

**THE ROCK NATURE RESERVE
PLAN OF MANAGEMENT**

NSW National Parks and Wildlife Service

February 2000

This plan of management was adopted by the Minister for the Environment on 7th February 2000.

Acknowledgments: The assistance of the Griffith District Advisory Committee and those individuals and groups who made submissions on the exhibited draft plan of management are gratefully acknowledged.

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FOREWORD

The Rock Nature Reserve is located in the southern Riverina of NSW, approximately 6km west of the small township of the Rock on the Lockhart Road. The nearest main centres are Wagga Wagga and Lockhart. The reserve covers an area of 340.7 hectares.

The Rock is one of the few remaining outcrops of Devonian age sediments in the region and lies on the boundary between two major physiographic regions: the Riverine Plain and the western slopes of the Eastern Highlands.

The Rock Nature Reserve provides an island of natural habitat for many native animals with nearly 100 birds species being recorded on the reserve. The Turquoise Parrot and Glossy Black-Cockatoo, listed as vulnerable under the *Threatened Species Conservation Act 1995*, have both been recorded on the reserve.

The Rock Nature Reserve is an important area for the protection of *Senecio garlandii*, a perennial shrub which has an extremely restricted geographical distribution and is classified as vulnerable under the *Threatened Species Conservation Act 1995*. The Reserve supports the largest known population of this species and is one of the few protected areas within which the species grows.

The reserve is also an important recreational resource in the Riverina, being one of the few remaining areas of natural environment. It is important to allow for continued recreational use in a manner which minimises environmental damage.

This plan of management establishes the scheme of operations for The Rock Nature Reserve. In accordance with Section 76 of the National Parks and Wildlife Act 1974, this plan of management is hereby adopted.

Bob Debus
Minister for the Environment

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1. INTRODUCTION

The *National Parks and Wildlife Act 1974* requires that a plan of management be prepared for each nature reserve. A plan of management is a legal document that outlines how the area will be managed in the years ahead.

The procedure for the adoption of a plan of management for a nature reserve is specified in the Act and involves the following:

- * The Director-General gives notice that a plan of management has been prepared.
- * The plan and copies of all the representations are referred to the National Parks and Wildlife Advisory Council for consideration.
- * The Director-General submits the plan together with any comments and suggestions of the Council to the Minister.
- * The Minister may adopt the plan after considering the comments of the Advisory Council or he may refer the plan back to the Director-General and Council for further consideration.

Once a plan has been adopted by the Minister, no operations may be undertaken within the nature reserves except in accordance with the plan.

A plan of management for The Rock Nature Reserve was placed on public exhibition from 6th March to 31st May 1999. The exhibition of the draft plan attracted 11 submissions which raised 12 issues. The draft plan and all submissions received in response to the public exhibition were carefully considered by the National Parks and Wildlife Advisory Council and by the Minister for the Environment before adopting this plan of management.

Additional information on the The Rock Nature Reserve and this plan of management can be obtained from:

National Parks and Wildlife Service
200 Yambil Street
P.O. Box 1049
GRIFFITH 2680
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2. MANAGEMENT CONTEXT

2.1. Nature Reserves in NSW

Fauna reserves in New South Wales were first established under the *Fauna Protection Act 1948*, which was replaced by the *National Parks and Wildlife Act 1967*. Under the latter Act, fauna reserves were reclassified as nature reserves. The 1967 Act was replaced by the *National Parks and Wildlife Act 1974*.

Under the National Parks and Wildlife Act, nature reserves are areas of special scientific interest containing wildlife or natural environments or natural phenomena.

The purposes of nature reserves are defined in the Act as:

- (a) the care, propagation, preservation and conservation of wildlife;
- (b) the care, preservation and conservation of natural environments and natural phenomena;
- (c) the study of wildlife, natural environments and natural phenomena; and
- (d) the promotion of the appreciation and enjoyment of wildlife, natural environments and natural phenomena.

Nature reserves are valuable refuge areas, where natural processes, phenomena and wildlife can be studied. They differ from national parks which include as a major objective the provision of appropriate recreation opportunities.

2.2. The Rock Nature Reserve

2.2.1 Location, history of reservation and regional context

The Rock Nature Reserve is located on the Southern Riverina of NSW, approximately 6km west of the small township of The Rock on the Lockhart Road. The nearest main centres are Wagga Wagga and Lockhart.

The area comprising the reserve was originally part of the initial “Hanging Rock” run, which was taken up by Dr. James Wall in 1849. In 1862 the area was surveyed and The Rock and its immediate surrounds were gazetted as a crown reserve. Quarrying began on The Rock’s lower slopes in 1891 to provide ballast for the Sydney-Melbourne railway and continued until about 1940.

The original area of The Rock Nature Reserve, gazetted in August 1962, was approximately 271.1 hectares. In June 1970, an additional area of 69.6

hectares was gazetted bringing the present total area of The Rock Nature Reserve to 340.7 hectares.

The surrounding landuse is predominantly sheep farming and mixed cropping, with The Rock Common adjoining the north-eastern boundary and the local council refuse dump approximately 150m from this boundary.

2.2.2. Importance of The Rock Nature Reserve

The unique geology and geomorphology of The Rock Nature Reserve has resulted in an area of high natural, scenic and recreational values.

The reserve is one of a number of small to moderately sized conservation areas on the central and south-western slopes and plains of NSW which sample early to mid Palaeozoic rocks of the Lachlan Fold Belt of Eastern Australia. These regionally important protected areas include Goobang, Conimbla, Weddin Mountains, Nangar and Cocoparra National Parks and Tabletop Nature Reserve.

Landsystems

The reserve is located in south-western NSW on the boundaries between two major biophysical regions; the Riverine Plains and the Western Slopes of the Eastern Highlands. The resulting geography gives the area a great diversity of landscape and habitat.

The main geological significance of the Rock Nature Reserve lies in its spectacular formation caused by a pressure uplift and the breaking off of an overhang. There is no other formation like this in the District.

The Rock is one of the few remaining outcrops of Devonian age sediments in the region. The bedrock in the area is composed of metamorphosed sedimentary rocks associated with intruded masses of igneous rock. The injection of the igneous rock as molten magma also resulted in the deposition of economic ore bodies. Veins of gold, lead and wolfram have been mined in the region.

The summit of the ridge stands 364m above the surrounding plain and the view from the top of The Rock is spectacular. Galore Hill to the west is often clearly visible and on clear days in spring and winter the snow-capped peaks of Mount Kosciuszko, the Victorian Alps and Bogong Range can be sighted.

Native Plant and Animal Communities

The Rock Nature Reserve is located in the South West Slopes botanical subdivision of New South Wales. It is within the Riverina Bioregion (Thatchway and Creswell) which has only 0.32% conserved. It is also an area which has been intensively modified for agriculture and grazing due to the flat and gently undulating topography of the region. The Rock Nature Reserve

provides an important refuge for a number of plant and animal communities that are typical of the ranges of this part of the state. This contrasts significantly with the cleared plains surrounding the range.

The nature reserve protects the habitat requirements of at least one threatened plant species, the Woolly Ragwort *Senecio garlandii* as well as a number of locally rare species (Burrows, in press). *S garlandii* grows at the base of the cliff face at The Rock Nature Reserve and has an extremely limited range as it only occurs on the sheltered slopes of rocky outcrops from West Wyalong to Albury District. The reserve is one of only three protected areas in which this species occurs (the others are Ulandra and Tabletop Nature Reserves) and contains the largest known population of the species (Burrows 1995).

The reserve also protects the habitat of threatened mammal and bird species, such as the Squirrel Glider *Petaurus norfolcensis*, Greater Long-eared Bat *Nyctophilus timoriensis*, Turquoise Parrot *Neophema pulchella*, Pink Robin *Petroica rodinogaster* and Glossy Black Cockatoo *Calyptorhynchus lathami*, which have all been recorded in the reserve.

Almost 100 bird species have been recorded on the reserve, with a number of migratory species using the reserve during their southern migration. The Rock Nature Reserve is large enough to still maintain a viable population of a number of bird species that have been lost from other smaller remnants. The reserve offers a variety of habitats and is an important site for local Raptors. The rocky outcrops protected within the reserve provide valuable nesting sites for Peregrine Falcons *Falco peregrinus*.

Cultural Heritage

The Rock is located within the area previously occupied by the Wiradjuri people. Little is known of the Aboriginal history or economy of the eastern part of the Western Division and a large part of the territory of the Wiradjuri nation has been modified for agriculture.

Whilst no physical evidence of Aboriginal occupation has been found on the reserve to date, oral history indicates that The Rock may have played some role in initiation ceremonies where the front teeth of young males were knocked out. Historically The Rock was known as Kengol by the Wiradjuri tribe and the creek just south of the reserve is known as Yerong, a Wiradjuri word meaning 'a place of initiation' or 'tooth'.

The strong attachment of Aboriginal people to their land and culture is now being acknowledged by the European community. Archaeological and mythological sites are important to Aboriginal communities as they are a testament to their culture's great antiquity.

Charles Sturt first saw The Rock in 1829 and the area was settled by Europeans in 1847. The landform was known as 'The Hanging Rock' as the eastern face had a spectacular overhang. The local township took on this

name until 1918 when it was formally changed to The Rock. The name change was a direct result of a rock fall which occurred in 1874 and considerably altered the profile of the eastern face.

Education and Research

The reserve is one of the few naturally vegetated areas in the district and is valuable for field studies because of its variety of features and easy accessibility. The reserve is used for educational purposes by schools and tertiary institutions in the area and by groups such as the Field Naturalist Society.

Recreation

The Rock Nature Reserve is one of the few remaining areas in the Riverina where the public can enjoy the natural environment and it is an important recreational resource for both the local community and the Wagga Wagga district.

A picnic area and associated day use facilities are provided close to the entrance of the reserve and opportunities are available for bush walking in the rugged and interesting scenery. Kangaroos and many of the birds such as parrots, cockatoos, wrens, raptors and honeyeaters are easily seen by visitors. Spring wildflower displays are another attraction of the area.

The reserve is occasionally used for orienteering events and the cliff faces in the reserve are used for rock sports, particularly rock climbing.

Statement of Significance

The conservation significance of The Rock Nature Reserve can be summarised as follows:

Nature Conservation Value:

- the reserve is part of a group of conservation areas that protect a representative sample of habitats once widespread in the central western slopes and plains of NSW;
- the reserve protects the habitat of native plants and animals in an area that has been largely cleared for agriculture; and
- the reserve contains significant populations of several vulnerable plant and animal species.

Cultural Heritage Value:

- oral history surrounding The Rock indicates it may have played an important role in initiation ceremonies for the Wiradjuri tribe.

- the reserve has important local historical value as it illustrates the history of exploration, transport and pastoral use of the district.

Environmental Education Value:

- the reserve is important for research and environmental educational as it is one of the few remaining areas of natural vegetation in the district and contains interesting natural features not readily accessible elsewhere.

Recreation and Tourism Value

- the reserve offers opportunities for day use activities in a natural setting for both the local community and visitors to the region.
- the reserve provides easily accessible opportunities for walking, picnicking and a variety of rock sports and other recreational pursuits.
- the reserve is one of the few areas of natural bushland close to Wagga Wagga and has historically been a recreational resource for the local community.

3. OBJECTIVES OF MANAGEMENT

The following general objectives relate to the management of nature reserves in New South Wales:

- * protection and preservation of the scenic and natural features;
- * conservation of native plants and animals;
- * maintenance of natural processes;
- * protection and preservation of cultural resources;
- * promotion of the appreciation and enjoyment of wildlife, natural environments and natural phenomena; and
- * encouragement of scientific and educational enquiry into environmental features and processes, into prehistoric and historic features and into reserve use patterns.

In addition to those general objectives the following specific objectives apply to The Rock Nature Reserve:

- * conservation of The Rock Nature Reserve as a representative sample of the south west slopes region and one of the few conservation areas in the Riverina Bioregion;
- * protection of the Woolly Ragwort community and of nesting opportunities for Peregrine Falcons;
- * promotion of the fragile nature of The Rock Nature Reserve and the importance of appropriate use to minimise negative impacts on the values of the reserve; and
- * provision of facilities for walking, picnicking and rock climbing which permit use of the reserve in a safe and responsible manner.

4. POLICIES AND FRAMEWORK FOR MANAGEMENT

This section contains the policies and framework for the management of The Rock Nature Reserve together with relevant background information. Policies are summarised under the following headings:

- * Natural Landscapes;
- * Cultural Heritage; and
- * Use of the Nature Reserve.

The policies established in this plan of management provide the framework for management consistent with anticipated resources available to the Service and anticipated community trends over the next five to ten years.

The actions identified are those to which priority will be given in the foreseeable future. Other management actions may be developed over the life span of this plan of management consistent with the objectives and policies set out in the plan.

Where not specifically provided for in this plan of management, the management of The Rock Nature Reserve will be in accordance with the National Parks and Wildlife Act and with general Service policies.

4.1 NATURAL LANDSCAPES

4.1.1 Geology, landforms and soils

The following description of geology and landforms has been taken from Dare-Edwards, 1988.

The Rock Nature Reserve lies on the boundary between two major physiographic regions, the Riverine Plain and the western slopes of the Eastern Highlands. The ridge of resistant rock which forms The Rock is part of the last hill country of the western slopes. The low gradient, poorly drained alluvial plain with its meandering incised creeks and shallow relict lakes lying west of the reserve is part of the Riverine Plain.

The Rock is a 6 kilometre long, north-south ridge with a maximum width of 1.5 km at its northern end. The summit of the ridge stands 364m above the adjacent plain. Structural control by the underlying bedrock results in the characteristic "hogsback" morphology of The Rock. The west facing slope is steeper than the eastern face and the scarps and cliff lines with a well developed talus slope below only occur on the eastern face.

The bedrock in the area is composed of metamorphosed sedimentary rocks associated with intruded masses of igneous rock. The injection of the igneous rock as molten magma also resulted in the deposition of economic ore bodies. Veins of gold, lead and wolfram have been mined in the region.

The Rock is one of the few remaining outcrops of Devonian age sediments in the region. The lithology of The Rock and the other Devonian outcrops is primarily quartzites and slates with frequent quartz veins.

The development of deep V-shaped gullies and lightly vegetated slopes have led to the deposition of alluvial fans on the lower slopes and in the bases of gullies. The soil types contained within the nature reserve are Red/Brown and Grey Podsolics, reaching good depth in the gullies. Steeper slopes have very poor soil cover or are of scree formation.

The lower slopes of the reserve have been quarried for gravel, most notably the north-eastern slopes. This area is slowly regenerating but is very fragile as the topsoil has been lost. There is a network of old tracks through the quarry area which members of the public inadvertently use due to poor directional signage. Public use will be discouraged by appropriate signage and regeneration of native flora will continue.

There is evidence of erosion on the ridge slopes in the east of the reserve most notably near the main rock climbing face and behind the gravel quarry area. The public will be discouraged from walking up these steep unstable areas, some of which may rehabilitate naturally once visitor pressure is reduced. The "descent gully" near the main rock climbing face will not stabilise or regenerate while it is being used by rockclimbers to descend from the ridge. Stabilisation of the descent gully will be investigated and climbers encouraged to descend the same way they ascended, ie via the rock face. Erosion and "shortcuts" that develop on the Yerong walking track will be rehabilitated.

Policies

- * The significant geological and landscape features of the nature reserve will be protected from disturbance.
- * Where soil erosion occurs as a result of recreation or management use, remedial works such as modification to facilities, restriction of use and rehabilitation will be undertaken.
- * All work carried out in the nature reserve will be designed and undertaken so as to minimise soil erosion.
- * The Service will encourage the co-operative management of reserve catchments by involvement with appropriate total catchment management committees.
- * Mining, exploration and extraction will not be permitted in the nature reserve.

Actions

- * Erosion control measures and restoration works will be carried out on the Yerong walking track where necessary.
- * A review will be undertaken to determine the need for erosion control measures on the fire trails constructed during the 1991 fire.
- * Following assessment, remedial work on the gravel quarried areas and “descent gully” will be considered.
- * Signage will be used to direct the public away from sensitive or unstable areas.

4.1.2 Native Plants

The vegetation of The Rock is classified as an open woodland with the plant associations changing with altitude and clearing history. The woodland of the lower slopes is dominated by a mixture of Grey Box (*Eucalyptus microcarpa*), Blakely’s Red Gum (*Eucalyptus blakeyi*) and White Box (*Eucalyptus albens*) with occasional White Cypress Pine (*Callitris glaucophylla*). Patches of Black Cypress Pine (*Callitris endicheri*) are common and there are thickets of Stringybark (*Eucalyptus macroryncha*). The understorey in this woodland is sparse and consists of grasses, wattles and other shrubs.

In the disturbed quarry sites, isolated Dwyer’s Mallee Gums (*Eucalyptus dyweri*) are frequent.

As the slopes become steeper and the soils thinner the Blakely’s Red Gum (*Eucalyptus blakeyi*) and the Grey Box (*Eucalyptus microcarpa*) first become spindly and smaller before being lost from the plant association altogether. The trees on these high slopes are mainly White Box (*Eucalyptus albens*) and Currawang (*Acacia doratoxylon*) in a mixture of mallee and box habits.

At the base of the steep slopes there is a heath understorey of low shrubs such as Rusty Spider-Flower (*Grevillea floribunda*), Native Cranberry (*Astroloma humifusum*), Peach Heath (*Lissanthe strigosa*), Urn Heath (*Melichrus urceolatus*), Grass Trees (*Xanthorrhoea australis*) and Kangaroo Thorn (*Acacia paradoxa*).

Along the ridge the bare rock surfaces have a cover of mosses, lichens and algae. Tree cover consists of Currawangs (*Acacia doratoxylon*) and Dwyer’s Mallee Gum (*Eucalyptus dyweri*) mixed with Hill Oaks (*Allocasuarina verticillata*). Shrubs include Sticky Wallaby Bush (*Beyeria viscosa*) and Common Fringe Myrtle (*Calytrix tetragona*).

At the base of the cliffs, in shady moist sites are clumps of the rare Woolly Ragwort (*Senecio garlandii*). *Senecio garlandii* is a perennial shrub that has an extremely restricted geographical distribution, occurring only on the

western slopes of the Dividing Range between West Wyalong and Albury. The species is classified as vulnerable under the *Threatened Species Conservation Act 1995*.

The Rock Nature Reserve is an important area for the protection of *Senecio garlandii* as it supports the largest known population of the species and is one of the few formally protected areas within which the species grows (Burrows, 1995).

Policies

- * Native vegetation will be managed to maintain the reserve's floristic and structural diversity.
- * Native vegetation will be managed to maximise habitat values for the native animal species that depend on the reserve.
- * Research into the distribution and habitat requirements of vulnerable and endangered plant species will be encouraged.
- * Populations of vulnerable and endangered species will be monitored and where necessary, measures will be taken to ensure their long term survival.
- * Any revegetation undertaken at The Rock Nature Reserve will use local seed sources in line with the Service's field management policy to maintain genetic integrity within the reserve.

Actions

- * Research into the reserve's ecology will be encouraged. The collection of information on vulnerable and endangered plants species and associated vegetation communities will be given priority.
- * A regular monitoring program will be established for key vegetation communities.
- * The distribution of *Senecio garlandii* will be mapped and a monitoring program established. A species management plan may be prepared if warranted.

4.1.3 Native Animals

Surrounded by agricultural land, The Rock Nature Reserve provides an island of natural habitat for many native animals. Due to the small size of the reserve, it is important for neighbouring lands to be managed sympathetically for wildlife conservation which will provide additional habitat and protection for native species. Bird life abounds in the reserve, with nearly 100 species being recorded including birds of prey, parrots, robins and honeyeaters.

Many of the rock faces have been heavily eroded, providing excellent nesting sites for birds such as the Peregrine Falcon *Falco peregrinus*. Limited research has been conducted into the mammals, reptiles and amphibians of the reserve and it is likely that a larger diversity occurs than has presently been recorded. Likewise, several threatened species are found at the reserve however others may occur that have not yet been recorded.

The Turquoise Parrot *Neophema pulchella*, the Pink Robin *Petroica rodinogaster* and the Glossy Black Cockatoo *Calyptorhynchus lathami* have been sighted on the reserve. These species are listed as vulnerable under the *Threatened Species Conservation Act 1995*. The Gang-gang Cockatoo has also been recorded at the reserve and its sighting is significant as the reserve is at the western most end of its range.

The Squirrel Glider *Petaurus norfolcensis* and Greater Long-eared Bat *Nyctophilus timoriensis* have been recorded for the reserve and are listed as vulnerable under the *Threatened Species Conservation Act 1995*. Two macropod species have been recorded on the reserve: the Grey Kangaroo and the Swamp Wallaby. Other native mammals that have been sighted include Echidnas, Common Ringtail and Common Brushtail Possums, Yellow-footed Antechinus and two bats, the Lesser Long-eared Bat and the Little Forest Eptesicus.

A number of reptiles have also been recorded on the reserve including Lace Monitors, Gould's Goanna, Bearded Dragons and a variety of common Skinks and Geckos.

Policies

- * The reserve will be managed to conserve native animal species. Priority will be given to the protection of vulnerable and endangered species.
- * Research into the location and management requirements of the reserve's native animals will be encouraged.

Actions

- * An inventory will be undertaken to establish a comprehensive fauna species list for the reserve.
- * Sympathetic management of neighbouring lands for wildlife conservation will be encouraged and where appropriate land will be acquired for the reserve system.

4.1.4 Introduced Plants And Animals

An introduced species is defined in this plan as any plant or animal species not native to the reserve. Introduced species within the reserve and on adjoining land are of concern because they have the potential to have detrimental effects on the reserve's resources and can spread to and from neighbouring land.

The *Noxious Weeds Act 1993* places an obligation upon public authorities to control noxious weeds on land that it occupies to the extent necessary to prevent such weeds spreading to adjoining lands.

A survey of the distribution and abundance of weeds within The Rock Nature Reserve was conducted from November to February 1995. Occasional plants of the noxious weed Paterson's Curse (*Echium plantogineum*) were located in the disturbed area in the south-eastern corner of the reserve. The noxious weed Horehound (*Marrubium vulgare*) has also been recorded for the reserve.

The weed survey identified two main areas of potential hazard for weed invasion. The open area in the south-east corner of the reserve that was disturbed during fire trail construction and the area surrounding the gate on the northern boundary.

The presence of the town refuse dump near the eastern boundary of the reserve is also a potential threat. The tip provides a ready source of food and possibly shelter for feral animals particularly foxes, pigs and cats. The dumping of garden waste in the tip is also of concern as weed species can establish and spread onto the reserve. The Service will liaise with Lockhart Shire Council to minimise impacts from potentially harmful pest species which may harbour in the refuse area.

Rabbit numbers are low in the reserve and whilst they are a declared noxious animal they are considered a low priority for control in this reserve. Goat numbers vary but are generally believed to be low. Cat and fox numbers are unknown but will be present due to the close proximity of the refuse tip and surrounding farming activities. Cat, fox and dog numbers are likely to increase with the development of the housing estate on the western side of the reserve.

Pig numbers are low but they have been known to use the reserve as a corridor between the refuse tip and crops on the other side of the reserve. The distance restriction from habitation will prevent the use of 1080 baits for feral animal control on the western and northern sides of the reserve.

Policies

- * Priority for control of introduced species will be given to those which:
 - . conflict with significant natural resources;
 - . are causing damage to cultural resources;

- . are or may affect neighbouring lands;
 - . may be a threat with regard to disease;
 - . have a high capacity for dispersal;
 - . are new isolated occurrences; and/or
 - . have the potential to be spread through internal access systems.
- * Where possible any control programs that are implemented will be co-operative programs with neighbours, Wagga Rural Lands Protection Board and Lockhart Shire.
 - * Domestic animals and stock will not be permitted in the reserve.
 - * No European honey bee hives will be permitted within the reserve.
 - * Environments currently free of introduced species that are known to be susceptible to invasion by introduced species will be monitored. Control/eradication measures will be implemented in these areas if invasion occurs.

Actions

- * Known occurrences, distribution and density of introduced species causing, or having potential to cause, significant environmental damage will be mapped and their impacts assessed.
- * Control of Patersons Curse, Horehound and other detected noxious species will be undertaken.
- * Rabbits, goats, foxes, cats and pigs will be controlled where it is practical and where they are causing significant environmental damage.

4.1.5 Fire Management

Aborigines are known to have occupied eastern NSW for at least the last 20 000 years. Traditional fire practices of Aborigines in NSW have not been well researched and are therefore poorly understood. However, Aborigines are likely to have had burning regimes which encouraged pasture plants in areas in which they hunted game and kept corridors open in lands they travelled through.

Although the fire history of the nature reserve prior to European settlement is poorly understood, fire was used on a regular basis by graziers prior to the establishment of the reserve and there is some evidence from elsewhere in NSW that the vegetation of south-eastern Australia has changed since the arrival of Europeans because of their fire practices.

Fire is regarded by the NSW National Parks and Wildlife Service as a natural phenomenon, one of the established physical factors of the Australian environment to which native plant and animal communities have become adapted. The proper management of fire is essential to avoid the extinction of native plant and animal species while protecting people and their property.

The National Parks and Wildlife Service has as its primary aims in fire management:

- to reduce the risk of bushfire damage to human life and property both within and immediately adjacent to areas where the Service has a statutory responsibility;
- to effectively manage bushfires for the protection and conservation of the natural, cultural, scenic and recreational features of Service areas; and
- to co-operate with other organisations in fire management planning and implementation within any given area.

Wildfires have the potential to be most intense in The Rock area during summer when they may be driven by dry north-west and westerly winds. The major sources of fire at The Rock are likely to be lightning strikes or wildfires burning from the lands to the west of the reserve. The long term fire history of The Rock is unknown but it is thought that there was a severe fire in the 1930's. A recent fire caused by lightning in February 1991 burnt a large area of the reserve.

Fire frequency, intensity, season of occurrence and the source of fire and the subsequent path, are major factors influencing the distribution and composition of plant and animal communities. Through the use of prescribed fire and other fire management techniques, the Service has considerable potential to influence these factors. However the development of an appropriate fire regime requires understanding of the fire requirements of the native plant and animal communities. An inappropriate regime could compromise the conservation of the natural resources of the reserve.

Due to the 1991 wildfire, prescribed burning other than to protect life and property should not be required during the life of this plan. A fire management plan for the reserve will be developed as a high priority and will include an assessment and details on options for fuel management and prescribed burning. A fire frequency threshold has not been reached in the reserve since the 1991 fire; regeneration is continuing and the canopy is still developing. The fire management plan will consider fire frequency thresholds and the fire regime in relation to ecological communities within the reserve.

The intensity at which a fire burns is directly related to the quantity of accumulated dry litter and other plant material. It is also directly related to ground slope and wind speed. The following features characterise fires in the area:

- High intensity fires may result from the combination of extreme weather conditions at certain times of the year and the steep slopes occurring in most sections of the reserve.
- They may threaten human lives, property and heritage valued by the community. The control of these fires often involves considerable public expenditure and risks to firefighters including volunteers.
- Fire at frequent intervals may reduce the diversity of habitats and possibly the diversity of species within natural areas.
- Fires that burn large areas may also reduce the diversity of habitats and possibly the diversity of species because a single large fire can burn a high proportion of the woodland area of the reserve and neighbouring lands. Frequent and extensive fires may lead to the local extinction of species.
- Many animal species and communities are fire sensitive and rely on recolonisation from surrounding areas following fire. In the case of The Rock Nature Reserve, there is limited chance for recolonisation because the surrounding areas are cleared.

Contemporary ecological research in fire prone ecosystems has established broad principles about the fire regimes needed to avoid the extinction of species and thus conserve biodiversity:

- groups of plant and animal species which constitute an ecosystem respond similarly to fire according to the characteristics of their life-history. It is not necessary to specify fire regimes for the conservation of every species. Rather fire regimes for groups of species need to be defined; and
- a diversity of fire regimes is needed to maintain natural diversity. Accordingly the management of fire should aim to provide a pattern of fires of high, moderate and low intensity, frequency and extent. Extinctions are most likely when fire regimes of relatively fixed intensity, frequency and extent prevail without variation.

Scientific understanding of the fire requirements for plant communities is generally more advanced than for animal communities, although recent published research demonstrates that the conservation of many animal species also depends upon a mix of fire regimes including occasional high intensity fires. Over reliance on regular and low intensity fires has an unacceptable impact on critical habitat requirements for native animals.

With these general principles as a basis, fire management guidelines are being developed which define fire regime thresholds for several major groups of plant communities. If these thresholds are exceeded either way the decline and extinction of plant species can be expected.

Significant fire frequency thresholds have been identified for the management of fire in the following plant communities:

- Loss of species of woody plants within open forest or woodland communities may occur where the frequency of fires:
 - exceeds two fires in succession within a period of twenty years; or
 - is less than one fire about every one hundred years.

Under the Bush Fires Act the Service is a fire authority and is responsible for controlling fires on the reserves and to ensure they do not cause damage to other land or property. This responsibility includes the implementation of fuel management programs. The Service may also assist with the control and suppression of fires adjacent to the reserves. An important part of the Service's fire management is participation as a member of local Bushfire Management Committees in the preparation of district fire management plans.

Outside the Nature Reserve, fire management is performed by the local bush fire brigades. The Service will continue to promote a co-operative approach to fire fighting with these organisations as essential for both the protection of property and of the natural resources and cultural heritage of The Rock Nature Reserve.

Bushfire suppression operations may require the construction of temporary trails, helipads and fire lines. These will be closed and rehabilitated as part of post fire operations. The fire trails constructed in 1991 have been blocked and are regenerating naturally.

Policies

- * Liaison will be maintained and co-operative strategies developed with bushfire brigades, local government, and neighbours to ensure co-ordination in fire management in The Rock Nature Reserve and on adjoining lands.
- * Fire in the nature reserve will be managed in accordance with the Section 41A plan, the district fire plan, this plan of management and the reserve fire management plan when it is developed.
- * The co-operation of all relevant authorities, neighbours and visitors will be sought in eliminating unplanned fires.
- * Fire management in The Rock Nature Reserve will aim to:
 - protect human life and property both within the reserve and adjacent to it;

- maintain species habitat and diversity, avoid local extinctions of native plant and animal species and enhance the conservation of rare and endangered native plant and animal species; and
 - protect structures, objects and places of cultural heritage significance.
- * Prescription burning may be undertaken in The Rock Nature Reserve if it is required to meet fire management objectives.
- * Information concerning the management of fire in the reserve will be included where appropriate in reserve information and interpretation material.
- * Research into fire on the natural environment will be undertaken and encouraged, particularly with respect to:
- management of vegetation communities and animal habitats; and
 - fire behaviour, fire hazard and fire risk assessment.
- * The district will maintain a fire management information system to assist in the identification of high fire risk areas, and trends in fire occurrence.

Actions

- * The current fire management practices for The Rock Nature Reserve will be reviewed and a fire management plan prepared.
- * Records of fire occurrence will be maintained with particular emphasis on mapping and recording of the area, frequency, seasonality and intensity of fire.
- * Temporary trails, helipads and firelines required for bushfire suppression will be closed and rehabilitated as part of post fire operations.
- * The existing fire trail will be maintained and usage restricted to authorised vehicles only.

4.2 CULTURAL HERITAGE

The cultural heritage of an area is an important component of the environment that may have aesthetic, historic, scientific and social significance to present and future generations. The cultural heritage includes both Aboriginal and non-Aboriginal history.

4.2.1 Aboriginal Sites

The Aboriginal people of the area lived in a triangular shaped district, which ran from Bulloc-bulloc hill to Yerong Creek township to The Rock township. Such an imposing natural feature as The Rock, particularly in the flat, open country through which the Murrumbidgee River flows, would probably have had a special significance for local Aboriginal tribes, as a landmark as well as a spiritual focus.

Whilst no signs of Aboriginal occupation have been located on The Rock itself, it is believed that it may have been involved with initiation ceremonies. It is unlikely that the site would have been used as a long term camp because there was no permanent surface water available in the immediate vicinity. Sites established for initiation ceremonies may have been located nearby at Bourkes Creek, Yerong Creek or the Gap (Kabaila 1998). No surveys for cultural sites have been undertaken within the reserve. However, there is a commonly held view that no other activities were carried out at ceremonial sites, thus archaeological relics are not likely to be found.

Captain Charles Sturt in his book *Two Expeditions into the Interior of Southern Australia During the Years 1828, 1829, 1830 and 1831*, mentions that the name Kengal was used by the Wiradjuri people to describe the mountain known today as The Rock. The name of the walking track, Yerong, is borrowed from the creek of the same name to the south and is corrupted form the Wiradjuri word "yirrang" or "irang" meaning teeth.

The Rock Nature Reserve lies within the Wagga Local Aboriginal Land Council area of the Wiradjuri Regional Aboriginal Land Council.

Policies

- * All Aboriginal sites located will be recorded and an assessment made of each site's significance and threats to its long term preservation.
- * All Aboriginal sites will be protected as far as possible from disturbance or deterioration by human activities.
- * The Service will liaise with the Wagga Local Aboriginal Land Council and other interested Aboriginal persons on all aspects of Aboriginal site management.
- * All works proposed for the nature reserve will be preceded by a survey for Aboriginal sites.

- * Non-destructive research into past Aboriginal use of the area will be encouraged.
- * The location of Aboriginal sites will not be publicised except where an assessment of their significance has been undertaken and works implemented if necessary to protect the site or sites from damage.
- * The provisions of the Australia ICOMOS Charter for the conservation of places of cultural significance (The Burra Charter) will guide management decisions for any Aboriginal sites found in The Rock Nature Reserve.

Actions

- * Aboriginal sites will be progressively recorded and conservation assessments will be prepared where necessary. Priority will be given to sites at risk from visitor impact or natural destructive processes.

4.2.2 Historic Places

The first Europeans to sight the elevation known today as The Rock was the exploration party of Captain Charles Sturt. Sturt writes:

“ Sunday, December 7th:

Passed at the base of some small hills shortly after leaving our encampment, the last of the elevations to the Westward - Altho' of no great height, the view from them was extensive and enabled me to keep up my bearings. There was a broken and lofty country to the E.S.E. while to the North East and North it was comparatively flat, but from the last point to the Westward the eye wandered over woodland alone, if I except a solitary hill that bore by compass S 53 W. At about 12 miles distance, and a remarkable Mountain (Kengal) bearings S 32 W-- travelled about ten miles on a W by N Course and halted on the Banks of the River.....”.

The “Hanging Rock” run was first taken up by Dr. James E. Wall in 1849 for an area of about 60,000 acres. Some time between 1849 and 1863 the station changed hands, and Mrs S. Brown took over an area of 25,600 acres. (Goode, 1962).

In 1862 the area was surveyed and from this time on the Rock and its immediate surroundings have been crown reserve. The “Hanging Rock Run” later known as the Rock Estate, was broken up and sold in 1911 into 47 blocks ranging in area from 68 to 500 acres.

Quarrying began on The Rock's lower slopes in 1891 and continued until the 1940s. Topsoil was stripped from the area and gravel road base material was quarried to provide ballast for the Sydney-Melbourne rail line.

The early white settlers called the hill “Hanging Rock”, but it was still called “Kengal” on a map of 1863. On an 1867 map it appears as Hanging Rock, 1880 has it as “Yerong Trig Station, 1817ft”. (Goode, 1962).

The name Hanging Rock was derived from the fact that there was a large boulder perched on the eastern face of the hill, which fell in about 1874 cutting a swathe through the timber on the eastern side of the hill. Pieces of this rock, some quite large, can still be seen. The local township clung to the first European name until 1918 when, because there was no longer anything ‘hanging’, the place name was officially changed to The Rock. (Goode, 1962)

Policies

- * All ground disturbance within the vicinity of historic places will be preceded by an archaeological survey.
- * Research into the history and archaeology of land settlement in the area will be encouraged.
- * The provisions of the Australia ICOMOS Charter for the conservation of places of cultural significance (The Burra Charter) will guide management decisions for any historic places in The Rock Nature Reserve.

Actions

- * A survey will be undertaken to identify any sites of historic significance and conservation assessments will be prepared where necessary.

4.3 USE OF THE NATURE RESERVE

The Rock Nature Reserve will be managed to ensure that use, whether by the general public, special interest groups, Service managers or other authorities, is appropriate and conforms with the management objectives and strategy of this plan.

The major categories of use that may be appropriate within Service areas are:

- * promotion of natural and cultural heritage conservation;
- * environmental education;
- * recreation in a natural setting;
- * scientific research; and
- * management operations by the Service and other authorities.

The extent to which these categories of use are appropriate to The Rock Nature Reserve are indicated in the following sections.

4.3.1 Promotion and Public Use

The primary purpose of nature reserves is the conservation of the natural and cultural environment. Educational use, nature study and recreational pursuits are also appropriate provided they do not conflict with conservation. The reserve is one of the few areas of natural bushland close to Wagga Wagga and has historically been a recreational resource for the local community. Activities currently undertaken in the reserve include picnicking, bird watching, rock climbing, abseiling, orienteering and bush walking.

The provision of information on the natural and cultural features of the reserve and the recreational opportunities available enhances visitors appreciation and enjoyment of the reserve. A new pamphlet promoting the reserve has recently been produced by the Service and is available at various locations within the District.

Visitation

Limited research has been undertaken to establish the number of visitors to The Rock Nature Reserve. However, while overall visitor numbers are believed to be low, on fine weekends and during school holiday periods, the visitor facilities in the reserve are often fully utilised. The capacity of semi-arid environments to sustain moderate levels of visitor use is low because of the dry climate and subsequent low growth rate of vegetation. The Service will therefore not seek to increase use of the area.

A visitor survey undertaken in 1986 identified a number of inadequacies with the current facilities (Clark, 1986). The Yerong walking track was identified as requiring maintenance, visitors requested increased sign posting and complained of the lack of interpretation, some of the picnic area facilities required maintenance and upgrading and the need for an alternative walking track was also identified. These inadequacies are being progressively addressed.

Occasional overnight camping is occurring at the reserve. Camping will not be permitted at the reserve and suitable signage will be erected to notify users. Limited horse riding occurs in the reserve. Horse riding is not appropriate because of the potential for erosion and weed introduction.

There has been some vandalism of Service signs and bollards at the reserve including the removal and burning of wooden posts. Minor vandalism has also occurred to the toilets and picnic shelter. All damaged facilities will be promptly replaced or maintained to discourage further acts of vandalism.

Facilities

The following day use facilities are provided in the reserve: barbecues, a group picnic shelter and individual picnic tables, toilets, town water, garbage bins, a car park and the Yerong walking track.

The picnic area will be redesigned to reduce erosion, increase vegetation, provide a setting that allows a better appreciation of the surrounding environment and provides a more attractive and useable facility. Planned improvements to the picnic facilities include the addition of a spring loaded tap, replacement of barbecues and picnic tables, and the replacement of some of the corrugated iron roofing panels on the toilet block with clear panels to improve lighting into these areas. Interpretation will also be improved.

Firewood is currently supplied at the picnic area by staff from Lockhart Shire Council. However, the provision of wood barbecues encourages visitors to collect wood from the surrounding area and damage trees, impacting on conservation values in this small reserve. The provision of gas/electric barbecues will be investigated to discourage this practice.

Access Within the Reserve

The access road and carpark have been upgraded and Lockhart Shire Council is upgrading directional signs on the roads approaching the reserve. Some unauthorised vehicle use is occurring on the fire trail by both 4WDs and trail bikes. Recent measures have been undertaken to prevent 4WD access to the trail, however previous barriers have been destroyed and removed and this may be an ongoing problem. Trail bikes are also using the old track to the northern rock face and some off-road use is also occurring. Barriers around the carpark area may need to be extended to prevent vehicles gaining access to trails from this area.

The Yerong walking track is a 3 km walk which rises 250m above the surrounding countryside. The track is gentle on the lower slopes of The Rock, however at higher levels the gradient is steep and strenuous. The walk takes approximately 3 hours to complete.

On the lower slopes, the walk follows the fire trail for the first 1.5km. The walking track skirts the old gravel quarry area before winding uphill. Due to poor directional signage, many walkers take the wrong turn and try to reach the summit from the quarry. There are old management tracks found in the quarry area and "goat tracks" which are kept open by walkers. New directional signage will direct walkers to the trail to minimise erosion and damage to vegetation.

Recent works have been carried out along the Yerong walking track including the construction of approx 60 steps and associated drainage. Further upgrading is still required along the walking trail, particularly in the steeper sections. Where the walking track zig zags up the steep slope a proliferation

of short cuts have become established causing erosion and loss of vegetation. Some of these areas require stabilisation, fencing and revegetation works.

The old numbered sign posts constructed as part of a self guided walk still exist along the trail, even though the associated interpretation material is no longer available. A number of users have expressed confusion over these signs. The posts need to be removed and alternative interpretation placed along the track.

At present no shorter walking tracks are supplied within the reserve. The majority of visitors surveyed by Clark (1986) identified the need for a shorter walk, preferably close to the picnic area. The Service will investigate possible routes for a shorter, easier walk in order to cater for the range of user abilities.

A walking track to the north-eastern rock face begins 50m from the car park. This track is used by rock climbers to reach the main climbing face. The track is part of the old walking loop and is well defined up to 20m from the NE rock face. This track will not be promoted as a walk for general use due to the possible conflict and safety issues arising between walkers and rockclimbers. Along the rock face and climbing to the ridge the track becomes less defined and erosion is apparent especially in the “descent gully” used by rockclimbers to descend from the cliff face.

Orienteering

In recent years orienteering has been carried out once per year at The Rock Nature Reserve by the Waggaroos Orienteers with the number of participants not exceeding 50. Orienteering is of concern because the impacts from this activity may occur over a fairly large area of the reserve, particularly trampling of plants. Only one orienteering event will be permitted each year in the reserve and orienteering events will not be permitted during the Peregrine Falcon breeding season between July and December. The activity will be monitored and may be prohibited in future if unacceptable impacts are indicated in accordance with Service policy. The use of spiked runners will not be permitted in the reserve, nor will courses be permitted which will lead to orienteers traversing the upper scree slopes where populations of *Senecio garlandii* are found.

Rock Climbing and Abseiling

Rock climbing and abseiling are currently undertaken at the north-east rockface facing the picnic area, known locally as the “Towers”. This is the only cliff area that is stable enough to be used for rock sports and it covers about 100m of cliff face. This is the only area where rock sports will be permitted and the site will be actively managed for such activities.

Rock sports have environmental impacts such as the dislodgment of rock, the placement of bolts and disturbance to vegetation and nesting birds. Safety

measures to eliminate conflict with other user groups and environmental protection measures need to be introduced if rock sports are to continue within the reserve.

A track leads to the "Towers" which becomes indistinct as it nears the cliff face and continues on to the "descent gully". The base of the cliff face consists of loose rock which may be difficult to stabilise and there is evidence of vegetation trampling. Erosion is occurring in the "descent gully" which is used by climbers to descend from the ridge. Options for site hardening and modification of rock climbing practices will be investigated to assist with erosion control and to minimise vegetation damage both at the base of the cliff and in the "descent gully". Users will be encouraged to descend via the rockface to minimise damage to the environment.

A recent survey conducted to determine the distribution of *Senecio garlandii* at The Rock Nature Reserve found that "with such a coverage there is no possibility of abseilers and rock climbers avoiding affecting at least some plants either at the top or at the bottom of the cliffs. In fact one plant was observed perched on the cliff just above a painted sign marking the start of a climbing route" (Whiting, 1997). The main population of *S. garlandii* is found at the base of the south-eastern cliffs and scree slopes of The Rock. *Senecio garlandii* also occurs near the rock sports area although few plants occur at the base of the cliff face, probably due to disturbance from rock climbers and abseilers. The significance of this impact on the *S. garlandii* population is thought to be minimal. Users of the rock sports area will be educated in identification of *S. garlandii* to prevent trampling and damage to the plants.

Evidence suggests that the abandonment of Peregrine Falcon nesting sites can occur as a result of the presence of rock climbers, especially during the early stages of nesting. Peregrine Falcons have been observed nesting at the reserve on the south-east rock face, not far from the Yerong walking track, approximately 1km from where rock sports occur. At present, rock sports are not interfering with breeding Peregrine Falcons. Monitoring will be conducted to ascertain if the falcons nest in or near the rock sports area in subsequent years. If so, a closure for rock sports between 1st of July and 31st of December will be imposed.

New climbs are not to be established outside the designated rock sports area. In the past, the beginning of climbs have been marked on the rockface with paint. This practice will not be allowed, climbs should be described in the appropriate literature. The use of permanent anchors (eg bolts) will not be allowed for rock climbing and "traditional" climbing practices using "natural protection" (ie removable gear) will be utilised by rock climbers and abseilers. Regulatory signage and literature will be developed to educate rock climbers and abseilers about their responsibilities when using the reserve. Environmental impacts associated with rock sports will be assessed and monitored so that policies regarding rock sports can be modified if unacceptable environmental impacts occur.

A code of conduct for rock sports in the reserve and a separate policy/permit system for group and commercial activities will be developed in consultation with stakeholders. Larger commercial/recreational groups have the capacity to cause greater environmental damage than individual climbers. Limits on party sizes will be a maximum of 4 for rock climbing parties and 8 for abseiling parties. These limits will be reviewed in consultation with user groups and having consideration to the Service's Adventure Recreation policy and standards in other Service areas. The review may result in an amendment to this plan.

Policies

- * Understanding and appreciation of the natural and cultural values of the reserve will be promoted to increase public appreciation and encourage sympathetic management of adjacent lands.
- * Appropriate recreational use, such as bush walking and rock climbing, may be permitted where it will not cause damage to the reserve's conservation values or a burden on management.
- * Vehicle use by visitors will only be permitted on the small section of formed road leading to the picnic area.
- * Opportunities for the creation of a short to medium distance walking track will be investigated to offer an alternative to the strenuous Yerong walking track. This will not be routed through the habitat of the endangered *Senecio garlandii*.
- * Detailed resource information will be available for educational groups and interested visitors.
- * Horse riding will not be permitted on the reserve.
- * Overnight camping will not be permitted in the reserve.
- * Any vandalised facilities will be repaired or replaced as soon as management permits to discourage any further acts of vandalism.
- * One orienteering event may be held each year in the reserve but not during the Peregrine Falcon breeding season between July and December. The activity will be monitored and may be prohibited in future if unacceptable impacts are indicated. The use of spiked runners will not be permitted in the reserve nor will courses traverse the upper scree slopes where populations of *Senecio garlandii* are found.
- * Activities such as abseiling and rock climbing will be subject to safety standards and environmental protection requirements.

- * Rock climbing will only be permitted on the north-east or picnic shelter rock face also known as the "Towers" i.e. 100m of cliff line facing the picnic area.
- * The marking of climbs and permanent fixtures such as bolts on the rockface will not be permitted.
- * No new climbs are to be established outside of the designated rock sports area.
- * Limits on party sizes will be a maximum of 4 for rock climbing parties and 8 for abseiling parties. These limits will be reviewed in consultation with user groups and having consideration to the Service's Adventure Recreation policy and standards in other Service areas.

Actions

- * Further upgrading of the day use facilities will be undertaken. New tables and barbecues will be provided.
- * The construction and maintenance of additional barriers will be undertaken to stop unauthorised use of the fire trail and off-road access.
- * The Yerong walking track will be upgraded and where necessary revegetation works will be undertaken to rehabilitate the eroded areas surrounding the track.
- * Current signage within the reserve will be reviewed and a program for the upgrading of both directional and interpretive signs will be implemented.
- * The creation of a short walking track close to the picnic area will be investigated and if constructed, interpretation will be provided.
- * A system of basic visitor use monitoring will be implemented in the reserve.
- * Users of the rock sports area will be educated in identification of *S garlandii* to prevent trampling and damage to the plants
- * A bolt for abseiling descent from the Towers will be established and climbers and abseilers encouraged to use this instead of the descent gully.
- * Options for site hardening and modification of rock sport practices will be investigated to assist with erosion control and to minimise vegetation damage.

- * Appropriate signage and literature will be developed to educate rock climbers and abseilers about appropriate practices.
- * A code of conduct for rock climbing and abseiling, and a separate policy/permit system for group and commercial activities, will be developed in consultation with stakeholders.
- * Monitoring of falcon nesting sites will be undertaken and if they occur in or near the rock sports area a closure for rock sports between 1st of July and 31st of December will be imposed.
- * Environmental impacts associated with rock sports will be assessed and monitored so that policies regarding rock sports can be modified if unacceptable environmental impacts occur.

4.3.2 Scientific Research

The purpose of scientific study in the reserve is to improve the understanding of its natural and cultural heritage and the processes which affect them. Research will also establish the requirements for the management of particular species. Data and findings from research studies and surveys will be utilised in reserve management.

There has been one scientific licence granted for research in The Rock Nature Reserve in recent years. The research involved the production of a species list and a vegetation map for the reserve by Geoff Burrows. Geoff Burrows has also undertaken research into the Post-fire regeneration and growth of *Senecio garlandii* following the 1991 bush fire in the reserve.

The Service does not presently have the resources to undertake any long term research in the reserve. The continued use of the reserve for research by students from Charles Sturt University as part of the BAS Parks, Recreation and Heritage will be encouraged.

Policies

- * Priority will be given to research into vulnerable and endangered species, particularly :
 - the distribution, population size and management status of *Senecio garlandii* ; and
 - the population dynamics and conservation status of the Turquoise Parrot.
- * Service conducted research will aim to provide information on the natural and cultural heritage, and on human use to facilitate management of the reserve.

- * All research will be subject to Service policy and procedures for the granting of permits, conduct of research and the production of results.
- * Research applications will only be granted where;
 - the research has the potential to facilitate the better management of the reserve; and
 - the research does not conflict with the objectives of reserve management.

Actions

- * A prospectus will be prepared as a guide to preferred research projects in the reserve. Preferred topics will be those of direct relevance to management and will include;
 - additional surveys of native animals;
 - the protection of rare plants;
 - the impact of fire on the native plants and animals of the reserve;
 - the changing incidence of fire in the reserve arising from changes to landuse in surrounding areas;
 - the control of non-native plants and animals
 - the recording of cultural sites and the identification of potential threats; and
 - the impact of visitors on the reserve.

4.3.3 Management Operations

Management of the reserve is under Griffith office within the Western Region of the State. The distance of The Rock Nature Reserve from the Griffith office makes on-site management difficult, and therefore the establishment of a "Friends of The Rock Nature Reserve" to assist in management will be investigated.

The Reserve is located within the boundaries of Lockhart Shire. Rubbish bins are provided at the picnic area and rubbish removal from the reserve is contracted to the Shire.

Sewage disposal in the reserve is by a septic tank system. The reserve is attached to the town water supply and a tap is provided in the picnic area.

Cleaning of the toilet block and general maintenance of the picnic area is also contracted to Lockhart Shire.

The reserve contains a short public access road to the day use facilities and a management track used for fire control along the northern and eastern boundaries of the reserve. No fire trails are constructed on the other boundaries due to the topography. The management track system is shown on the map, centre pages.

The reserve boundaries are fully fenced.

Policies

- * The public access road to the picnic area and the management track shown on the map, centre page, will be maintained to a satisfactory standard of access, safety and stability.
- * Management facilities may be upgraded as necessary.
- * Materials may be provided to neighbours for stock proof boundary fencing where appropriate.
- * Only permit authorised use of the management track.

Actions

- * Vehicle use for management purposes will, as far as possible, be confined to the existing fire trail.
- * Management facilities and the trail will be maintained and where necessary upgraded in a manner consistent with the objectives and policies outlined in this plan of management.
- * The eastern boundary fence will be upgraded.
- * The day use facilities will be replaced and upgraded with the standard design used in the other District reserves.
- * The establishment of a "Friends of The Rock Nature Reserve" will be investigated.
- * The need for a stock grid on the front entrance will be investigated and a grid installed if required.

5. PLAN IMPLEMENTATION

This plan of management is part of a system of management developed by the National Parks and Wildlife Service. The system includes the National Parks and Wildlife Act, management policies, established conservation and recreation philosophies, and strategic planning at corporate, regional and district levels.

The orderly implementation of this plan will be undertaken within the annual programs of the Service's Griffith District. Priorities, determined in the context of district and regional strategic planning, will be subject to the availability of necessary staff and funds and to any special requirements of the Director-General or Minister.

District programs are subject to ongoing review, within which, works and other activities carried out at The Rock Nature Reserve are evaluated in relation to the objectives laid out in this plan.

The environmental impact of all development proposals will continue to be assessed at all stages of the development and any necessary investigations undertaken in accordance with established environmental assessment procedures.

In accordance with Section 81 (4) of the National Parks and Wildlife Act, 1974, and notwithstanding anything in that Act or any other Act or in any instrument made under that or any other Act, no operations can be undertaken within The Rock Nature Reserve except in accordance with this plan.

No term is proposed for this plan of management. If, after adequate investigation, operations not included in this plan are found to be justified, either for the purpose of conserving the reserve's resources or for their use, this plan will be amended in accordance with Section 75 (8) and (9) of the Act.

As a guide to the orderly implementation of this plan, relative priorities for identified activities are summarised below:

Actions	Plan Section	Priority
Undertake erosion control and restoration works on the Yerong walking trail	4.1.1	High
Erect signs to direct the public away from sensitive or unstable areas	4.1.1	High
Determine the need for erosion control measures on the fire trail	4.1.1	Medium

Actions	Plan Section	Priority
Assess need for remedial work on the gravel quarry areas and “descent gully”	4.1.1	Low
Encourage research into the reserve’s ecology	4.1.2	Ongoing
Monitor key vegetation communities	4.1.2	Ongoing
Map and a monitor the distribution of <i>Senecio garlandii</i>	4.1.2	High
Undertake comprehensive fauna survey	4.1.3	Medium
Encourage sympathetic management of neighbouring lands for wildlife conservation	4.1.3	Ongoing
Undertake annual control of Paterson’s curse, horehound and any other noxious species	4.1.4	Ongoing
Control rabbits, goats, foxes, cats and pigs where practical and environmental damage is occurring	4.1.4	Ongoing
Map and assess impacts of introduced species	4.1.4	Low
Undertake chemical control of Paterson’s curse	4.1.4	Low
Review current fire management practices and prepare fire management plan for the reserve	4.1.5	High
Close and rehabilitate temporary trails, helipads and firelines as part of post fire operations.	4.1.5	Ongoing
Maintain records of fire occurrence	4.1.5	Ongoing
Maintain existing fire trails	4.1.5	Ongoing
Survey Aboriginal sites	4.2.1	Medium
Survey historic sites	4.2.2	Medium
Upgrade day use facilities and provide New tables and BBQs	4.3.1	Medium
Construct additional barriers to stop unauthorised use of the firetrail	4.3.1	High

Actions	Plan Section	Priority
Upgrade Yerong walking track and Undertake revegetation	4.3.1	High
Review signage and implement a program for upgrading signs	4.3.1	Medium
Investigate short walking track and if constructed provide interpretation	4.3.1	Medium
Implement visitor use monitoring	4.3.1	Medium
Develop a code of conduct for rock climbing and abseiling, and a policy/permit system for group and commercial activities	4.3.1	High
Educate users of the rock sports area In identification of <i>S garlandii</i>	4.3.1	High
Develop appropriate signage and literature to educate rock climbers and abseilers about appropriate practices	4.3.1	High
Establish a bolt for abseiling descent from the Towers	4.3.1	High
Investigate options for site hardening to assist with erosion and vegetation damage.	4.3.1	Medium
Monitor falcon nesting sites	4.3.1	Ongoing
Monitor and assess environmental impacts associated with rock sports	4.3.1	Ongoing
Prepare prospectus of preferred research projects	4.3.2	Low
Maintain management track and facilities	4.3.3	Ongoing
Fence eastern boundary	4.3.3	Medium
Replace and upgrade day use facilities	4.3.3	High
Investigate need for a stock grid at front entrance	4.3.3	Low

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