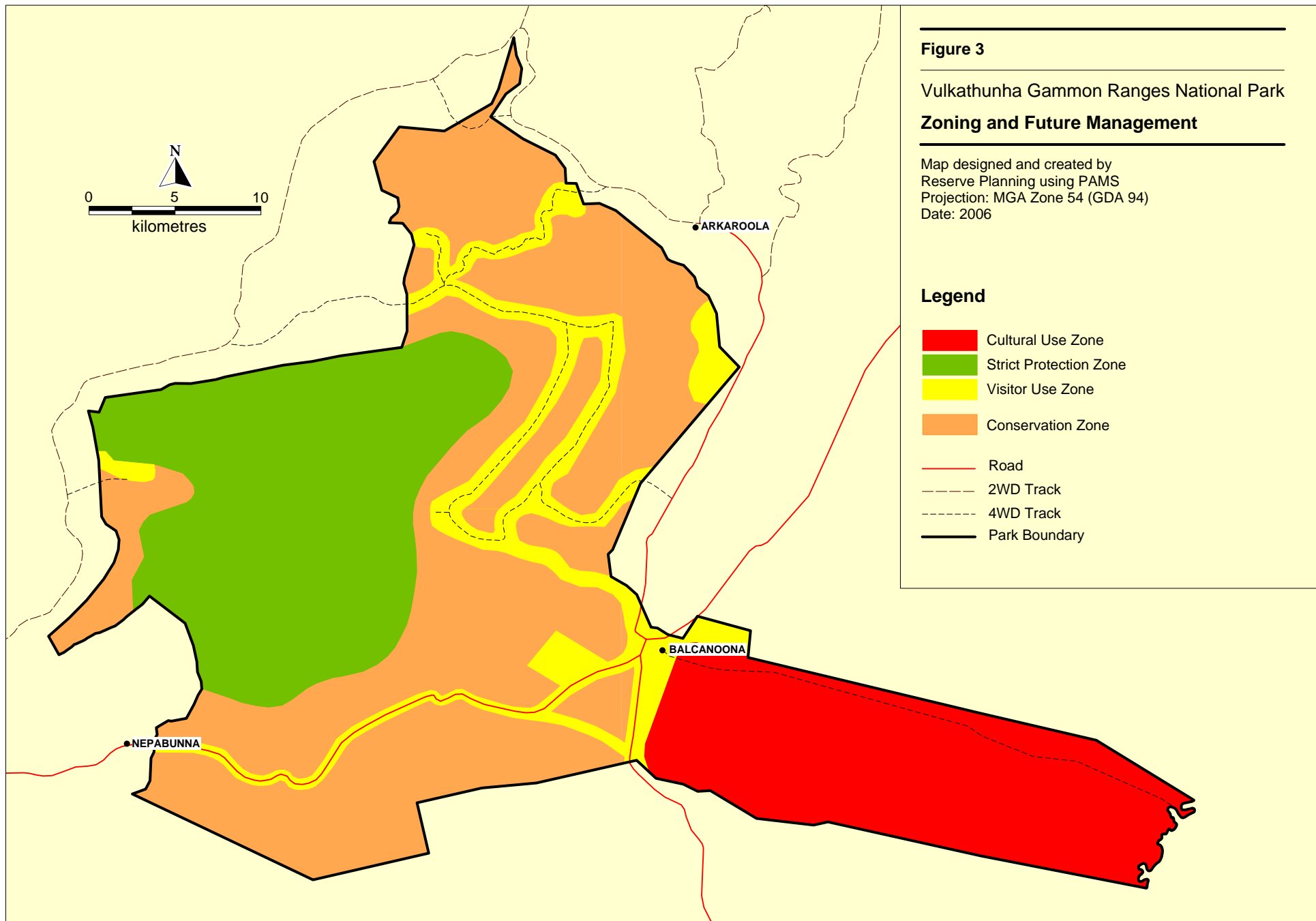
- Allow Adnyamathanha hunting in the Cultural Use Zone in accordance with the provisions of this management plan, subject to any permissions granted or conditions set by the Board. Undertake the risk minimisation initiatives referred to above and monitor use.

Objective

The park is managed according to zoning prescriptions that adequately reflect the management objectives and special attributes of particular parts of the park, thereby ensuring appropriate public use, landscape protection, conservation of wildlife habitat and heritage sites, and sustainable cultural use.

Strategy

- Designate the uses and implement management of the park according to the zoning prescriptions outlined in this management plan.



6 MANAGING NATURAL HERITAGE

6.1 Geology, Soils and Landform

The Northern Flinders Ranges is part of the Adelaide Geosyncline. Approximately 1,100 million years ago movements within the Earth's crust caused the ancient land surfaces to stretch and sink along a line generally represented by today's Flinders and Mount Lofty Ranges. Sediments were laid down into this sunken area. The deposition of sediments continued over many hundreds of millions of years. The depositional climates changed (marine, glacial and delta) and a varied sequence of sediments of different thickness were laid down. Altogether, sediments to a depth of nearly 20km were deposited into the geosyncline.

About 570 million years ago the area was flooded by the sea bringing new life forms to the area. These are represented today in the rich fossil resources of the Flinders Ranges. Approximately 500 million years ago the geosyncline was folded and uplifted to create the Northern Flinders Ranges. They emerged as a series of synclines and anticlines (concertina hills and valleys). The tops of the hills were often fractured in the folding process and provided significant lines of weakness for the erosion by wind and water that was to follow.

The mountain chain eroded at different rates depending upon which sediments were exposed and their relative hardness. Sediments like the quartz sands in the Wilpena group of sediments were compressed and changed during the mountain building process from sandstone to quartzite. The resultant Pound quartzite was very resistant to erosion and its presence in the Gammon Ranges today forms the major elevated and rugged landscape features of the park. By comparison the softer limestones and shales eroded much more quickly, and in fact they no longer overlay the Pound quartzite on the ridges, where they have been completely removed by erosion. The limestones still overlay the quartzite in the valleys, for example in Mainwater Pound where the reef limestones of the Hawker group still cover the Pound quartzite.

In some locations erosion breached the Pound quartzite and exposed the underlying siltstones, limestones and glacial deposits of the Umberatana group. These can be seen in the Illinawortina Pound area of the park.

In locations of intense folding, daipirs have been formed. Daipirs consist of rafts of highly fractured and brecciated rock, areas of literally, scrunched up rock, that are often intruded by volcanic flows, sometimes with fluid channels containing precious metals. These diapiric areas were important for nineteenth century copper and gold miners.

The spectacular rocks and landform of the Gammon Ranges are probably the things that most impress visitors new to the area. The region's geological/geomorphological story, involving fossils, structures, stratigraphy and mineralogy, is one that warrants interpretation (and protection) linking as it does to the history of mining and of course, the stories and culture of the Indigenous inhabitants. These landscape features are integral to the spiritual beliefs of the Adnyamathanha, and access to certain locations and sites may be culturally proscribed, not only for those with Aboriginal ties but for other persons.

The soils of the Gammon Ranges can be divided into two main groups; reddish loams and deep duplex soils. All soils in the Vulkathunha-Gammon Ranges National Park tend to be alkaline in nature.

The reddish loams are more common and include two shallow soils. One shallow loam is derived from quartzites and sandstones and therefore, is sandy and siliceous, generally occurring on the higher slopes. The other reddish loam is derived from shales, siltstones, limestones and dolomites and is therefore powdery and calcareous, usually on the foothills and the Plains Block (it is the preferred soil of burrowing animals). Both of these soils are gravelly throughout their profiles.

The third type of reddish loam is much deeper and is found in the valleys and depressions associated with the quartzite and sandstone areas. These soils can also be found near the channels of the braided outwashes in the Balcanoona Environmental Association and may have a fairly high content of soluble salts.

Of the deep duplex soils, one type is related to the stony plains, pediments, tablelands, and the broad undissected areas of alluvial fans. The structure of the alluvial horizons is generally poor and when dry they set hard, which makes moisture penetration from rainfall difficult. Another duplex soil type is found on steeper slopes and hills, and has a loamy surface.

Deep cracking (self-mulching) unstable clays occur in open patches on the Gammon Plateau, generally surrounded by large stands of mallee. The open areas are remarkable in that they do not seem to have been affected by soil erosion, and are generally flat. In dry weather they are easy to walk over, but the clays become soft and weak after rain.

The sporadic and often violent nature of precipitation can cause quite severe erosion. Other soil erosive causal factors are over-grazing by introduced animals, or poorly sited or inappropriate earthworks and road/track making. To facilitate the rehabilitation of any degraded areas it may be necessary to manage access and vegetation (ie by undertaking measures that may include access relocation or exclusion, natural regeneration, revegetation or pests plant removal). Soil erosion control programs should also factor in the need to limit the impact of grazing animals; such as over-abundant native fauna or introduced rabbits, goats, donkeys and horses. It is important to recognise that soil/plant management can be an important step towards landscape scale restoration.

Objectives

The cultural and spiritual value, to the Adnyamathanha people, of the park's rocks, soils and landform are recognised and respected and factored into park management.

The geology, fossils, soils and landforms of the park are protected from adverse impacts and visitors are informed on the geological and geomorphological values of the park and the region generally, and made aware of places/objects of significance to the traditional owners.

Patterns of use, park developments and park ecosystems overall are managed in a manner that minimises soil disturbance and soil erosion. Where feasible, soil conservation measures are undertaken to remedy any existing damage, and erosion and salinity changes limited to natural processes.

Strategies

- The Board to take account of Adnyamathanha spiritual and cultural values when planning for future landuse or visitor access, or when undertaking management activities and development works that might impact on rocks, soils or landforms. Where required, follow the notification process as set out in the ILUA before undertaking any earthworks. Permit public access only in designated areas and on designated tracks/trails; restrict access to sensitive areas by zoning exclusions and by erecting appropriate barriers.
- Identify specific areas of the park where soils are degraded, or susceptible to degradation, and would benefit from preventative/remedial management strategies and implement appropriate programs of rehabilitation when and where necessary, setting up photopoints, exclusion plots or transects to monitor erosion control programs and erosion sites of concern.
- Assess soil types and properties, particularly erosion potential, when planning for future land use or visitor access, incorporating appropriate design features into park developments to minimise soil erosion and reduce the risk of accelerating the soil erosion process.
- Gather information and data on places of cultural and spiritual significance (if appropriate) and the geological and geomorphological processes operating in the park to assist in park management, providing information signs and interpretive material to make visitors more aware and encourage them to use designated routes and avoid erosion-prone areas.
- Maintain liaison and work cooperatively with the South Australian Arid Lands Natural Resources Management Board.

6.2 Hydrology

Surface Water

In an arid area with unpredictable rainfall, permanent surface water is relatively uncommon. The Vulkathunha-Gammon Ranges National Park does, however, have a few free flowing springs that provide a small amount of permanent water. These springs, such as Weetootla, Camel Yard and McKinlay springs are critical to the survival of animals, especially during droughts, but also provide habitat for some unique aquatic plants and animals, particularly native freshwater fish. Some of these springs and creeks are of spiritual significance to the Adnyamathanha and as a consequence, access to certain locations and sites may be culturally proscribed, not only for those with Aboriginal ties but for other persons.

When a large rainfall does occur, the stream channels are not large enough to contain the water and flash flooding occurs. Flash floods tend to subside quickly and surface water in general does not last long due to the very high evaporation rates experienced in this region. These flash floods are seen as natural phenomenon, but over-grazing in the catchment area, or inappropriate earthworks could exacerbate flows (and associated erosion).

A substantial amount of data has been collected on the seasonality and intensity of rainfall events in the arid Gammon Ranges environment. For example, the adjacent Wooltana property is understood to have very comprehensive rainfall records, dating back to the 1870s. Since 1988 the Scientific Expedition Group has been monitoring rainfall using tipping bucket rain gauges and electronic data loggers in the Arcoona Bluff area of the park. The rainfall-monitoring program for the park should be reviewed, to ensure that the most useful data is collected.

Balcanoona Creek is represented in the park at all stages; from high up in the catchment where the stream moves quickly down rocky hills to the plains, where the creek moves more slowly across more sandy sediments until it empties into Lake Frome. Protecting this wholly contained catchment is considered a most important priority.

Groundwater

There are two types of aquifers that yield water for the bores, wells and springs in the park:

1. Unconsolidated sediments of sand, gravel, and boulders filling shallow local basins, valleys, channels and outwash deposits of similar materials in deltaic fans form. The water is held in the gaps in the loose material found in these areas, is reasonably easy to access, heavily dependent on rainfall and therefore relatively fresh. Almost all of the wells are associated with rubble-filled streambeds or small basins behind restrictions caused by the narrowing or barring of valleys by resistant rock.
2. Fractured rocks with joints and fissures. The water percolates into cracks in the rock and is stored there.

Groundwater is important for sustaining park operations. There is a main bore (with submersible pump) at Balcanoona that supplies the park headquarters, plus wells at Grindell's and Nudlamutana, that supply water for visitors and fire-fighting. These and other sources of groundwater must be managed sustainably and selected water points properly maintained.

Objectives

The cultural and spiritual value, to the Adnyamathanha people, of the park's springs and watercourses is recognised and respected and Indigenous knowledge factored into park management.

The environmental health of the springs and creek systems is maintained to conserve water-dependent ecosystems, associated aquatic habitats and native freshwater fish communities while ensuring on-park works and public access do not impinge adversely on such areas and a strategy for sustainable groundwater use and management is developed and applied.

Strategies

- The Board to take into account the Adnyamathanha spiritual and cultural values of springs, waterholes and watercourses when planning for future landuse or visitor access, or when undertaking management activities and development works.
- Participate in regional management programs, in partnership with relevant authorities, in support of management schemes designed to minimise negative impacts to groundwater reserves.
- Manage on-park (and collaborate with neighbours regarding any off-park) hydrological activities, minimising any adverse impacts to the creek systems or groundwater assets of the Park, and undertake remedial works when and where necessary and feasible.
- Document any changes to aquatic ecosystems following changes in park management (eg since the cessation of stock grazing) reductions in feral animal numbers or in overall grazing pressure.

- Encourage and support the ongoing involvement of research institutions and interested volunteers in the monitoring of rainfall, water quality, ecological processes and associated management programs.

6.3 Native Vegetation

The Gammon Ranges has a diverse and botanically interesting flora, the park's vegetation having affinities with geographically distant locations in New South Wales and South Eastern Australia. Many species exist in the Gammon Ranges at the limit of their geographic range. Several species occur here as relicts (eg *Acacia araneosa* Spidery Wattle) in habitat refuges surviving from an earlier period of more temperate climate. The vegetation of the Gammon Ranges appears to have strong affinities to the underlying geology. This is indicated by some dominant species being found only in particular areas.

The Gammon Ranges has records of 977 plant species, a number of which are of conservation, botanical or biogeographical significance. There are three species found in the park rated as having conservation significance under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and 42 species rated as having conservation significance under the *National Parks and Wildlife Act 1972* (Appendix A includes a list of plants of conservation significance; threatened species status codes are explained in Appendix B).

A special effort should be made to protect and nurture threatened species, by identifying the threats to their survival and undertaking management to mitigate them. One project underway at present (2005) involves protecting stands of the Spidery Wattle (*Acacia araneosa*) from rabbits. The native vegetation in the park, although appearing superficially intact, has suffered from decades of grazing (formerly by domestic stock, as well as feral and native animals) and invasion by introduced plants. The main threat to plant biodiversity conservation is perceived to be the high level of introduced species, but there is always the possibility that inappropriate human activity could inadvertently impact upon threatened plants.

The Board should determine and adopt clear restoration goals that are aligned with current restoration theories. A reduction in total grazing pressure may be required before any significant ecological recovery occurs. To achieve the desired results, not only feral grazing animals, but also native species may need to be culled to gain most benefit. Due to the arid environment and unpredictable rainfall it may take many years to achieve a positive response in vegetation recovery as this is dependent on the episodic rainfall events that stimulate germination.

With limited resources, the management of native vegetation within the park requires an approach that applies those resources to maximum ecological benefit. To date this has involved controlling selected introduced plants, focussing on plant communities of special conservation significance and using 'best practice' strategies to ensure their survival. The Board are prepared to join with the managers of land adjacent to the reserve in managing native vegetation in a manner that protects and improves biodiversity and contributes to improved habitat condition right across the region.

From time to time, Aboriginal people may want to pick native fruits from the park for 'bush tucker' (eg quandong fruit) or gather plant materials for craftwork. Such traditional uses are acceptable, provided they are culturally appropriate and ecologically sustainable. Aboriginal harvesting of native plants should be in accordance with this management plan or any permissions and conditions set by the Board. It has been suggested that further investigation could reveal the ecological benefits of traditional Indigenous harvesting practices. If this proves to be the case, consideration should be given to devising practical ways of incorporating those activities into future vegetation management regimes.

A series of permanent monitoring sites including photopoints has been established throughout the park in a range of vegetation communities. Park staff conduct regular monitoring of these sites and the information obtained is stored on a centralised DEH database. Ongoing monitoring of these sites enables long-term vegetation changes and trends to be evaluated including the impact of feral animal control programs. It is important to recognise that soil/plant management can be an important step towards landscape scale restoration.

In the context of scientific research too, some of the native plants that occur on the park are of special significance to the Adnyamathanha people. That significance should be taken into consideration and the views of the traditional owners sought, before permits are issued by DEH to

take or study these plants. The Board will be consulted on such matters. Scientific permit applicants should be made aware that special conditions might apply in this co-managed park.

Four main vegetation communities variously dominate throughout the park: woodlands, shrublands, scrublands and grasslands. These are described below.

Woodland

Along the fringes of the permanent waterholes and creeks can be found *Eucalyptus camaldulensis* var. *obtusa* (River Red Gum) woodland, which sometimes occurs with *Melaleuca glomerata* (Inland Paper-bark).

Tall Open Woodland

Eucalyptus intertexta (Gum-barked Coolibah) is the dominant species of the tall open woodlands that occur on the lower slopes of the Mainwater and Illinawortina Pounds and valleys where the lighter soils occur over Balcanoona dolomites and the Wonoka, Bunyeroo and Brachina siltstones and tillites.

An understorey of shrubs is associated with *Eucalyptus intertexta* woodland and the density and occurrence of these shrub species is influenced by both slope and aspect of the valley alignments. The shrub understorey is dominated by *Acacia victoriae* (Elegant Wattle), *Acacia rivalis* (Silver Wattle), *Dodonaea lobulata* (Lobe-leafed Hop-bush), *Senna* and *Eremophila* species.

Eucalyptus intertexta on higher slopes is often associated with *Triodia irritans* (Porcupine Grass) and a discontinuous ground cover of low shrubs and herbaceous species such as *Sida*, *Solanum*, *Senecio*, *Rhagodia* species, *Radyera farragei* (Desert Rose Mallow), *Lavatera plebeia* (Australian Hollyhock), *Enneapogon avenaceus* (Common Bottle-washers), *Aristida nitidula* (Brush Three-awn) and *Danthonia caespitosa* (Common Wallaby-grass). The southern relict species, *Calytrix tetragona* (Common Fringe Myrtle) and *Philotheca angustifolia* (Narrow-leaved Wax-flower), also occur in more rocky sites. These two species are commonly found in upper slope and ridge top shrublands. *Callitris glaucophylla* (White Cypress-pine) is also found on upper slopes with quartzite boulders and on flood deposited shingle beds.

Other tall shrubs are sparsely distributed throughout the woodland. These occur without defined habitat requirements and so are found in almost all vegetation associations. These species include *Pittosporum phylliraeoides* (Native Apricot), *Alectryon oleifolius* ssp. *canescens* (Bullock Bush), *Santalum lanceolatum* (Plumbush), *Capparis mitchellii* (Native Orange), *Codonocarpus pyramidalis* (Slender Bell-fruit) and *Hakea ednieana* (Flinders Ranges Corkwood). *Eucalyptus intertexta* can also be found in association with *Eucalyptus camaldulensis* or with *Callitris glaucophylla* with or without *Casuarina pauper* (Black Oak) or *Acacia aneura* (Mulga).

On lighter, calcareous soils *Casuarina pauper*, *Callitris glaucophylla* open woodland occurs often with *Acacia aneura*.

Low Open Woodlands

The *Acacia aneura*, *Casuarina pauper* woodland occurs as a low open formation and is widely distributed throughout the park. It is sparsely distributed through the *Eucalyptus intertexta* woodland but dominates on upper slopes and rocky ridge tops on Pound quartzites and Balcanoona tillites. This is particularly evident in the north of the park. The understorey commonly consists of *Senna artemisioides* ssp. *oligophylla*, *Acacia* and *Eremophila* species and *Dodonaea microzyga* on the foothills of the Balcanoona Range on tillites and Angepena siltstones.

Pure stands of *Acacia aneura* also occur as discrete groves on the lower slopes and occur with grass species on the 'Plains Block'. Many of these groves are degenerate with senescent trees having being killed by heavy grazing pressure from goats and rabbits. *Acacia aneura* regeneration is only occurring in rocky areas, while on the plains there is no evidence of any regeneration. It is hoped however, that control of grazing pressure through 'Operation Bounceback' will have long-term benefits in such situations.

Callitris glaucophylla (White Cypress-pine) also occurs as a co-dominant species in some woodlands of the lighter calcareous soils. The native pine also occurs as discrete woodland on the upper slopes and ridges of the main ranges, particularly on areas with quartzite boulders, such as those on the eastern slopes south from Benbonyathe Hill. *Casuarina pauper* (Black Oak) exists as pure stand woodland on areas of limestone and dolomite.

Tall Shrublands

Tall shrublands of the park are dominated by Mallee species and three Mallee associations are recognised. The other tall shrubland is *Melaleuca glomerata* thickets occurring along the creeklines.

Eucalyptus gillii (Curly Mallee), a species of limited and disjunct distribution, occurs on lower slopes of the Skillogalee dolomites. The epicentre for this Mallee species within the ranges is considered to be in the vicinity of Mount Warren Hastings (Ball, 1978), with well-developed stands in Illinawortina Pound and along the foothills of the Balcanoona Range. *Eucalyptus gillii* with *Eucalyptus intertexta* is associated with a sparse occurrence of shrubs (*Myoporum* species, *Senna* species, *Acacia rivalis* and *Triodia irritans*) and emergent small tree species. In the north of the park *Eucalyptus gillii* is associated with an understorey of *Triodia irritans* with few, if any, other species.

On the calcareous soils of the Angepena siltstones, the Red Mallee association of *Eucalyptus socialis* (Beaked Red Mallee) and *Eucalyptus dumosa* (White Mallee) replaces *Eucalyptus gillii*. This association occurs on the lower slopes mainly with an understorey of low shrubs and grasses of *Enchylaena tomentosa* (Ruby Saltbush), *Rhagodia spinescens* (Spiny Saltbush), *Enneapogon nigricans* (Black-head Grass), *Danthonia* spp. (Wallaby Grass), *Stipa* (Speargrass) spp. and *Triodia irritans* (Porcupine Grass). *Eucalyptus* aff. *viridis* (Green Mallee) occurs as a mallee species in isolated associations with *Eucalyptus socialis* and *Eucalyptus dumosa*. On gravelly shallow soils *Dodonaea lobulata*, *Eremophila maculata* (Spotted Emubush), *Eremophila longifolia* (Weeping Emubush) and *Eremophila freelingii* (Rock Emubush) in association with *Stipa*, *Sclerolaena* and *Zygophyllum* species occur as an understorey.

The third mallee community of particular significance is *Eucalyptus flindersii* (Flinders Grey Mallee) that is associated with the southern relict species *Melaleuca uncinata* (Broom Bush), on the quartzites of the Gammon Ranges plateau. *Allocasuarina muelleriana* spp. *alticola* (Flinders Ranges Oakbush) and *Acacia rigens* (Nealie) also occur on the plateau in association with another southern species, *Calytrix tetragona* (Common Fringe Myrtle). An interesting ecotone between the plateau mallee vegetation and the *Callitris glaucophylla* woodland of the upper slopes exists in many areas. *Triodia irritans* occurs in these sites as a homogeneous community covering large discrete areas. These *Triodia* species hummock grasslands are the largest in the park.

Along most ephemeral creeks *Melaleuca glomerata* (Inland Paperbark) occurs as a tall shrubland as a fringing community along more permanent streams and often as an understorey to sparsely distributed *Eucalyptus camaldulensis*. In a prolonged drought *Cymbopogon ambiguus* (Lemon Scented Grass), *Aristida nitidula*, *Maireana pyramidata* (Black Bluebush), *Pterocaulon* and *Senecio* species have colonised many dry stream beds and formed an understorey to the *Melaleuca glomerata* thickets. This is an important riparian community utilised by a large number of bird species and occupied by the Yellow-footed Rock-wallaby, where the community exists within its habitat range.

Shrubland

The tall shrublands merge with shrublands and are often synonymous (Low Open Mallee). The most extensive shrubland within the Park is that dominated by the *Acacia rivalis* (Silver Wattle) and *Acacia victoriae* (Elegant Wattle) association. *Acacia rivalis* has been considered rare but in the central inter-range plains and valleys it forms discrete and uniform shrubland thickets. It occurs extensively on the Balcanoona and Skillogalee dolomites and the Angepena siltstones.

On the lower slopes of the ranges *Eremophila freelingii* (Rock Emubush) and *Acacia aneura*, occur over *Senna* species and *Dodonaea lobulata*.

On the sandy dunes of the Balcanoona Plains *Acacia aneura*, *Acacia ligulata* (Umbrella Bush) and *Acacia victoriae* dominate with an understorey of *Maireana pyramidata*, *Rhagodia parabolica*, *Enneapogon avenaceus*, *Ptilotus obovatus*, *Goodenia vernicosa* (Wavy Goodenia), and *Danthonia* species. It is in these areas that the regeneration of *Acacia aneura* has been severely repressed due to the grazing of rabbits that prefer the sandier soils of the plains. Mulga Woodland on sand plains has been listed as vulnerable under the Provisional Threatened Ecosystems of South Australia (2001).

On the 'Plains Block' towards Lake Frome, chenopod low shrublands dominate. *Maireana aphylla* (Cotton-bush) occurs in frequently inundated areas with a variety of ephemeral plants. On the palatable saltbush and *Maireana astrotricha* (Low Bluebush) flat, ephemerals and grasses can cover the area after summer rains. *Maireana pyramidata* is often associated with *Sclerolaena patenticuspis* (Spearfruit Bindyi), *Sclerolaena tricusps* (Three-spine Bindyi), and sometimes

Alectryon oleifolius ssp. *canescens*, *Eucalyptus camaldulensis* and *Capparis mitchellii*. *Maireana sedifolia* (Pearl Bluebush) occurs less commonly, as it is restricted to calcareous rises and is often found as an understorey to *Eucalyptus gillii* in these locations. *Maireana sedifolia* is also found with *Sclerolaena* species and *Acacia* species on higher ground. On the 'Plains Block' close to Lake Frome the vegetation is dominated by the halophytic shrub species *Halosarcia* (Samphire), *Sclerostiga tenuis* (Slender Samphire), *Nitraria billardiarei* (Nitre-bush) and *Scaevola collaris*.

Grasslands

The Balcanoona Plains provide a mosaic of vegetation and landforms that are not well represented in the park. The most important of these are the *Astrelba pectinata* (Barley Mitchell Grass) grasslands that have been greatly reduced by pastoral activities, due to the palatability of the species. *Astrelba pectinata* occurs in association with *Danthonia* species, *Stipa* species, *Eragrostis setifolia* (Bristly Love-grass) and *Enneapogon avenaceus* occurs with or without *Acacia*, *Senna* and *Eremophila* species or as pure grassland. In the vicinity of Lake Frome, *Acacia aneura* (Mulga) tall shrubland is replaced by *Zygochloa paradoxa* (Sandhill Cane-grass).

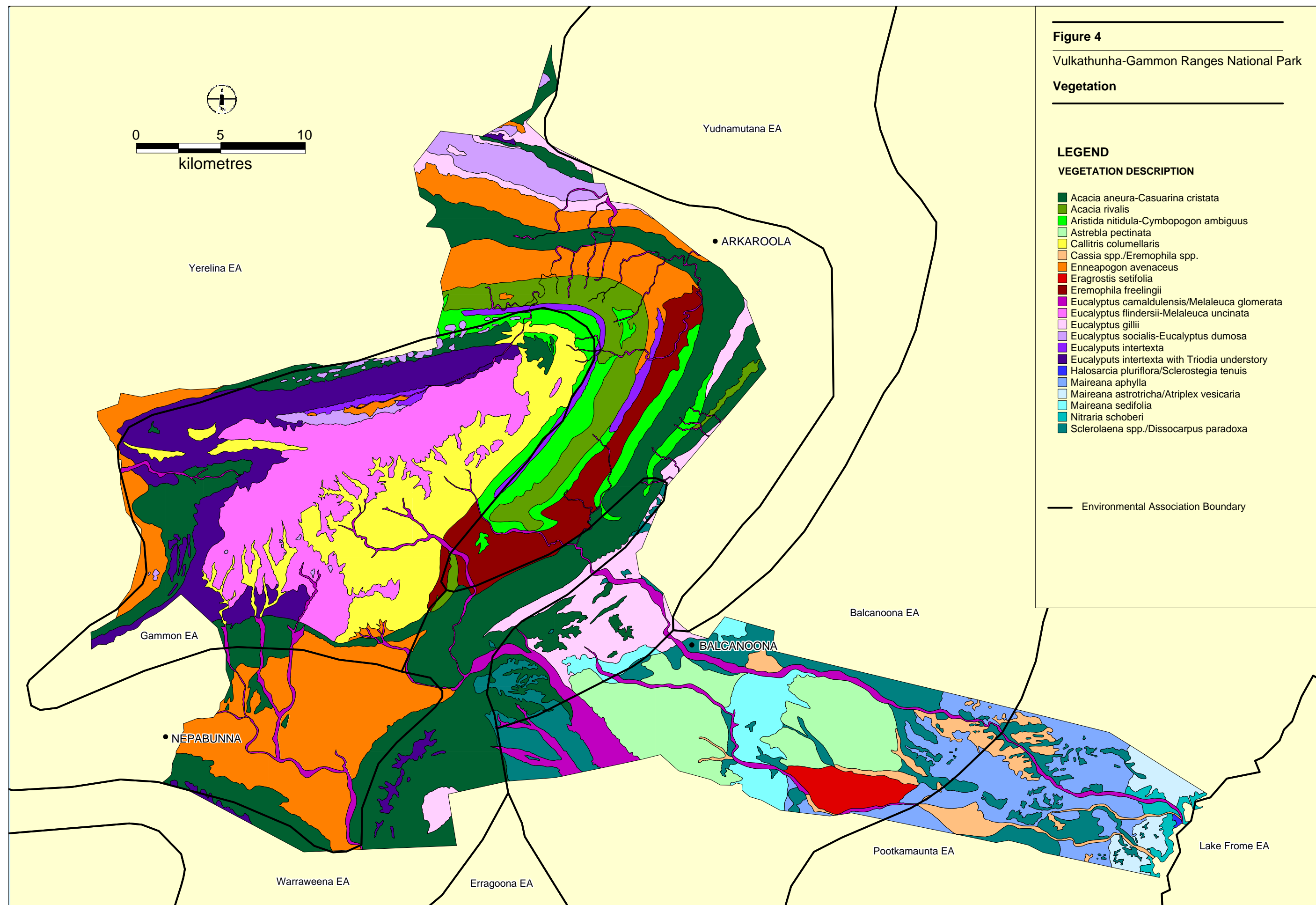
Objectives

The cultural and spiritual value of the park's plants and vegetation to the Adnyamathanha people is recognised and respected, with Indigenous knowledge factored into park management activities and scientific research. The Adnyamathanha traditional owners are able to gather native plant material for traditional uses in a culturally acceptable and environmentally sustainable manner.

Native vegetation in the park overall is conserved/restored and threats to biodiversity reduced, particularly to plants and communities of conservation significance and any changes to vegetation community structures over time are monitored, and in particular, areas of significant habitat, or threatened species, protected and managed.

Strategies

- Continue with projects designed to enhance biodiversity and restore ecosystems including, when and where necessary, the regulation of total grazing pressure.
- Comprehensively monitor vegetation community changes; particularly in those areas known to have had significant understorey change in the past, where management effort has been applied, or conversely, where regeneration of canopy species appears absent.
- Monitor the stability and manage threats in those areas that contain plant species that are listed as threatened or of biogeographical significance.
- Consult the Board when taking decisions on scientific research and before issuing permits involving native plants and record and incorporate relevant Indigenous knowledge as it pertains to vegetation management.



6.4 Native Fauna

The distribution of fauna species in the Northern Flinders Ranges is of biogeographical importance. As with the flora, the comparatively moist habitat of the Ranges compared with the surrounding plains has allowed more southerly species to maintain viable populations in the arid north. Sadly however, colonial settlement sounded the death-knell for many native animals; many small to medium sized mammals and some reptiles (up to 22 animal species in total) having become locally extinct by 1900. None the less, the park has records of 200 fauna species.

Species surviving in the park today include the nationally vulnerable Yellow-footed Rock-wallaby (*Petrogale xanthopus*), the Narrow Nosed Planigale (*Planigale tenuirostris*), the Fat Tailed Dunnart (*Sminthopsis crassicaudata*) and the Stripe-faced Dunnart (*Sminthopsis macroura*). There are in all, seven fauna species recorded in the Park that are rated as being of conservation significance under the *National Parks and Wildlife Act 1972* and two species rated as having conservation significance under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. (Appendix A includes a list of species of conservation significance; threatened species status codes are explained in Appendix B). Although there is no immediate proposal, the reintroduction of locally extinct species may be considered in the future as part of a regional ecological restoration program.

Since the park was first proclaimed there have been quite a number of fauna surveys undertaken by DEH, tertiary institutions, researchers and volunteer groups. The results of all these surveys increased knowledge of the vertebrate fauna of the park and their habitat requirements. During 1998-99 DEH conducted further surveys of selected areas of the park, including the rugged and remote terrain of the Gammon Plateau. These more recent surveys added records of several new species for the park and the results are reviewed in Brandle (2001).

In addition to the above, regular surveys have been conducted since 1997 in the 'Plains Block' area to assess the impact of Rabbit Haemorrhagic Disease (Calicivirus) and what effect conventional rabbit control works might be having on small vertebrate fauna.

Some of the negative impacts of grazing animals and introduced predators are well known, but the more subtle changes to habitats and resident native animals brought about by pastoral use and as a result of introducing alien species, are only partly understood. More extensive surveys and management-oriented studies should result in better ecological management of the park's fauna but early indications are that the ecological recovery projects already undertaken have been beneficial. Aerial surveys of the Yellow-footed Rock-wallaby population on the park and Arkaroola commenced in 2000 and since then, animals counted have increased from approximately 400 to 680. This recovery is believed to be a direct response to feral animal control programs conducted under 'Operation Bounceback'.

Although sometimes contentious, as an integral component of managing overall grazing pressure to aid ecological recovery, it may become necessary to cull over-abundant populations of large native herbivores (viz Red Kangaroos and Euros). The numbers of large macropods have been surveyed in the past and some scientific data has been compiled that can be used to match optimum population densities against habitat types and prevailing seasonal conditions.

There are no current plans (2006) for a macropod culling program on the park and other techniques will be investigated to address the causes of elevated population levels. However, scientific advice may recommend culling as the only practicable way to meet ecological restoration objectives. For that reason, in accordance with section 38 (10a) of the *National Parks and Wildlife Act 1972* this management plan foreshadows that Red Kangaroos and Euros may be culled during the term of this plan if that is considered the only practicable option. Any population reduction activity should be subject to on-going monitoring and undertaken in an efficient and humane way. Adnyamathanha people should have priority use of any over-abundant native animals culled, but if not required, animals may be shot on a 'let lie' basis.

The Board will be integral to the monitoring, review and ongoing implementation of any animal control programs operating on the park. The CMA requires the Board to consider the requirements of the Adnyamathanha people by consulting ATLA about operational aspects when administering animal culling programs.

A few of the creeks in the park provide habitat for populations of fresh water fish, including the nationally vulnerable Flinders Ranges subspecies of the Purple-spotted Gudgeon (*Mogurnda clivicola*). It is important for the Board to be aware of the habitat requirements of these aquatic animals and ensure they are adequately protected and managed accordingly. Further research into these animals should be supported, and the species' ecological requirements factored into park management.

In the context of scientific research, some of the native animals that occur on the park are of special significance to the Adnyamathanha traditional owners. It is crucial in developing a management plan for a co-managed park that recognition and acknowledgment are given to cultural and spiritual beliefs of the traditional owners. This must extend not only to awareness and understanding but also in practice, when developing policies and making decisions regarding the management of resources, for example when consideration is being given to applications for scientific permits and the views of the traditional owners sought, before permits are issued by DEH to take or study native animals. The Board will be consulted on such matters. Scientific permit applicants should be made aware that special conditions may apply in this co-managed park.

It must be understood too that in Indigenous culture, Aboriginal people are inextricably linked to the land and using the term 'land' does not just mean soil and rocks. This term applies to all aspects of nature, including flora, fauna, the elements, geology and geography. An Indigenous Australian is an integral part of the environment and the environment is part of that person and their community.

It has been noted elsewhere in this plan that Adnyamathanha communities are made up of clans. Each clan has a totem, as does each individual. This totem signifies one's identity and relationship to others. Totems are symbols that can link individuals not only to the creature (eg birds, animals or reptiles) of their totem but to a place. In Indigenous Australian culture this is what is referred to as the 'Dreaming' or *Muda*. This spiritual and historical aspect of life encompasses all that there is - the environment, land, sky, the elements, creatures, plants and humankind.

Therefore, all management policies and procedures need to be developed with these relationships in mind. The significance of places, animals and plants in ceremonies, 'law', daily life, teaching, child-rearing practices and the preservation of traditions and culture cannot be overlooked. Anything that impacts on the environment and the 'land', impacts on the life and culture of those who are part of that land.

If co-management is to be effective, then genuine respect and recognition of the interests and cultural beliefs of the traditional owners is of paramount importance when developing land management practices and policies. Consultation with the Board should be standard procedure prior to the issue of scientific permits or approval being given for surveys to be conducted. The significance of certain locations, features or species are not always known by those other than traditional owners and the establishment of such a protocol should ensure that sites or resources of particular significance are not accessed, disturbed or damaged.

Genuine cooperation and consultation between the stakeholders in the development of all aspects of planning and management will ensure that not only are environmental resources sustained, but so is the cycle of spirit, culture and life for the traditional owners. Adnyamathanha hunting on the 'Plains Block' is not a significant environmental issue (it is considered to be ecologically sustainable, as only limited numbers of abundant species such as Red Kangaroo and Emu are currently taken). For the traditional owners to continue hunting is culturally appropriate and acceptable in a remote national park (subject to the public safety and legal considerations mentioned in the Zoning section of this plan) but should still be part of routine fauna monitoring/management. To ensure ongoing safe and sustainable Adnyamathanha hunting of traditional native food animals, this activity should be undertaken subject to any conditions set down in a wildlife management strategy produced in collaboration with the Board.

Objectives

The cultural and spiritual value, to the Adnyamathanha people, of the park's animals is recognised and respected and Indigenous knowledge factored into park management and scientific research. Adnyamathanha people can continue to hunt native animals for food in a safe, culturally acceptable and environmentally sustainable manner, in accordance with any permissions granted and conditions set by the Board.

All native fauna inhabiting or using the park is identified and protected, while park ecosystems are managed such that there is no further loss of native species. Habitat management projects are undertaken to support native wildlife and assist with species recovery and threatened species recovery projects, in particular the conservation of the Yellow-footed Rock-wallaby population, remain an ongoing focus.

Strategies

- Continue monitoring of the numbers of large macropods and Yellow-footed Rock-wallabies and undertake biodiversity conservation projects in association with ecological recovery programs. Prepare and implement additional wildlife management and recovery plans as necessary.
- As part of a regional ecological restoration program the reintroduction of fauna species that formerly occurred in the park could be considered, subject to ongoing threat abatement works. Species to be considered will be discussed with Adnyamathanha traditional owners.
- Identify and protect significant fauna habitats and integrate habitat restoration with revegetation efforts and introduced plant management programs. Monitor and manage the impacts of abundant native species and address the causes of artificially elevated population levels. If scientific advice is that culling is the only practicable alternative, undertake culling of over-abundant native species (viz Red Kangaroos and Euros).
- Consult the Board when taking decisions on scientific research and before issuing permits for research projects involving native animals and record and incorporate appropriate Indigenous knowledge into fauna management policies and procedures.
- Allow traditional hunting by Adnyamathanha people in the Cultural Use Zone in accordance with the provisions of this management plan and permissions granted and conditions set by the Board. Prepare and implement a wildlife management strategy that will help ensure the long-term, sustainable Adnyamathanha harvesting of Red Kangaroos and Emus.
- Encourage approved volunteer groups and individuals including Adnyamathanha people to conduct fauna surveys and undertake population monitoring. Encourage surveys for fauna species not recorded from the park and determine the habitat requirements of any new species located.
- Continue to gather information on native fish populations and their specific management requirements; take steps necessary to ensure their long-term survival.

6.5 Introduced Plants

The major pest plants occurring on the park are Salvation Jane (*Echium plantagineum*) found in small outbreaks on deeper soils where moisture levels are higher, Wild Hops (*Acetosa vesicaria*) that are very widespread, Horehound (*Marrubium vulgare*), Ward's Weed (*Carrichtera annua*) and Onion Weed (*Asphodelus fistulosus*).

Wild Hops and Ward's Weed, in particular, are so ubiquitous within the Flinders Ranges that control by conventional means does not seem possible. There are however, some encouraging prospects for successful biological control of Salvation Jane. The other pest plants are generally present in relatively small outbreaks and can be controlled by conventional weed control methods.

Control programs should focus on the plant species that pose the greatest threat to park values. In most cases however, success with introduced plant control can only be achieved by taking an integrated, regional approach and liaising with the managers of neighbouring properties is critical (de Preu et al 2002). There are likely to be future opportunities to do this within the Natural Resource Management program.

Oleanders (*Nerium oleander*) could become an invasive (as well as toxic) nuisance in the park environment. Some garden escapes have occurred into Balcanoona Creek in the past and may require regular monitoring and any re-infestations removed. Several species of Cacti occurring in the Northern Flinders have had control work done on them and a watching brief should be kept to ensure they do not become established in the park. Other introduced grass species in the park that have the potential to spread, such as Couch Grass (*Cynodon dactylon*) found in Weetootla Gorge and Buffel Grass (*Cenchrus ciliaris*) found near Balcanoona, need monitoring and control.

Objective

Pest and introduced plants are assessed, monitored and controlled (where feasible) with a view to eventual eradication if that is possible.

Strategies

- Fulfil the obligations of the *Natural Resources Management Act 2004* and undertake weed control programs as resources permit, with the priority on scheduled weeds of regional concern and those threatening park values.
- Continue with regional projects designed to control introduced plant populations and enhance populations of native species.
- Maintain liaison and work cooperatively with the South Australian Arid Lands Natural Resources Management Board.

6.6 Introduced Animals

Foxes, rabbits, cats, goats and donkeys have all contributed to the fragmentation of ecosystems in the Northern Flinders Ranges. In all, nine introduced animals have been recorded in the Vulkathunha-Gammon Ranges National Park. Of these introduced animals, arguably the most serious pest across the entire landscape has been the feral goat.

DEH undertook feral goat control projects from the time the park was first proclaimed. Goat densities of 15/km² were recorded in the mid-1980s and this was after some control work had already commenced. Aboriginal stockmen actively mustered goats between 1981 and 1991 and an estimated 90,000 goats were removed from the park by that means. The option to muster goats should be retained, as it provides commercial opportunities for the Adnyamathanha traditional owners when numbers of animals are high enough to make it worthwhile, particularly when it can be combined with helicopter mustering.

Since 1992 systematic shooting by the Hunting and Conservation Branch of the Sporting Shooters Association of Australia (SSAA) has occurred on the park three times per year, combined (at times) with helicopter-based shoots by DEH. Since that date, DEH and Hunting and Conservation Branch members have shot more than 27,000 goats. The number of goats mustered or shot was highest in 1994, but has declined markedly in the past few years, reflecting a significant decline in the feral goat population to less than one goat per square kilometre (de Preu et al 2002). The goat density had been 40 goats per square kilometre in 1992.

Re-infestation from surrounding areas is a perennial problem and a regionally coordinated approach is vital. This should include maintaining liaison with Aboriginal people and neighbouring property owners and encouraging their continued participation in the goat control program.

The success of the goat control program was augmented by the commencement of a broad scale fox-baiting program in October 2000. Dried meat baits containing 1080 poison are distributed at regular times of the year along the network of tracks and roads throughout the park and over a buffer area on neighbouring properties, subject to landowner approval. DEH has developed strict guidelines under permit from the Australian Pesticides and Veterinary Medicines Authority covering the distribution and handling of the meat baits. These include having secure storage, appropriate signage in place, notification of neighbours prior to baiting and ensuring bait free zones within 500m of campgrounds and day visitor areas.

In March 2001, a project to trial aerial baiting on the park and Arkaroola Sanctuary was commenced, the first such trial for South Australia. This method utilised a helicopter equipped with a Global Positioning System and provided a more effective method of bait delivery for the rugged and remote terrain that is the primary habitat for Yellow-footed Rock-wallabies. More recently, in 2004, a further trial of spreading baits from the air was undertaken using a fixed-wing aircraft. The advantages of aerial baiting are still being evaluated.

While it is recognised that a certain level of predation is probably integral to healthy ecosystems, fox and cat predation on native species is significant although it is difficult to quantify the impact. Aerial surveys of the Yellow-footed Rock-wallaby across the park indicate that numbers of animals are increasing, presumably in response to the reduction in fox (and goat) numbers. Feral cats are widespread and more difficult to control as they prefer live prey and do not readily take baits. Members of the Hunting and Conservation Branch regularly shoot cats during their tri-yearly visits and DEH has conducted opportune trapping, although this is extremely labour intensive.

Rabbits have been a serious problem in parts of the park, particularly in the softer dolomite or alluvium areas that are more favourable for warren construction. Infestations of rabbits can decimate native vegetation and add to the problems of soil erosion and lack of regeneration. A number of exclosures have been established throughout the park to monitor the impact of various grazing animals, including rabbits, goats and kangaroos. A large exclosure was constructed on the southern boundary of the 'Plains Block' in 1997 and rabbit control works conducted inside the exclosure. The outbreak of Rabbit Haemorrhagic Disease (Calicivirus) has resulted in a significant reduction in numbers of these pests across the park, and should be followed up with warren destruction where appropriate. Such works are subject to available funding and prior Aboriginal site assessment.

Intrusion by grazing stock from neighbouring properties occurs from time to time, particularly during dry seasons. While much of the boundary fencing has been upgraded to prevent incursion of grazing stock, liaison should occur with neighbouring property managers to encourage the appropriate management of stray animals.

Dingoes (*Canis familiaris dingo*) venture into the park from time to time, and the Dog Fence runs through the 'Plains Block'. These animals are top order predators and are considered a menace by pastoralists who run sheep. For the term of this management plan, all necessary steps will be taken to remove Dingoes from the park. To this end, the Board should collaborate with Dingo control authorities.

Horses and donkeys are perceived (by some) as an integral component of the 'Outback' and a historic link with South Australia's pastoral past. On the other hand, these animals can have deleterious effects on an arid environment. From time to time horses are brought into the park, mainly to support goat-mustering activities and tourist rides, subject to DEH approval. Provided that any associated environmental impacts remain minimal, that arrangement should continue. However, prolonged de-pasturing of horses in the park should not be permitted and the time they spend there should be kept to a minimum. Donkeys should be controlled.

The Board will be integral to the monitoring, review and ongoing implementation of the feral and introduced animal control programs operating on the park. The CMA requires the Board to consider the requirements of the Adnyamathanha people by consulting ATLA about operational aspects when administering animal culling programs.

From time to time, applications are made by persons who wish to use camels in national parks. This is not considered to be an appropriate use for the Vulkathunha-Gammon Ranges National Park.

Objective

Pest and introduced animals are monitored, controlled to a density where impacts are not a conservation concern, with emphasis on controlling those species posing the greatest threats to park values.

Strategies

- Maintain liaison and work cooperatively with the South Australian Arid Lands Natural Resources Management Board and fulfil the obligations of the *Natural Resources Management Act 2004* within allocated resources.
- Continue with the Vulkathunha-Gammon Ranges National Park feral goat control program, which may involve mustering, ground and aerial shooting. Encourage and support the regional feral goat control program and monitor the effectiveness of that program.
- Undertake control of goats, foxes, cats and donkeys as need and opportunities arise, techniques improve and resources permit.
- Continue broad scale fox-baiting program across the park and on Arkaroola and in cooperation with neighbours expand the baited area to include adjacent landholdings where Yellow-footed Rock-wallabies are known to occur.
- Undertake follow-up studies of aerial baiting and shooting programs to determine the impact of these activities on native species and on animals on neighbouring properties.
- Undertake rabbit control programs including warren ripping where appropriate and as resources permit.
- Allow horses to be used on the park, subject to approval, but limit their stay on the park to the absolute minimum.
- Maintain contributions and involvement with the Dog Fence Board in implementing the Lake Frome Buffer Strategy to reduce Dingo populations.

7 MANAGING FIRE

Although wildfires occur in the Northern Flinders Ranges from time to time, usually the result of lightning strikes, they are not a common occurrence. Such fires normally extinguish themselves of their own accord and do not pose a significant threat to biodiversity. In the context of a region with a historically low frequency of major wildfire events, provided human life or property is not endangered, the fire management strategy for this park in the advent of wildfire will be to take a low-key 'watch and wait' approach.

This strategy is particularly emphasised for the Strict Protection Zone. Elsewhere on the park, access tracks and key water supply points should be maintained, and basic fire-suppression equipment kept in readiness to protect human life and property, and possibly some key environmental sites.

There are no current plans for ecological burning. However, further research may indicate the need for applied fire to enhance biodiversity and this is not ruled out as a future option. The extent and purpose of any Adnyamathanha use of applied fire in earlier times should be thoroughly investigated and relevant, traditional knowledge factored into future management operations. Planned fires, where appropriate and ecologically sustainable, may also be used to reduce fuel hazards with the aim of protecting life and property.

A fire management plan should be prepared for the park to identify the park's key biological and cultural values and built assets. This document will form the basis of ongoing fire management and be reviewed and updated regularly.

Fire management planning will:

- identify natural and cultural heritage values and built assets;
- provide a framework for the management of wildfire suppression, including identification of strategic access and control lines;
- provide a framework for prescribed burning for ecological management and/or fuel reduction purposes; and
- identify performance indicators.

Campfires are currently permitted on the park and are not seen as a problem at this point in time. However, campfires and firewood use should be monitored, and the option retained to limit or ban this activity during the term of this management plan should DEH policy change or observations by the Board indicate that campfires are proving detrimental to the environment. To mitigate some of the negative impacts of campfires, gathering firewood on the park is not permitted and all firewood should be imported.

Objective

A minimal intervention fire management strategy is applied to the park; but one that is consistent with adequately protecting life and property, maintaining biodiversity and protecting natural, cultural and built-asset values.

Strategies

- Develop, implement and review fire management plans in association with CFS and other stakeholders.
- Exclude use of heavy earth-moving equipment and vehicle-based fire suppression tactics from the Strict Protection Zone of the park.
- Maintain fire suppression equipment and water supplies on the park, consistent with perceived risk and the personnel available to operate the equipment. Maintain public roads and access tracks to support any necessary fire management or suppression activities.
- Research Adnyamathanha use of applied fire and investigate and maintain records of the fire history of the Park and surrounding areas. Monitor vegetation composition and structural changes resulting from any wildfire events, and research the environmental requirements for fire as an aide to revegetation.
- Monitor campfires and take whatever steps are necessary to minimise adverse impacts.

8 MANAGING TOURISM AND RECREATION

8.1 Visitor Use

The Vulkathunha-Gammon Ranges National Park is in a remote locality and as a consequence, offers recreational experiences that tend to appeal to the more self-reliant visitor. Travelling and exploring by 4WD vehicle, camping, bushwalking, and appreciating scenery and nature are probably the major activities undertaken.

One of the reasons for creating the park was to secure an area of rugged, arid 'wilderness' that had inspired a group of experienced walkers. More than 30 years later, the ready availability of dependable 4WD vehicles and access to reliable communication systems, permits a broader spectrum of visitors to traverse the park safely although bushwalkers and outdoor-focused groups such as Scouts still remain prominent in the visitor demographic. There are also a number of commercial tour operators who are either based in, or bring tour groups through, the Northern Flinders Ranges and utilise the park's resources.

The remote locality and type of recreational pursuits undertaken by visitors are reflected in the length of average stay. For those visitors who camp in the park, average stay is more than two days. As well as camping, built accommodation (basic cabin-style) is available for rental at Grindell's Hut (sleeps eight), Nudlamutana Hut (sleeps four), and the (former) Balcanoona Shearers' Quarters (which sleeps up to 18).

Apart from bushwalking, the diversity of habitats and special wildlife provides excellent opportunities for nature study, while the geological variety and complexity of the region encourages visitors to seek a better understanding of geomorphology and mountain building processes. The park also provides a rich array of cultural and historic themes including exploration, arid-land pastoralism, mining and Aboriginal culture including art sites. Given an increasing community interest in Indigenous culture, and the ongoing involvement of the traditional Adnyamathanha owners in the management of the park through their representation on the Board, the cultural tourism aspect is likely to gain prominence.

The pattern of visitor use has changed over the years. Prior to the initial dedication in 1970 and in the years immediately following, the Gammon Ranges was very much an area for a few self-sufficient bushwalkers and the occasional vehicle-based camper. However, following dedication of the Balcanoona lease in 1982, the park became more accessible to a wider range of visitors and numbers started to increase. By 1985, concerns were being expressed about the impact of visitors on the park's resources, but in subsequent years, the number of visitors to the park declined.

While visitor information data for many years is lacking, more recent surveys indicate that total visitor numbers have risen quite substantially, from 4,600 in 1993 to approximately 18,000 visitors in 2000/01 and 16,000 in 2001/02. The reasons for year to year variations in visitor numbers are complex. Factors influencing a travel decision could include the current economic situation (eg fuel prices), prevailing weather patterns, media exposure, promotion of other reserves as alternative destinations, and marketing of the Flinders Ranges by state and regional tourism bodies. It is known, for instance, that during 2000/01 floodwaters in Lake Eyre boosted visitor numbers to the whole outback region.

Those most recent surveys confirm too, that over the course of a typical year, monthly visitor numbers vary quite markedly. Highest visitor rates occur during the late winter/spring (July to October). There is a smaller peak in autumn (April to May) that probably coincides with school holidays and Easter. People tend to avoid visiting the Flinders Ranges during the heat of summer.

In a report prepared for DEH, Market Equity (2002) analysed the results of various surveys and questionnaires for the years 2001-2002. Salient points from that report are:

- mature persons (26-65 years of age) are more likely to visit the park;
- male visitors (55%) outnumber females;
- the majority of visitors (52% compared with only 25% for all other state parks) were from interstate, 26% were from metropolitan South Australia (compared with 44% for all other state parks), while 15% were from regional South Australia (compared with 23% for all other parks);
- 7% of visitors came from overseas and interestingly, 65% of respondents claimed to have been accompanied by overseas visitors;

- average party size was 3.6 persons;
- most parties (80%) travelled in 4WD vehicles, or by car (19%) – only 2% travelled by other means;
- 31% of those surveyed cited 'active recreation' as the reason for visiting the park, followed by 'sightseeing' (28%) and 'relaxation' (15%) and were statistically more likely to be environmentally focussed;
- viewing landscape (82% of visitors), walking (76%), viewing plants and wildlife (74%), camping (74%), 4WD driving (59%), and photography (56%), were the most popular activities undertaken;
- most visitors (83%) stayed overnight and the average length of visit was somewhat over 56 hours, indicating that the majority of visitors would have spent at least two nights in the park;
- 96% of visitors said they would return, or recommend the park to others – the few who wouldn't cited the 'park condition', remote locality, the state of the roads and lack of facilities as deterrents; and
- almost all visitors had researched the park prior to their trip, utilising tourist guidebooks, the Park brochure, park offices and a wide range of other information outlets, including the RAA (particularly for South Australians) and Regional Tourist Centres (in the case of interstate and overseas visitors).

Overall, the majority of those visitors surveyed by Market Equity (2002) expressed strong satisfaction with their overall park visit, park cleanliness and activities available, but were least satisfied with the current state of signs and roads. Park trails, cleanliness, and camping sites were identified as the most important facilities/attributes for visitors to the park, indicating that camping facilities, park roads, and walking trails would be key improvement areas.

Those surveyed also suggested the park could do with better toilets, clearer information signs (to include such things as distances, maps, and flora and fauna information) and better roads. However, surveyed visitors, particularly those who had visited the park previously, were adamant that DEH should avoid 'further development'. It is important for park management that comparable records of visitor numbers and opinions continue to be gathered in the future. A waste management strategy that caters for expected visitor use patterns should be developed and implemented.

Probably the most significant point to highlight from the above statistics, is the very high percentage of interstate visitors, which would tend to indicate that recent tourism marketing has been successful. It would appear that the Flinders Ranges are now recognised (at least within Australia) as an interesting and aesthetically attractive piece of the Australian 'outback' that is (relatively) close to civilisation and accessible to visitors. What is more, many Australians are bringing their overseas friends and relatives to the park and this should be factored into visitor information material and future promotional activity.

Other types of recreational activities that are currently undertaken or might be contemplated, and their desirability, include the following:

- Rock climbing is not considered an appropriate activity in this park, the public risk factor being very high, given the nature of the rocks and the remoteness of the area. Rock climbing will not be permitted during the term of this plan and no rock climbing areas will be formally designated;
- Horse riding is permitted on public roads and this activity may be permitted on designated tracks, subject to approval. Indigenous tour operators may be allowed to take horses onto the park, provided they comply with DEH commercial tour operator policy and hold the appropriate operators' licence;
- Caving is not considered an appropriate activity. The only significant cave, Wooltana Cave, is the home to a population of bats and the public is excluded to ensure these animals remain undisturbed. Caving will not be permitted within the term of this plan, except with written approval from the Board; and
- Bicycle riding is permitted on public roads, and may be permitted on designated tracks subject to approval (noting however, that this activity is not permitted on walking trails). Given

an increase in interest in bicycle touring, a strategy to deal with this use should be developed in collaboration with Bike SA.

Objective

A culturally appropriate and environmentally sustainable range of recreational opportunities is provided for visitors to the park, with both day-visit and over-night facilities that contribute to an enjoyable experience without compromising the park's environmental or cultural values.

Strategies

- Support initiatives by Adnyamathanha traditional owners in cultural interpretation and tourism.
- Continue present maintenance regime and investigate options for the future development of improved visitor facilities (including overflow camping areas) and access to same for park visitors, based on visitor demand and subject to overall park management objectives, available resources and statewide priorities.
- Give emphasis to the Balcanoona Park Headquarters, various historic and cultural day visit sites and associated car parks and access tracks as visitor foci, with well designed management constructions (facilities, infrastructure, barriers, paths, rails and signs etc) that can withstand the impacts, protect values and assist in providing interpretive information.
- Maintain and improve the park information, walker registration and camping permit system that currently operates, with the proviso that visitors remain primarily responsible for their own safety.
- Visitor statistical records are compiled to assist in planning visitor facilities, with visitor numbers and opinions being regularly monitored and vehicle-counting equipment maintained to better understand visitor needs and the flow of traffic.
- Limited bicycle and horse riding may be allowed in the park, subject to codes of conduct and within a management framework that places strict limits on where these activities take place.
- Establish and maintain liaison with user groups and event organisers, and develop and implement appropriate codes of conduct. In association with Bike SA, develop a bicycle use and access strategy for the park.

8.2 Visitor Access

Walking Trails

Bushwalking is almost synonymous with the Vulkathunha-Gammon Ranges National Park and some of the deep gorges have proved attractive to walkers. There are few formed walking trails in the park and for the most part, bushwalkers must find their own way. While navigation is generally easy through the very open light scrub or along the dry watercourses, pedestrian travel is often rough, as routes tend to follow rocky creek beds or have much tough scrub to negotiate.

Water availability can be a problem and although there are some recognised waterholes, these are sometimes dry and drinking water must then be backpacked. Walking trails have been marked in the Conservation Zone of the park, for example between Italowie Gorge and Grindell's Hut and elsewhere.

The park is a remote and rugged environment and accidents and misadventures can happen, even within the best-organised groups. For safety and risk management reasons, visitors planning a trek are encouraged to submit a trip intentions form at the Balcanoona Park Headquarters before they set out. While DEH maintains this walker registration system and takes due care for walker safety and welfare, it remains a walker's responsibility to ensure his or her own survival.

Visitors come to this particular park to enjoy a 'wilderness' bushwalking experience. It is axiomatic that encountering large numbers of other walkers could well detract from that experience. For that reason, a visitor-use strategy will be developed for and applied to the Strict Protection Zone that preserves 'wilderness' qualities and experiences. The Board reserves the right to limit the number of walkers using the Strict Protection Zone at any one time. The numbers of walkers and locations visited will be regularly monitored and any controls deemed necessary put in place.

Vehicle Access

Although there is a sealed airstrip, with the exception of specially arranged aircraft flights into the area and coach access to neighbouring Arkaroola Wilderness Sanctuary, visitors normally require private road transport to get to the Gammon Ranges and to access areas within the park.

The Idnina to Loch Ness track 'loop road' is now one-way traffic but the network of roads and tracks in the park still needs further rationalising to meet the requirements of the zoning prescription. Some minor re-alignments are still required and some tracks may need to be closed. Other tracks, after upgrading, could be opened to visitor access.

Wherever practicable, public roads and certain designated access tracks will be upgraded and maintained to 2WD standard, however economic constraints and topography may result in some tracks remaining suitable only for 4WD use during the life of this plan. Throughout the park, tracks will be assessed. Where they serve no useful, ongoing purpose or are in conflict with the zoning prescription, they may be closed to public and service vehicles, while others may need to be upgraded and opened. From time to time for cultural or management purposes, vehicles may be permitted to access other parts of the park.

Objectives

Walking trails are integrated with regional trail networks and a range of walking opportunities are provided within the park, allowing visitors to explore the natural and cultural assets of the reserve, but without adversely impacting on culturally or environmentally sensitive areas.

Walking trails/routes cater for a range of interest and fitness levels, always accepting that the park landscape lends itself to the provision of challenging and difficult walks for experienced and well equipped persons and the 'wilderness' qualities of the park and associated walking experiences are retained.

Appropriate and environmentally sustainable vehicular access is maintained within the park for the visiting public, management purposes and emergency use.

Strategies

- No walking trails should be constructed, marked or maintained within the Strict Protection Zone of the park. Management actions that result in a visual intrusion will only be considered for public safety reasons and where the alternative of doing nothing could result in a significant public risk.
- The numbers of walkers and places visited will be regularly monitored and any controls on access considered necessary for cultural or environmental reasons put in place. Special attention will be given to the Strict Protection Zone in this regard.
- Maintain the walker registration system, but with the proviso that responsibility remains with intending walkers to make all necessary arrangements for the appropriate authorities to be notified if they are overdue.
- Maintain bushwalking information signs, containing useful information relating to the walking time required, degree of difficulty, equipment and permits required, water sources and a reminder for overnight walkers to register.
- Maintain self-guided walking tracks of comparatively short duration and degree of difficulty from car park trailheads at selected localities.
- Maintain liaison with the South Australian Tourism Commission, Department of Recreation and Sport and various community groups representing bushwalkers.
- The Board to assess all tracks and close, open or re-route them to comply with the zoning prescriptions outlined in this plan of management and to best meet cultural and environmental objectives. The Board may temporarily close off public access in wet weather to prevent additional track damage occurring or for cultural or environmental reasons.
- Establish a track and trail rationalisation/maintenance program to provide clearly defined routes for visitors while eliminating duplication and reducing impacts on park values.
- Consult with neighbours and other agencies (eg Transport SA) concerning vehicle access and road management, ensuring that road construction works are remediated by the

appropriate authority. Follow notification process outlined in ILUA for earthworks where required.

8.3 Visitor Facilities

Camping

The proclamation of the Balcanoona additions in 1982 resulted in significantly more campers in the park, and in only a few years, the impacts were starting to show. However, following a subsequent period of above average rainfall, some campsites that had appeared to be under pressure in 1985 showed no significant evidence, ten years later, of that previous intense use.

To better manage the impacts of this activity camping areas were developed at Grindell's Hut, Weetootla, Italowie and Arcoona. Vehicle-based camping is focussed at those sites and there are public amenities at Balcanoona Headquarters. Car camping also takes place at Mainwater Well. In the more remote parts of the park, only backpackers travelling on foot are permitted to camp overnight. Both campers and walkers are encouraged to 'take in/take out' when it comes to their rubbish.

The option is retained to develop additional camping areas within the term of this management plan (including overflow camping areas to be opened in busy periods) subject to demand and in compliance with the zoning provisions. A visitor numbers and camping capacity review should be a precursor. Any built development or on-ground works will need to comply with the notification process outlined in the ILUA.

Currently, only camping fees apply in the park but the option of charging a fee for vehicle entry may be considered and implemented during the term of this plan.

Campfires have been discussed previously in Section 7 Managing Fire.

Objectives

Overnight cabin-style accommodation for visitors is provided at locations and in buildings that are suitable for the purpose, and at the Balcanoona Park Headquarters site.

Vehicle-based bush camping is catered for in a number of locations within the Visitor Use Zone of the park, but only bushwalker camping is permitted within the Strict Protection and Conservation Zones of the park.

Strategies

- Maintain the existing car-camping areas and investigate requirement for additional sites, subject to the zoning provisions in this management plan and comply with the notification process included in the ILUA.
- Permit bushwalkers (only) to camp overnight within the Strict Protection and Conservation Zones of the park and review all camp sites.
- Continue to repair and restore accommodation structures within the park as resources permit. Maintain the historic fabric of those structures nominated for conservation.
- Develop and maintain day-visitor areas at Grindell's Hut, Weetootla, Italowie and Arcoona as well as at Balcanoona.

8.4 Commercial Tourism

Private tour operators undertaking commercial activities within the Vulkathunha-Gammon Ranges National Park are required to hold a Commercial Licence, pursuant to the *National Parks and Wildlife Act 1972*. More than 65 commercial tour operators already hold Commercial Licences allowing them to bring groups of paying clients to the park, although only a few currently do so (2006). Licence fees are paid into the General Reserves Trust and are used to improve visitor services and facilities within reserves.

With the vigorous tourism marketing strategy for the Flinders Ranges and the increased emphasis on nature-based and cultural tourism in the region, there may be other tour operators who would like to incorporate aspects of the park into their itineraries. It is an area where Aboriginal people have demonstrated entrepreneurial initiative and are to be encouraged.

The Board will have a key role in reviewing commercial tour proposals and issuing licences. In addition, certain commercial tourism proposals (ie those that apply only to the park or those that permit the interpretation of Aboriginal culture on the park) will be subject to the notification process outlined in the ILUA. Proposals most likely to be approved would be those that focus on the park's environmental and cultural values, and can demonstrate strong linkages to the tourism theme adopted for the region. All commercial tour activities should be consistent with park and property management objectives. They should not conflict with natural or cultural values, impede park management operations or interfere with other visitors. It has been noted elsewhere in this plan that Arkaroola Air Service P/L manage the park airstrip and use this facility for commercial tourism.

Access to sites and the dissemination of Indigenous cultural information is a particularly sensitive area that requires the concurrence of the traditional owners. Tour group operators need to be appropriately accredited and training opportunities may be arranged by the Board. The Board may require that commercial tour groups utilise the services of an Aboriginal guide if they wish to access areas of cultural sensitivity.

Suitable and viable proposals consistent with this management plan may be approved for license arrangements and preference will be given to Aboriginal enterprises. In this context, horse riding tours may be permitted on designated tracks subject to approval and Indigenous tour operators may be allowed to take horses onto the park, provided they comply with DEH commercial tour operator policy and hold the appropriate commercial licence.

Objective

Ensure any commercial tourism undertaken on the park has minimal impact on the natural and cultural values of the park, is approved only after proper notification as required under the ILUA and makes an appropriate financial contribution to management.

Strategies

- Review existing commercial visitor service operations and consider additional requests to allow private sector and other parties to undertake commercial tourism ventures on the park. Issue Commercial Licences under section 35(3) of the *National Parks and Wildlife Act 1972* for appropriate use of the park by tour operators, if their activities are consistent with the objectives of this management plan and are culturally appropriate, subject to notification if required under the ILUA.
- Encourage Adnyamathanha people to become involved with commercial tourism and to conduct guided tours of places of historic and cultural interest including culturally sensitive areas (when and where appropriate).

8.5 Information and Interpretation

Information provided for visitors should enhance their visit to the park by raising their awareness, and encouraging an appreciation and behaviour protective of park values. Intending park visitors expect to find adequate signs, maps, brochures and other information sources and these should be provided, even if the Park Headquarters at Balcanoona is not always staffed. All visitor information and interpretive material should be consistent with DEH standards, sensitive to cultural considerations and reflect the overarching tourism theme for the Flinders Ranges.

The Balcanoona pastoral precinct will continue to be important for the provision of interpretive information for visitors. An interpretation plan for this area was commenced some years ago and should be reviewed and implemented as a component of the visitor facilities plan for the park. Elsewhere in the park, road and direction signs have been upgraded and information/interpretation 'shelters' have been erected at a number of localities. These facilities should be subject to regular review and maintenance. There may be merit in signposting the airstrip to welcome visitors to the region and make them aware they are in the Vulkathunha-Gammon Ranges National Park, even if they are bound for other destinations.

Signposting and information material should incorporate traditional Adnyamathanha place names where this is culturally acceptable. It may be appropriate to include phonetic spelling on signs and brochures to assist non-indigenous visitors with Adnyamathanha names. Deciding on the correct traditional names for localities is the subject of on-going investigation in collaboration with the traditional owners. The Board has a key role in progressing this matter and the reports by Tunbridge (1984/85) and information on Adnyamathanha place names supplied by GS Coulthard in a submission to the draft plan will be a useful source of reference. The spelling of names will be determined in consultation with the Adnyamathanha community.

The reasons for any restrictions on public access need to be explained to visitors. Involvement of Aboriginal guides with tour groups is an option that should be supported, especially in relation to visitors accessing sensitive areas and receiving correct and culturally appropriate information.

Objective

Visitors to the park are able to obtain comprehensive and culturally appropriate information, enabling them to enjoy their time in the park in a safe and responsible way.

Strategies

- Key tourism messages to be promoted will be developed in consultation with the Adnyamathanha community, Northern Region Development Board, the South Australian Tourism Commission, and other agencies.
- Incorporate key tourism messages into visitor programs and information, and provide pre-visit information about the park from suitable outlets, as well as liaising with regional tourist authorities and the South Australian Tourism Commission.
- Incorporate Adnyamathanha place names into information material and signposting.
- Support initiatives by the Adnyamathanha traditional owners in cultural interpretation and associated tourism ventures.

9 MANAGING RESOURCE USE

9.1 Management Infrastructure

For over 100 years prior to reserve proclamation, the land that is now park was used for sheep grazing. With the change in landuse, some of the buildings and infrastructure used for pastoralism were no longer required. Over the intervening decades, some of these items have either been removed or relocated while alternative uses have been found for others. Substantial built assets still remain on the park as a legacy of its former role; eg the Balcanoona homestead and associated buildings, various out-station huts and tanks, troughs, pipelines, fences and stockyards that were all vital to the property's former pastoral function. Some of these have practical, historic or interpretive value, but without adequate maintenance, they can deteriorate and become liabilities.

The park includes a number of significant built assets. In particular, the Balcanoona Park Headquarters area incorporates the old station buildings (of heritage value), staff residences and visitor facilities. A visitor facilities plan has been prepared for this area but requires updating for actioning. That upgrading and restoration work should be completed. Huts at Grindell's and Nudlamutana, together with the old Balcanoona shearer's quarters, have historic connections and currently provide built accommodation for visitors. Restoration work has continued on old buildings at Oocaboolina and Idnina and there are a number of other localities with built assets that should be stabilised/maintained for their historic associations.

The Balcanoona airstrip was substantially upgraded in 1998 and now is the Royal Flying Doctor airstrip for the region. This facility is licensed to Arkaroola Air Service P/L.

Waste management is always a vexed issue for park managers and is not helped in this case by the park's remote location. A landfill operation services the Park Headquarters, but elsewhere visitors are required to 'take out what they took in'. It is proposed that a waste management strategy be developed and applied.

To provide power, a hybrid solar generator has been recently installed at Balcanoona. The existing water supply (ie bores/wells at Balcanoona and other water points) require regular maintenance.

While much of the boundary fencing has been upgraded, a section with Yankaninna Pastoral Lease has still to be upgraded to prevent incursion of grazing stock. By so doing, the boundary fence will be of reasonable standard for its entire length.

How the park is managed in the future is still evolving and some of its built assets will be needed, while others will not. For example, wildlife management programs may or may not be best served with the existing internal fencing arrangements. Again, areas of existing native vegetation habitat or revegetation may need new fencing erected to better protect them. Some of the pre-existing wells should be maintained as water sources while new structures and infrastructure may be needed to cater for biodiversity conservation or visitor requirements. Any new built development will be subject to the notification process outlined in the ILUA where applicable. Notification is not required if the proposed activities are entirely contained within the location of existing works or infrastructure.

While it is not possible to be specific in this management plan, an inventory of existing assets should be a precursor to an evaluation of future needs and requirements and before any decision is taken to remove buildings or structures. This inventory should form the core of an asset management plan. Once that document has been prepared, an asset maintenance program should be drawn up and implemented on an annual basis.

Objectives

The park has appropriate built assets and infrastructure for its role as a national park, subject to an ongoing maintenance program, while power, water and waste are managed in a cost effective and environmentally sensitive manner.

Buildings and structures relating to the pastoral era and associated historic buildings are conserved (where appropriate) and maintained in such a way that their historic integrity is respected.

Strategies

- Conduct an inventory of existing infrastructure and built assets and compile a long-term asset management plan for the park; regularly update this plan and budget for an annual asset maintenance program.
- Compile a comprehensive visitor facilities plan for the park. As a first step in implementing this plan, complete the upgrading of the Balcanoona Headquarters precinct and undertake stabilisation/conservation work on other buildings and structures elsewhere in the park that are considered to be of historic significance.
- Maintain water supplies considered necessary for visitor use and firefighting.
- Develop and implement an effective waste management strategy.

9.2 Exploration and Mining

The Gammon Ranges have had a long history of mining activity, particularly gold prospecting, copper mining and smelting, some of which took place on what is now park. Any old mine workings that are considered to be of heritage value need to be kept in a safe and stable condition. Otherwise, site remediation and restoration of the environment would be desirable.

The 1982 'Balcanoona' additions to the park were proclaimed with provision for mining access. This was because BHP Pty Ltd held pre-existing leases to some substantial magnesite deposits and some years prior, had excavated a number of test adits in Weetootla Gorge near Balcanoona Creek. However, the 1984 proclamation of the 'Plains Block', despite the presence of the Moomba gas pipeline, did not include any provision for mining, despite pipelines being subject to mining legislation.

The BHP magnesite-mining leases were due to expire in 2001. As BHP had no intention (for environmental reasons) of utilising the magnesite resource, another mining company sought to purchase these rights with the intention of undertaking extractive operations. The application for lease transfer and the prospect of mining activity occurring in the park generated significant public debate. The transfer of ownership of the mining leases required the Environment Minister's consent, which was refused on the grounds of protecting species of conservation significance (including the Yellow-footed Rock-wallaby and the Purple-spotted Gudgeon) and for general environmental protection.

The mining leases eventually expired and all exploration and mining rights in the park were repealed in a variation to the park proclamation (Gazette 25 July 2002 p2930).

Transport SA maintains the public road network through the park and in the past, borrow pits were established to mine road-building material. It is preferable if the park were not the source of such material. Ideally, no new borrow pits should be developed and any existing pits should be closed and rehabilitated by Transport SA to the satisfaction of the Board. All road maintenance work and location of borrow pits will be subject to the notification process outlined in the ILUA where applicable. To this end, liaison should be maintained between Transport SA and the Board in regard to the public roads and road maintenance activities, and any disturbance kept to a minimum.

The Moomba Gas pipeline easement crosses the 'Plains Block' and is mining infrastructure that pre-dates reserve proclamation. Access along the pipeline easement by mining companies and their contractors, other than those whose activities are directly related to the Beverly Mine or the use and maintenance of the pipeline facility, requires the approval of DEH. The operators of the Beverly Uranium Mine (located on land on the eastern boundary of the park) also use this access route. Those activities are not currently seen as problematical, but liaison should be maintained with the pipeline operators, miners, contractors and government agency personnel who monitor compliance.

Objective

The mining history of the park is interpreted for visitors and any heritage mine sites kept in a safe and stable condition, but otherwise, areas of past mining activity are restored to a more natural condition.

Strategies

- Research information on mining history as a component of visitor information and interpretation.
- Any former mine sites are either restored to more natural condition, or if retained for their heritage value, kept in a safe and stable condition.
- Maintain effective liaison with proponents of mineral exploration and extraction activities on adjoining land and with Transport SA regarding borrow pits.

9.3 Public Utilities

Radio network and telecommunications facilities are located in the park (eg there is a radiophone facility and tower located near Balcanoona). That unit is sited in the vicinity of a development precinct and it does not pose any visual or environmental problems. On balance, there is public benefit in terms of risk management in having such communication facilities located on park. There is the likelihood however, that sometime in the future, requests will be made to locate additional utility services on the park. It is impossible to canvas the range of hypothetical possibilities in this management plan, but an example might be an additional telecommunications tower.

In general terms, DEH policy is opposed to the location of utility infrastructure on reserves except under very special circumstances. Protection of park values should be the first priority and reserves should not be taken as an easy option because they are public land and (usually) remote from residential areas. However, a major consideration in this remote region is human safety and risk management. Without knowing the specifics of any future proposal for new infrastructure, it should first be reviewed against the current departmental policy. Provided that it complies with DEH policy and is in accord with the spirit and intent of this management plan, grant of approval may be given, subject where applicable to compliance with the notification process outlined in the ILUA.

While an unlikely prospect in this park, there is a possibility that careless park maintenance work could damage existing utility services. It is more likely that insensitive maintenance work or other actions undertaken by road builders or utility authorities could inadvertently impact on environmental or cultural assets interfere with park management activities. To avoid problems in this area, the Board need to maintain effective liaison, particularly Transport SA and Telstra, to ensure that maintenance, development works and/or road management decisions do not interfere with or impact on the environmental and cultural values or operational aspects of the park and that all works comply with the notification process set out in the ILUA where applicable.

Objective

All necessary steps are taken to ensure the location, operation and maintenance of road access and utility services either external to, or within the park, do not compromise environmental or cultural values and the notification process set out in the ILUA is carried out, where applicable.

Strategies

- Maintain accurate records of any utility services, to minimise the likelihood of inadvertent damage as a result of park maintenance or development works.
- Maintain liaison with utility authorities and periodically review access requirements, maintenance programs and future plans.
- Review any proposal for the location of additional utilities on or over the park against the objectives of this management plan, current DEH policy and in consultation with the Adnyamathanha traditional owners, complying with the notification process set out in the ILUA where applicable.

9.4 Leases and Licences

In addition to the transient commercial tourism and outdoor recreation related enterprises referred to in Section 8.4 Commercial Tourism, approval is sometimes sought by private sector parties to undertake other forms of commercial activity or development on reserves. For example, requests to undertake commercial filming in national parks are quite a common occurrence. The provision of visitor services and facilities is another area where private sector involvement is not unusual in national park situations.

There may be a future role for the private sector in supporting some of the proposals and activities referred to in this plan. For example, private sector involvement in the maintenance and day to day operation of camping sites or built visitor accommodation is an option that should be explored and would require more secure tenure and a longer-term lease or leases over land or buildings. There are currently three third-party leases/licences over park land (2006). By such arrangements Arkaroola Air Service P/L manages the Balcanoona airstrip (expires 2020). Heathgate Resources P/L has rights of access to a road across the park (expires 2020) and the Natural Gas Authority of SA has access rights to the gas pipeline that crosses the Plains Block (expires 2016).

Opportunities may arise during the term of this plan when it may be appropriate to issue licences or enter into leases to allow third parties to operate on-park. Such commercial arrangements should only be contemplated if it can be demonstrated that cost-effectiveness and better management will result, and there will be no detriment to the natural, cultural and heritage values of the park.

Approval for any such (unspecified) commercial proposals would be subject to their meeting all planning and legal requirements and not compromising the values or management of the park or interfering with legitimate visitor use. They would need to demonstrate acceptable environmental, recreational, cultural and aesthetic impacts. The Board will have a key role in reviewing any filming proposals or commercial enterprise involving the granting of a lease or licence under section 35 of the *National Parks and Wildlife Act 1972*. The notification process as set out in the ILUA should be carried out where applicable. Issue of permits under the *National Parks and Wildlife National Park Regulations 2001* is also the responsibility of the Board.

Objective

Any commercial leases or licences on the park are entered into and operated under strict conditions and within a management framework that respects park values, are consistent with the objectives of this plan of management, and are mutually beneficial to all parties.

Strategies

- Explore alternatives for out-sourcing visitor facility management and assess any other leasing/licensing proposals. If and when approved, set lease/licence terms and conditions and monitor compliance, ensuring operations are consistent with the natural, cultural and heritage values of the park, subject to the notification process set out in the ILUA where applicable.
- Maintain ongoing liaison with Arkaroola management as to airstrip operation; similarly maintain effective working relationships with Heathgate Resources and the Natural Gas Authority of SA and any other (potential) lessees/licensees.

10 INVOLVING THE COMMUNITY

The Board and DEH recognise the substantial contribution to reserve management made by the community, recreational and volunteer organisations and will continue to provide support and assistance, where possible, to volunteer groups involving themselves in appropriate aspects of park operations as volunteers require materials, equipment and oversight by park staff. Therefore, it is important for the Board to maintain liaison with any volunteers to provide support and encouragement, and to ensure their efforts are consistent with park management objectives and work programs. Volunteers include Friends groups, Hunting and Conservation Branch of SSAA, and Conservation Volunteers Australia; work teams sourced under other arrangements include Correctional Services MOW Camps and Green Corps.

In terms of regional biodiversity conservation, 'Operation Bounceback' has established companion projects and partnerships with Arkaroola, the former Northern Flinders Ranges Soil Conservation Board³, Hunting and Conservation Branch of SSAA, Adnyamathanha Aboriginal Community, Green Corps, Australian Trust for Conservation Volunteers, Nature Conservation Society of SA and the Scientific Expedition Group. These and other community and recreational-user groups can make a valuable contribution towards achieving the objectives of this plan. However, it is important that the Board engage with them and set direction to avoid conflict and discouragement.

The Outback Consultative Committee provides the Minister with a mechanism for obtaining public input into reserve management. There is also a Friends of Vulkathunha-Gammon Ranges National Park group and previously a Grindell's Hut Friends group undertook some building restoration works.

The Royal Geographic Society has been active in establishing walking trails and installing location markers. The Hunting and Conservation Branch of SSAA continues to undertake feral goat control activities several times each year, and these are combined with night hunts for foxes and cats. The Board should develop and maintain effective, on-going liaisons with the groups who have a special interest in the park.

A range of research partnerships has also been developed with Primary Industries and Resources SA, universities and TAFE groups. The park has been a significant beneficiary of some of these activities. Indeed, cooperation in feral animal control programs has been the major unifying influence in the relationship between the park and its neighbours.

Developing and maintaining an integrated, regional approach to management is the current strategy being pursued. For the term of this management plan, developing and maintaining cooperative management arrangements with the owners or managers of nearby land is considered essential to achieve that integrated approach. There are obvious benefits in participating in regional land management programs and contributing to community organisations and boards including the South Australian Arid Lands Natural Resources Management Board, Landcare groups, and other regional authorities. The *NatureLinks* initiative is a government program to conserve species and habitats in partnership with the community. The park will form an important component of the Flinders and Olary *NatureLinks* corridor.

Objectives

Opportunities are taken to develop and maintain partnerships between State and Local Government agencies, non-government organisations and neighbouring land managers in the management of the park.

The involvement of the broader community, volunteer organisations, recreational user groups and interested individuals in the development of park management programs, in collaboration with the Board and through ATLA, the Adnyamathanha traditional owners, is encouraged and supported.

Strategies

- To help integrate the park's biodiversity and recreation management with that of the Northern Flinders Ranges, encourage the development of and contribute to partnership arrangements

³ The South Australian Arid Lands Natural Resources Management Board has overarching responsibility for operations formerly undertaken by the Northern Flinders Ranges Soil Conservation Board.

with regional boards, recreational user groups and other relevant organisations and individuals that have an interest in the sustainable management of the region.

- Encourage the involvement of universities and other institutions in research and volunteer programs.

11 MANAGING LAND TENURE

Additional Land

Reserve proclamation and direct control of land management by a public authority is still considered, by many, to be the most prudent option to achieve effective biodiversity conservation and protection of heritage sites, and from time to time proposals are made to increase the area of the park. However, developing cooperative management arrangements with the owners/managers of surrounding land can also be a cost-effective way to achieve strategic conservation objectives and good environmental outcomes without a large capital outlay. The benefits of collaborating with park neighbours on regional initiatives have been discussed elsewhere in this management plan.

The present park area will continue to be managed as a national park in accordance with this plan of management and any future plan amendments/substitutions, the ILUA and the CMA. So while there are no current proposals to enlarge the park, circumstances could arise in the future where it may become desirable to acquire more land for reservation and further land additions are not ruled out. The Board and DEH will assess any additions proposed for the park.

Any land formally proclaimed as an addition to the park would become subject to, and then be managed in accordance with this and future management plans. Changes to the ILUA and CMA would need to be negotiated to include the additional land.

Objectives

Optimum conservation, cultural and recreation outcomes are achieved by collaborating with neighbours and integrating the management of the park with the management of other, nearby land.

In circumstances where reserve status is the best option, ie: where this would significantly enhance conservation, or improve the management of the land already incorporated in the reserve system, suitable land is acquired and proclaimed as additional to the park.

Strategies

- Support any complementary regional initiatives and develop and maintain cooperative management arrangements with the managers of adjoining land to achieve conservation, cultural and recreational outcomes that accord with the objectives in this plan.
- Investigate all opportunities to conserve land to improve park values and consolidate park boundaries.
- Manage all land additions to the park according to the principles outlined in this management plan and in accordance with the ILUA and CMA.

SUMMARY OF MANAGEMENT STRATEGIES

STRATEGY
PARTNERSHIP WITH ADNYAMATHANHA
DEH staff work closely with the Adnyamathanha traditional owners to achieve effective and appropriate management of the park and the preservation of Indigenous cultural heritage.
Move towards a co-management agreement and a co-management board with the Adnyamathanha traditional owners to among other things, implement this management plan.
Integrate traditional land management knowledge with contemporary science by providing employment opportunities to the Adnyamathanha traditional owners.
MANAGING CULTURAL HERITAGE
With guidance from the Adnyamathanha traditional owners and in consultation with DAARE, DEH Heritage Branch and other relevant authorities encourage and support research that may help to identify and protect stories, known or relocated sites and objects of archaeological, anthropological, cultural and historical significance located in the park.
Develop interpretive material and tourism programs for visitors and where appropriate, present individual cultural heritage sites for public access. Utilise the Balcanoona precinct as an interpretive location, using the buildings, yards and other pastoral infrastructure located there (and at other sites) for explaining the pastoral and cultural history and other aspects of the park to visitors.
Consult the Adnyamathanha traditional owners and relevant Aboriginal heritage authorities, in decisions regarding the management of Indigenous cultural heritage.
Undertake a cultural heritage survey before proceeding with any significant on-ground works within the park. Develop and implement an agreed protocol for such surveys with the Adnyamathanha traditional owners and relevant Adnyamathanha organisations.
ZONING
Designate the uses and implement management of the park according to the zoning prescriptions outlined in this management plan.
MANAGING NATURAL HERITAGE
Geology, Soils and Landform
Take account of Adnyamathanha spiritual and cultural values when planning for future landuse or visitor access, or when undertaking management activities and development works that might impact on rocks, soils or landforms. Permit public access only in designated areas and on designated tracks/trails; restrict access to sensitive areas by zoning exclusions and by erecting appropriate barriers.
Identify specific areas of the park where soils are degraded, or susceptible to degradation, and would benefit from preventative/remedial management strategies and implement appropriate programs of rehabilitation when and where necessary, setting up photopoints, exclusion plots or transects to monitor erosion control programs and erosion sites of concern.
Assess soil types and properties, particularly erosion potential, when planning for future land use or visitor access, incorporating appropriate design features into park developments to minimise soil erosion and reduce the risk of accelerating the soil erosion process.
Gather information and data on places of cultural and spiritual significance (if appropriate) and the geological and geomorphological processes operating in the park to assist in park management, providing information signs and interpretive material to make visitors more aware and encourage them to use designated routes and avoid erosion-prone areas.
Maintain liaison and work cooperatively with the South Australian Arid Lands Natural Resources Management Board.

STRATEGY
Hydrology
Take into account the Adnyamathanha spiritual and cultural values of springs, waterholes and watercourses when planning for future landuse or visitor access, or when undertaking management activities and development works.
Participate in regional management programs, in partnership with relevant authorities, in support of management schemes designed to minimise negative impacts to groundwater reserves.
Manage on-park (and collaborate with neighbours regarding any off-park) hydrological activities, minimising any adverse impacts to the creek systems or groundwater assets of the Park, and undertake remedial works when and where necessary and feasible.
Document any changes to aquatic ecosystems following changes in park management (eg since the cessation of stock grazing) reductions in feral animal numbers or in overall grazing pressure.
Encourage and support the ongoing involvement of research institutions and interested volunteers in the monitoring of rainfall, water quality, ecological processes and associated management programs.
Native Vegetation
Continue with projects designed to enhance biodiversity and restore ecosystems including, when and where necessary, the regulation of total grazing pressure.
Comprehensively monitor vegetation community changes; particularly in those areas known to have had significant understorey change in the past, where management effort has been applied, or conversely, where regeneration of canopy species appears absent.
Monitor the stability and manage threats in those areas that contain plant species that are listed as threatened or of biogeographical significance.
Take the advice of the Adnyamathanha into consideration when taking decisions on scientific research involving native plants and record and incorporate relevant Indigenous knowledge as it pertains to vegetation management.
Native Fauna
Continue monitoring of the numbers of large macropods and Yellow-footed Rock-wallabies and undertake biodiversity conservation projects in association with ecological recovery programs. Prepare and implement additional wildlife management and recovery plans as necessary.
As part of a regional ecological restoration program the reintroduction of fauna species that formerly occurred in the park could be considered, subject to ongoing threat abatement works. Species to be considered will be discussed with Adnyamathanha traditional owners.
Identify and protect significant fauna habitats and integrate habitat restoration with revegetation efforts and introduced plant management programs. Monitor and manage the impacts of abundant native species and address the causes of artificially elevated population levels. If necessary, undertake culling of over-abundant native species (viz Red Kangaroos and Euros).
Take the advice of the Adnyamathanha into consideration when taking decisions on scientific research and projects involving native animals and record and incorporate appropriate Indigenous knowledge into fauna management policies and procedures.
Allow hunting of Adnyamathanha game animals in the Cultural Use Zone in accordance with the provisions of this management plan. Prepare and implement a wildlife management strategy that will help ensure the long-term, sustainable Adnyamathanha harvesting of Red Kangaroos and Emus.
Encourage approved volunteer groups and individuals including Adnyamathanha people to conduct fauna surveys and undertake population monitoring. Encourage surveys for fauna species not recorded from the park and determine the habitat requirements of any new species located.
Continue to gather information on native fish populations and their specific management requirements; take steps necessary to ensure their long-term survival.

STRATEGY
Introduced Plants
Fulfil the obligations of the <i>Natural Resources Management Act 2004</i> and undertake weed control programs as resources permit, with the priority on scheduled weeds of regional concern and those threatening park values.
Continue with regional projects designed to control introduced plant populations and enhance populations of native species.
Maintain liaison and work cooperatively with the South Australian Arid Lands Natural Resources Management Board.
Introduced Animals
Maintain liaison and work cooperatively with the South Australian Arid Lands Natural Resources Management Board and fulfil the obligations of the <i>Natural Resources Management Act 2004</i> within allocated resources.
Continue with the Vulkathunha-Gammon Ranges National Park feral goat control program, which may involve mustering, ground and aerial shooting. Encourage and support the regional feral goat control program and monitor the effectiveness of that program.
Undertake control of goats, foxes, cats and donkeys as need and opportunities arise, techniques improve and resources permit.
Continue broad scale fox-baiting program across the park and on Arkaroola and in cooperation with neighbours expand the baited area to include adjacent landholdings where Yellow-footed Rock-wallabies are known to occur.
Undertake rabbit control programs including warren ripping where appropriate and as resources permit.
Allow horses to be used on the park, subject to approval, but limit their stay on the park to the absolute minimum.
Maintain contributions and involvement with the Dog Fence Board in implementing the Lake Frome Buffer Strategy to reduce Dingo populations.
MANAGING FIRE
Develop, implement and review fire management plans in association with CFS and other stakeholders.
Exclude use of heavy earth-moving equipment and vehicle-based fire suppression tactics from the Strict Protection Zone of the park.
Maintain fire suppression equipment and water supplies on the park, consistent with perceived risk and the personnel available to operate the equipment. Maintain public roads and access tracks to support any necessary fire management or suppression activities.
Research Adnyamathanha use of applied fire and investigate and maintain records of the fire history of the Park and surrounding areas. Monitor vegetation composition and structural changes resulting from any wildfire events, and research the environmental requirements for fire as an aide to revegetation.
Monitor campfires and take whatever steps are necessary to minimise adverse impacts.

STRATEGY
MANAGING TOURISM AND RECREATION
Visitor Use
Support initiatives by Adnyamathanha traditional owners in cultural interpretation and tourism.
Continue present maintenance regime and investigate options for the future development of improved visitor facilities (including overflow camping areas) and access to same for park visitors, based on visitor demand and subject to overall park management objectives, available resources and statewide priorities.
Give emphasis to the Balcanoona Park Headquarters, various historic and cultural day visit sites and associated car parks and access tracks as visitor foci, with well designed management constructions (facilities, infrastructure, barriers, paths, rails and signs etc) that can withstand the impacts, protect values and assist in providing interpretive information.
Maintain and improve the park information, walker registration and camping permit system that currently operates, with the proviso that visitors remain primarily responsible for their own safety.
Visitor statistical records are compiled to assist in planning visitor facilities, with visitor numbers and opinions being regularly monitored and vehicle-counting equipment maintained to better understand visitor needs and the flow of traffic.
Limited bicycle and horse riding may be allowed in the park, subject to codes of conduct and within a management framework that places strict limits on where these activities take place.
Establish and maintain liaison with user groups and event organisers, and develop and implement appropriate codes of conduct. In association with Bike SA, develop a bicycle use and access strategy for the park.
Visitor Access
No walking trails should be constructed, marked or maintained within the Strict Protection Zone of the park. Management actions that result in a visual intrusion will only be considered for public safety reasons and where the alternative of doing nothing could result in a significant public risk.
The numbers of walkers and places visited will be regularly monitored and any controls on access considered necessary for cultural or environmental reasons put in place. Special attention will be given to the Strict Protection Zone in this regard.
Maintain the walker registration system, but with the proviso that responsibility remains with intending walkers to make all necessary arrangements for the appropriate authorities to be notified if they are overdue.
Maintain bushwalking information signs, containing useful information relating to the walking time required, degree of difficulty, equipment and permits required, water sources and a reminder for overnight walkers to register.
Maintain self-guided walking tracks of comparatively short duration and degree of difficulty from car park trailheads at selected localities.
Maintain liaison with the South Australian Tourism Commission, Department of Recreation and Sport and various community groups representing bushwalkers.
Assess all tracks and close or open them to comply with the zoning prescriptions outlined in this plan of management and to best meet cultural and environmental objectives. Retain the option to temporarily close off public access in wet weather to prevent additional track damage occurring or for cultural or environmental reasons.
Establish a track and trail rationalisation/maintenance program to provide clearly defined routes for visitors while eliminating duplication and reducing impacts on park values.
Consult with neighbours and other agencies (eg Transport SA) concerning vehicle access and road management, ensuring that road construction works are remediated by the appropriate authority.

STRATEGY
Visitor Facilities
Maintain the existing car-camping areas and investigate requirement for additional sites, subject to the zoning provisions in this management plan and prior cultural survey and assessment.
Permit bushwalkers (only) to camp overnight within the Strict Protection and Conservation Zones of the park.
Continue to repair and restore accommodation structures within the Park as resources permit. Maintain the historic fabric of those structures nominated for conservation.
Develop and maintain day-visitor areas at Grindell's Hut, Weetootla, Italowie and Arcoona as well as at Balcanoona.
Commercial Tourism
Review existing commercial visitor service operations and consider additional requests to allow private sector and other parties to undertake commercial tourism ventures on the park. Issue Commercial Licences under Section 35(3) of the <i>National Parks and Wildlife Act, 1972</i> for appropriate use of the park by tour operators, if their activities are consistent with the objectives of this management plan and culturally appropriate.
Encourage Adnyamathanha people to become involved with commercial tourism and to conduct guided tours of places of historic and cultural interest including culturally sensitive areas (when and where appropriate).
Information and Interpretation
Key tourism messages to be promoted will be developed in consultation with the Adnyamathanha community, Northern Region Development Board, the South Australian Tourism Commission, and other agencies.
Incorporate key tourism messages into visitor programs and information, and provide pre-visit information about the park from suitable outlets, as well as liaising with regional tourist authorities and the South Australian Tourism Commission.
Incorporate Adnyamathanha place names into information material and signposting.
Support initiatives by the Adnyamathanha traditional owners in cultural interpretation and associated tourism ventures.
MANAGING RESOURCE USE
Management Infrastructure
Conduct an inventory of existing infrastructure and built assets and compile a long-term asset management plan for the park; regularly update this plan and budget for an annual asset maintenance program.
Compile a comprehensive visitor facilities plan for the park. As a first step in implementing this plan, complete the upgrading of the Balcanoona Headquarters precinct and undertake stabilisation/restoration work on other buildings and structures elsewhere in the park that are considered to be of historic significance.
Maintain water supplies considered necessary for visitor use and firefighting.
Develop and implement an effective waste management strategy.
Exploration and Mining
Research information on mining history as a component of visitor information and interpretation.
Any former mine sites are either restored to more natural condition, or if retained for their heritage value, kept in a safe and stable condition.
Maintain effective liaison with proponents of mineral exploration and extraction activities on adjoining land and with Transport SA regarding borrow pits.

STRATEGY
Public Utilities
Maintain accurate records of any utility services, to minimise the likelihood of inadvertent damage as a result of park maintenance or development works.
Maintain liaison with utility authorities and periodically review access requirements, maintenance programs and future plans.
Review any proposal for the location of additional utilities on or over the park against the objectives of this management plan, current DEH policy and in consultation with the Adnyamathanha traditional owners.
Leases and Licences
Explore alternatives for out-sourcing visitor facility management and assess any other leasing/licensing proposals. If and when approved, set lease/licence terms and conditions and monitor compliance, ensuring operations are consistent with the natural, cultural and heritage values of the park.
Maintain ongoing liaison with Arkaroola management as to airstrip operation; similarly maintain effective working relationships with any other (potential) lessees.
INVOLVING THE COMMUNITY
To help integrate the park's biodiversity and recreation management with that of the Northern Flinders Ranges, encourage the development of and contribute to partnership arrangements with regional boards, recreational user groups and other relevant organisations and individuals that have an interest in the sustainable management of the region.
Encourage the involvement of universities and other institutions in research and volunteer programs.
MANAGING LAND TENURE
Support any complementary regional initiatives and develop and maintain cooperative management arrangements with the managers of adjoining land to achieve conservation, cultural and recreational outcomes that accord with the objectives in this plan.
Investigate all opportunities to conserve land to improve park values and consolidate park boundaries.
Manage all land additions to the park according to the principles outlined in this management plan.

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APPENDIX A: SPECIES OF CONSERVATION SIGNIFICANCE

Flora Species of Conservation Significance

Total Number of species recorded = 977

Total Number of SA threatened species = 42

SPECIES	COMMON NAME	CONSERVATION STATUS ⁴	
		EPBC Act	NPW Act
<i>Acacia araneosa</i>	Spidery Wattle	V	E
<i>Anogramma leptophylla</i>	Annual Fern		R
<i>Aristida arida</i>			R
<i>Atriplex eichleri</i>	Eichler's Saltbush		R
<i>Atriplex kochiana</i>	Koch's Saltbush		V
<i>Austrostipa breviglumis</i>	Cane Spear-grass		R
<i>Austrostipa petraea</i>	Flinders Range Spear-grass		R
<i>Austrostipa pilata</i>	Prickly Spear-grass		V
<i>Austrostipa tuckeri</i>	Tucker's Spear-grass		R
<i>Calotis lappulacea</i>	Yellow Burr-daisy		R
<i>Codonocarpus pyramidalis</i>	Slender Bell-fruit	V	E
<i>Daviesia stricta</i>	Flinders Ranges Bitter-pea		R
<i>Derwentia decorosa</i>	Showy Speedwell		R
<i>Dianella longifolia</i> var. <i>grandis</i>	Pale Flax-lily		R
<i>Dodonaea subglandulifera</i>		E	E
<i>Doodia caudata</i>	Small Rasp-fern		E
<i>Eremophila subfloccosa</i> ssp. <i>Glandulosa</i> (R.Bates 32961)	Green-flower Emubush		R
<i>Eucalyptus</i> sp. <i>Flinders Ranges</i> (D .Nicolle 562)	Flinders Ranges Box		R
<i>Eucalyptus viridis</i> ssp. <i>viridis</i>	Green Mallee		R
<i>Frankenia cupularis</i>			R
<i>Frankenia subteres</i>			R
<i>Gilesia biniflora</i>	Western Tar-vine		R
<i>Goodenia chambersii</i>			R
<i>Goodenia lobata</i>			R
<i>Goodenia saccata</i>	Flinders Ranges Goodenia		R
<i>Haeckeria punctulata</i>	Sticky Haeckeria		R
<i>Logania saxatilis</i>	Rock Logania		R

⁴ See Appendix B for Conservation Status Code Definitions.

SPECIES	COMMON NAME	CONSERVATION STATUS ⁴	
		EPBC Act	NPW Act
<i>Malacocera gracilis</i>	Slender Soft-horns		V
<i>Ozothamnus scaber</i>	Rough Bush-everlasting		V
<i>Philothea angustifolia</i> ssp. <i>angustifolia</i>	Narrow-leaf Wax-flower		R
<i>Picris squarrosa</i>	Squat Picris		R
<i>Podolepis jaceoides</i>	Showy Copper-wire Daisy		R
<i>Pteris tremula</i>	Tender Brake		R
<i>Santalum spicatum</i>	Sandalwood		V
<i>Swainsona behriana</i>	Behr's Swainson-pea		V
<i>Swainsona leeana</i>	Lee's Swainson-pea		R
<i>Swainsona oligophylla</i>			R
<i>Swainsona sericea</i>	Silky Swainson-pea		E
<i>Swainsona tephrotricha</i>	Ashy-haired Swainson-pea		R
<i>Swainsona viridis</i>	Creeping Darling Pea		V
<i>Zygophyllum humillimum</i>	Small-fruit Twinleaf		R
<i>Zygophyllum hybridum</i>			R
42		3	42

Fauna Species of Conservation Significance

Total Number of species recorded = 200

Total Number of SA threatened species = 7

SPECIES	COMMON NAME	CONSERVATION STATUS ²	
		EPBC Act	NPW Act
<i>Amytornis striatus</i>	Striated Grasswren		V
<i>Aprasia pseudopulchella</i>	Flinders Worm Lizard	V	V
<i>Climacteris affinis</i>	White-browed Treecreeper		R
<i>Falco peregrinus</i>	Peregrine Falcon		R
<i>Morelia spilota</i>	Carpet Python		V
<i>Petrogale xanthopus</i>	Yellow-footed Rock-wallaby	V	V
<i>Pyrholaemus brunneus</i>	Redthroat		R
7		2	7

² See Appendix B for Conservation Status Code Definitions.

APPENDIX B: CONSERVATION STATUS CODES

Australian Conservation Status Codes

Environmental Protection and Biodiversity Conservation Act 1999

The following status codes are based on the current listing of species under Section 179 of the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*.

- EX Extinct:** there is no reasonable doubt that the last member of the species has died.
- EW Extinct in the Wild:** known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
- CE Critically Endangered:** facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
- E Endangered:** facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
- V Vulnerable:** facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
- CD Conservation Dependent:** the species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

Note: Prescribed criteria as defined under the IUCN Red List of Threatened Species.

South Australian Status Codes

National Parks and Wildlife Act 1972

The following status codes are based on the current listing of species under Schedules of the South Australian *National Parks and Wildlife Act 1972*, as amended in 2000.

- E Endangered:** (Schedule 7) in danger of becoming extinct in the wild.
- V Vulnerable:** (Schedule 8) at risk from potential or long term threats which could cause the species to become endangered in the future.
- R Rare:** (Schedule 9) 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.

Regional Status Codes

The categories below apply to the species distribution at a regional level.

Mammals, Reptiles & Amphibians

There are no regional conservation status categories developed for mammals, reptiles or amphibians to date (2005).

Birds

Regional conservation status for birds follow Carpenter and Reid (1998) *The Status of Native Birds in the Agricultural Areas of South Australia*;

The regions are defined as follows;

ML	Mount Lofty	MN	Mid-North	SE	South-Eastern	KI	Kangaroo Island
MM	Murray Mallee	EP	Eyre Peninsula	YP	Yorke Peninsula		

Plants

Regional conservation ratings for plants follow:

Lang, P.J. & Kraehenbuehl, D.N. (2002). Plants of Particular Conservation Significance in South Australia's Agricultural Regions.

Update (2005) of unpublished database: Florlist. Department for Environment and Heritage.

The regions are as defined by the State Herbarium (Plant Biodiversity Centre), illustrated in the back cover of 'A List of the Vascular Plants of South Australia (Edition IV)' (Ed. Jessop, 1993).

NW	North-Western	FR	Flinders Ranges	NL	Northern Lofty	SL	Southern Lofty
LE	Lake Eyre	EA	Eastern	MU	Murray	KI	Kangaroo Island
NU	Nullarbor	EP	Eyre Peninsula	YP	Yorke Peninsula	SE	South-Eastern
GT	Gairdner-Torrens						

In order of decreasing conservation significance:

- 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:** (*Plants only*) likely to be either endangered or vulnerable but insufficient data available for more precise assessment.
- V Vulnerable:** rare and at risk from potential threats or long term threats that could cause the species to become endangered in the future.
- K Uncertain:** likely to be either threatened or rare but insufficient data available 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 or widespread 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 significance.
- N Not of particular significance** (*Plants only*) also indicated by a blank entry.
- C Common** (*Birds only*) also indicated by a blank entry.
- O Occasional Visitor Only** (*Birds only*) not considered of conservational status.