# **CUUMBEUN NATURE RESERVE**

# **PLAN OF MANAGEMENT**

**NSW National Parks and Wildlife Service** 

Part of the Department of Environment and Conservation (NSW)

May 2006

This plan of management was adopted by the Minister for the Environment on 31<sup>st</sup> May 2006.

#### Acknowledgments

This plan of management is based on a draft plan prepared by staff of the South West Slopes Region of the National Parks and Wildlife Service (now part of the Department of Environment and Conservation NSW).

Cover photographs by David Leigh and Andrew Moore, NPWS.

The NPWS acknowledges that this nature reserve exists within Ngunnawal Country and the Ngunnawal Local Aboriginal Land Council boundary.

Inquiries about this draft plan of management should be directed to the NPWS Queanbeyan Area Office, 6 Rutledge St, Queanbeyan NSW 2620 or by telephone on 62992929.

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### FOREWORD

Cuumbeun Nature Reserve is located in the southern tablelands of NSW, approximately three kilometres east of Queanbeyan. It comprises two parcels of land totalling 709 hectares, located on the escarpment to the east of the Queanbeyan valley.

Cuumbeun Nature Reserve is dominated by a dry sclerophyll forest of scribbly gum, long-leaved bundy, red stringybark, brittle gum and red box. The undulating valley floors support a woodland with an abundance of yellow box and a grassy understorey, a community listed as an endangered ecological community under the *Threatened Species Conservation Act, 1995.* Archaeological surveys of the reserve have found indications of past Aboriginal use, including a number of artefact scatters.

Much of the reserve has been cleared for pastoral use and was occupied under annual grazing permits until recently. Its location in an area of high population and previous unregulated access has resulted in heavy recreational use by damaging activities and other inappropriate uses such as firewood collection and rubbish dumping. Management of Cuumbeun Nature Reserve will focus on the rehabilitation of environmental damage resulting from previous public use of the reserve.

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

A draft plan of management for Cuumbeun Nature Reserve was placed on public exhibition from 25<sup>th</sup> February until 30<sup>th</sup> May 2005. The exhibition of the draft plan attracted 10 submissions that raised 9 issues. All submissions received were carefully considered before adopting this plan.

This plan of management establishes the scheme of operations for Cuumbeun Nature Reserve. In accordance with Section 73B 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. MANAGEMENT CONTEXT

#### 1.1 LEGISLATIVE AND POLICY FRAMEWORK

The management of nature reserves in NSW is in the context of a legislative and policy framework, primarily the *National Parks and Wildlife Act 1974* (NPW Act), the NPW Regulation, the *Threatened Species Conservation Act 1995* and the policies of the National Parks and Wildlife Service (NPWS). Section 72AA of the NPW Act lists the matters to be considered in the preparation of a plan of management. The policies arise from the legislative background and internationally accepted principles of park management. They relate to nature conservation, Aboriginal and historic heritage conservation, recreation, commercial use, research and communication.

Other legislation, international agreements and charters may also apply to management of the area. In particular, the *Environmental Planning and Assessment Act 1979* requires the assessment and mitigation of the environmental impacts of any works proposed in this plan.

The plan of management is a statutory document under the NPW Act. Once the Minister has adopted a plan, no operations may be undertaken within Cuumbeun Nature Reserve except in accordance with the plan. The plan will also apply to any future additions to Cuumbeun Nature Reserve. Where management strategies or works are proposed for the nature reserve or any additions that are not consistent with the plan, an amendment to the plan will be required.

# 1.2 MANAGEMENT PURPOSES AND PRINCIPLES

Nature reserves are reserved under the NPW Act to protect and conserve areas containing outstanding, unique or representative ecosystems, species, communities or natural phenomena.

Under the Act, nature reserves are managed to:

- conserve biodiversity, maintain ecosystem functions, and protect geological and geomorphological features and natural phenomena;
- conserve places, objects, features and landscapes of cultural value;
- promote public appreciation, enjoyment and understanding of the reserve's natural and cultural values; and
- provide for appropriate research and monitoring.

Nature reserves differ from national parks in that they do not have as a management principle to provide for visitor use.

# **1.3 REGIONAL FOREST AGREEMENTS**

Regional Forest Agreements (RFAs) are one of the principle means of implementing the National Forest Policy Statement of 1992. Under this Statement Commonwealth, State and Territory governments agree to work towards a shared vision for Australia's forests. This aims to maintain native forest estate, manage it in an ecologically sustainable manner and develop sustainable forest-based industries.

The Statement provided for joint comprehensive assessments of the natural, cultural, economic and social values of forests. These assessments formed the basis for negotiation of Regional Forest Agreements that provide, amongst other things, for Ecologically Sustainable Forest Management.

The Southern Region Regional Forest Agreement of 2000 covers the planning area. The process leading up to the RFA provided for major additions to the reserve system, including the establishment of Cuumbeun Nature Reserve.

#### **1.4 MANAGEMENT DIRECTIONS**

Management of Cuumbeun Nature Reserve will focus on the rehabilitation of environmental damage resulting from previous public use of the reserve.

Reserve Map Soupping HWY KINGS Queanbeyan POWELLOR OLD SYDNEY RD Flot Ck CAPTAINS FLAT RD WANNA WANNA RD Cuumbeun Nature Reserve Wanna Wanna Nature Reserve QUEANBEYAN RIVER WICKERSLACK L Cuumbeun Nature Reserve Cuumbeun Nature Reserve Roads Management Trail Deep Ck Main Road Minor Road Trail Other Features River/Creek NPWS Estate Urban Area

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#### 2. CUUMBEUN NATURE RESERVE

#### 2.1 LOCATION, GAZETTAL AND REGIONAL SETTING

Cuumbeun Nature Reserve is located in the southern tablelands of NSW, approximately three kilometres east of Queanbeyan.

The nature reserve was gazetted as part of the Southern Regional Forest Agreement in 2001, and comprises two parcels of land totalling 709 hectares. The reserve's name was selected in consultation with the Ngunnawal Local Aboriginal Land Council; Cuumbeun being the name for the area from which the name Queanbeyan is possibly derived.

The reserve is located close to the boundary of the urban areas of Queanbeyan to the west, and is within a largely rural residential area, administered by the Queanbeyan City Council.

Also included in the planning area are several roads that are vested in the Minister for the Environment on behalf of the Crown for the purposes of Part 11 of the NPW Act. These roads do not currently form part of the gazetted area of the park. They were created by the *National Parks Estate (Southern Region Reservations) Act* 2000 (NPE Act) to ensure that essential access arrangements which existed immediately before the park additions could continue. The NPE Act provides that, following assessment, these roads must be either added to the park or excluded from the park.

#### 2.2 LANDSCAPE

Natural and cultural heritage and on-going use are strongly inter-related and together form the landscape of an area. Much of the Australian environment has been influenced by past Aboriginal and non-Aboriginal land use practices, and the activities of modern day Australians continue to influence bushland through recreational use, cultural practices, the presence of introduced plants and animals and in some cases air and water pollution.

Cuumbeun Nature Reserve protects an area of remnant native vegetation within a highly disturbed landscape.

The geology, landform, climate and plant and animal communities of the area, plus its location, have determined how it has been used by humans. Clearing, grazing and impacts from past recreational activities are all activities that have shaped the reserve, and indeed the surrounding region, and have lead to the landscape that exists today.

Both Aboriginal and non-Aboriginal people place cultural values on natural areas, including aesthetic, social, spiritual, recreational and other values. Cultural values may be attached to the landscape as a whole or to individual components, for example to plant and animal species used by Aboriginal people. This plan of management aims to conserve both natural and cultural values. For reasons of clarity and document usefulness natural and cultural heritage, non-human threats and on-going use are dealt with individually, but their inter-relationships are recognised.

#### 2.3 NATURAL HERITAGE

#### 2.3.1 Landform, Geology and Soils

The reserve is located on the escarpment to the east of the Queanbeyan valley. The southern section of the reserve occupies the western fall of the escarpment, with an altitudinal range from 580 to 840 metres. The northern section of the reserve is located generally on the top of the escarpment with an altitudinal range from 720 to 780 metres.

The reserve is located just to the east of the Queanbeyan fault line. The basement rocks consist of undifferentiated Ordovician deep water sediments and include greywackes, sandstones, shale, chert, limestone and quartzite. In addition, on the western boundary of the southern portion of the reserve outcrops of the Middle Silurian Fairbairn Group and Colinton Volcanics are found. These rocks were deposited in a shallow water environment and consist of dacites, tuffs, shales, sandstones and limestone. Soils across the reserve are generally skeletal with deeper soils occurring in small areas on the plateau top and in some drainage lines.

A number of small incised gullies flow out of the reserve to the west, into the Queanbeyan River. Scabbing Flat Creek (refer to map, page 3), the largest creek system within the reserve, flows through the northern section of the reserve into the Molonglo River to the north.

#### 2.3.2 Native Plants

The reserve is dominated by dry sclerophyll forest of scribbly gum *E. rossii*, long-leaved bundy *E. nortonii*, red stringybark *E. macrorhyncha*, brittle gum *E. mannifera* and red box *E. polyanthemos*. The understorey consists of red-anther wallaby grass *Joycea pallida* interspersed with numerous forbs. A sparse shrub layer includes box-leaved wattle *Acacia buxifolia* ssp *buxifolia*, austral indigo *Indigofera australis*, five corners *Styphelia triflora* and a bush-pea *Pultenaea procumbens*.

Within the southern section of the reserve, steeper sheltered slopes on the western fall of the escarpment support red stringybark, long-leaved bundy and yellow box *E. melliodora* with a *Poa* tussock understorey. Deeper soils in sheltered gorges support an open forest of red stringybark and apple box *E. bridgesiana,* with a shrub layer of *Kunzea* and black wattle *Acacia mearnsii* and a herb grass ground layer.

Undulating valley floors with deeper soils on the escarpment support apple box, yellow box and red stringybark, with a herb grass understorey. Low shrubs occurring in this type include cotton fireweed Senecio quadridentalis, urn heath Melichrus urceolaris and creeping Bossiaea Bossiaea prostrata. Dominant grasses include Austrodanthonia spp. and wheat grass Elymus scaber. Significant forbs include hoary sunray Leucochrysum albicans subsp. albicans var. tricolor, rough burr-daisy Calotis scabiosifolia var integrifolia and common everlasting Chrysocephalum apiculatum. This community, with an abundance of yellow box and a grassy understorey, is listed as an endangered ecological community under the Threatened Species Conservation Act, 1995. Leucochrysum albicans subsp. albicans var. tricolor is listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999.

Compared with management of forested areas, management of the grassy woodland may have a higher emphasis on control of understorey biomass and control of weeds and exotic pasture plants to maintain understorey integrity.

## 2.3.4 Native Animals

Native mammals recorded in the reserve include the eastern grey kangaroo *Macropus giganteus*, swamp wallaby *Wallabia bicolor*, sugar glider *Petaurus breviceps*, ringtail possum *Pseudocheirus peregrinus*, brushtail possum *Trichosurus vulpecula*, agile antechinus *Antechinus agilis* and echidna *Tachyglossus aculeatus*. Eight species of bats have also been recorded in the reserve, including the eastern false pipestrelle *Falsistrellus tasmaniensis* which is listed as vulnerable under the Threatened Species Conservation Act. A koala *Phascolarctos cinereus*, also listed as vulnerable under the Threatened Species Conservation Act, has been recorded on land adjoining the reserve and koala populations have also been recorded in similar habitat nearby.

The reserve has abundant birdlife with over 45 species being recorded to date, including the leaden flycatcher *Myiagra rubecula*, olive-backed oriole *Oriolus sagittatus* and spotted quail-thrush *Cinclosoma punctatum*. A number of threatened bird species that inhabit box woodland have been recorded in the vicinity of the reserve, including the hooded robin *Melanodryas cucullata*, speckled warbler *Pyrrholaemus saggitata* and diamond firetail *Stagonopleura guttata*.

Five species of skink and three species of dragons have also been recorded, as well as two species of snakes. Of significance is the presence of Rosenberg's goanna *Varanus rosenberg*, listed as vulnerable under the Threatened Species Conservation Act.

# 2.4 CULTURAL HERITAGE

# 2.4.1 Aboriginal Heritage

The reserve is located in an area thought to be on the fringe of lands occupied by the Ngunawal, Ngarigo and Wolgal people (Tindale, 1974). Today the reserve lies within the area of the Ngunnawal Local Aboriginal Land Council.

Archaeological surveys of the reserve have found indications of past Aboriginal use, including a number of artefact scatters. The most common artefact types were flakes, followed by lithic fragments. A small number of other artefact types were found. Aboriginal sites varied in size from a single artefact to 37 artefacts. The area of highest archaeological importance appears to be in the north-eastern sector of the reserve. This is probably due to the presence of water, in the form of Scabbing Flat Creek, and the nearby Molonglo River (Dearling, 2002).

Dearling (2002) stated that more sites may be located within the reserve and identified the following criteria for predicting the distribution of Aboriginal sites in the local landscape:

- open campsites will be located near streams, especially on elevated level ground and low gradient basal slopes;
- large open campsites will occur more frequently within 100-150m of major drainage lines, with a preference for areas at the confluence of major streams;
- open artefact scatters that occur away from creeks will tend to be small and sparse;

• scarred trees may occur wherever old growth trees of sufficient age are present.

#### 2.4.2 Non-Aboriginal Heritage

Much of the reserve has been cleared for pastoral use, and was occupied under annual grazing permits until recently. Part of the reserve was also a temporary common in the late 1880's. The remains of an old stone fireplace are located in the southern section of the reserve. This may date back to the early 1930's when the land was first utilised under a permissive occupancy. (Smith, 2003).

## 2.5 THREATS TO THE NATURE RESERVE

#### 2.5.1 Fire

Fire is a natural feature of many environments and is essential to the survival of some plant communities. Inappropriate fire regimes, however, can lead to loss of particular plant and animal species and communities. Fire can also damage cultural heritage, recreation and management facilities and can threaten visitors and neighbouring land.

There have been three recorded wildfires within the reserve since 1984. The last significant wildfire event occurred in 1985, when two fires originating outside the reserve burnt 550 ha of the nature reserve.

In February 1985, an ignition on the Canberra-Sydney railway line burnt a total of 554 ha, of which 160 ha were in the north-eastern corner of the reserve. The Googong fire of March 1985 burnt 1880 ha, including 390 ha of the reserve. All of the southern section and the south-western half of the northern section of the reserve, west of the Captains Flat Road, was burnt. In October 2001 a small fire burnt 4 ha of the reserve.

There is a considerable concentration of assets adjoining the northern sector of the reserve on the eastern side. Fuel loads for the scribbly gum – long-leaved bundy – tussock grass community which adjoins these lands averaged at 14.4 t/ha in March 2003. As this was at the end of summer at the peak of the extended drought, when minimal decomposition of litter had occurred for a long period of time, these loads would represent maximum fuel levels for this vegetation. The heaviest fuel load recorded was 18.2 t/ha, which included 6.0 t/ha of grass fuel, reflecting the dominance of red-anther wallaby grass in the understorey. Very little shrub loading was present. Rural Fire Service guidelines recommend fuel loadings be maintained at between 8 and 15 tonnes per hectare for 60-80% of strategic fire management zones, which lie generally within 500 metres of assets. Reserve fuel levels measured under peak loads fall within this range.

The Service maintains cooperative arrangements with surrounding landowners and Rural Fire Service (RFS) brigades and is actively involved in the Lake George Zone Bushfire Management Committee. Cooperation includes approaches to fuel management, support for neighbours fire management efforts and information sharing.

Research conducted in similar dry sclerophyll forest in the region (Doherty, 1997) suggests that, in general, a long fire interval of up to 100 years is beneficial for floral biodiversity in this vegetation type. Strategic burning of smaller portions of the reserve for asset protection may, however, be undertaken at shorter intervals.

#### 2.6 USE OF THE RESERVE

The reserve provides an important resource for people, particularly those from Queanbeyan and adjoining rural residential areas, to enjoy, appreciate and understand the natural environment. However, due to its small size, fragmented nature and erodible soils, the reserve is susceptible to degradation by inappropriate or excessive use.

Due to its location in an area of high population and previous unregulated access the reserve has been subject to heavy use in recent years. Recreational uses have included orienteering, four wheel driving, trail bike riding and horse riding. These uses are not consistent with the purposes of gazettal and will not be allowed to continue. Other uses which have had impacts on the natural and cultural values of the reserve include firewood collection, rubbish dumping (including granite off-cuts) and car dumping, as well as the dumping of domestic animals.

The reserve is also used for bushwalking and nature study, and by some local school groups for educational purposes. These uses are consistent with the purposes of gazettal of the nature reserve. A disused and partially rehabilitated road spoil quarry is located partly within the reserve on the eastern side of the Captains Flat Road.

Easements for three powerlines, an underground telephone line and an extension of the eastern gas pipeline also pass through the reserve.

Several roads through the park are used to access private and leasehold property. As explained in section 2.1, most of these roads are currently vested in the Minister for the Environment and must ultimately be added to or excluded from the park. The NPE Act states that the Minister cannot close any roads that provide the only means of practical access to a private land holding. The Service will consult with neighbours to determine the existing use of these roads and appropriate legal agreements for continued access and future maintenance. NPWS is not under any obligation to maintain Part 11 roads but may enter into maintenance agreements with the users.

#### 2.7. References

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- Smith, L.M. (2003). Preliminary (Desktop) European Cultural Heritage Study of Identified NPWS Parks and Reserves, NSW South West Slopes Region. Unpublished report to the NSW NPWS.

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# 3. MANAGEMENT ISSUES AND STRATEGIES

Current Situation	Desired Outcomes	Strategies	Priority
Soil and water conservation			
The soils in the valleys to the north are dispersible and tend to erode when the ground cover is disturbed. A large erosion gully has	Soil erosion is minimised.	Monitor the erosion gully in the northern sector of the reserve and take action if needed to arrest any ongoing erosion	Low
been formed at some stage in the reserve's history, probably as a result of the impacts of clearing and grazing on fragile soils.	Water quality is not compromised.	Undertake all works in a manner that minimises erosion and water pollution.	High
An extension of the eastern gas pipeline was constructed in 2001 within the existing powerline easements through the reserve. The easement was cleared and some remedial soil		Monitor erosion along the cleared electricity, telephone and gas pipeline easements and ensure remedial action is undertaken as needed.	Low
conservation works were undertaken on completion.		Develop a memorandum of understanding between the Service and power suppliers defining local arrangements and protocols for access and	High
Creek lines in the reserve feed into the Queanbeyan and Molonglo Rivers. Rubbish		maintenance.	
dumping and erosion thus have potential downstream water quality impacts for these rivers.		Control access to the reserve to reduce soil degradation and rubbish dumping.	High

Current Situation	Desired Outcomes	Strategies	Priority
Native plant and animal conservation			
Extensive vegetation survey and mapping has been undertaken in the reserve. A number of patches of high diversity grassy box woodland	All native plant and animal species and communities are	Remove rubbish and rehabilitate informal tracks resulting from past use of the reserve.	Medium
have been identified in the reserve.	conserved.	Monitor the abundance and distribution of <i>Leucochrysum albicans</i> subsp. <i>albicans</i> var. <i>tricolor</i> .	Low
recovering from past logging, firewood collection and grazing. Uncontrolled access in the past has created a maze of tracks, and	and habitat values are restored in areas	Control access to the reserve to prevent firewood collection.	High
associated widespread rubbish dumping.	logging.	Work with neighbours and catchment management authorities to encourage conservation of remnant	Low
<i>Leucochrysum albicans</i> subsp. <i>albicans</i> var. <i>tricolor</i> occurs within the power easements		developing links to other areas of remnant vegetation.	
and other areas with sparse groundcover. A number of threatened bird species that		Review the need for co-operative cat and fox control programmes to reduce predation of the ground nesting speckled warbler.	High
inhabit box woodland have been recorded in the vicinity of the reserve, including the booded rebin, speckled warbler and diamond		Liaise with the local community and councils regarding	
firetail. These birds are threatened due to habitat fragmentation, and even within the reserve may be vulnerable due to modification		and guidelines for management of domestic pets to help protect these species.	High
of ground habitat, and because of the relatively small areas of suitable habitat within the reserve. Speckled warblers are particularly			
vulnerable to predation by cats and foxes.			
One koala has been recorded within lands adjoining the reserve and koala populations			

have been recorded in similar habitat nearby. High intensity wildfire will impact on koala populations for many years. Koalas are also vulnerable to predation by dogs.	Habitat quality for threatened species is maintained.	Manage fire regimes consistent with requirements of koalas and Eastern false pipestrelles.	High
The eastern false pipestrelle is reliant on tree hollows for roosting, and its habitat is thus vulnerable to destruction by high intensity wildfires.		To protect koala habitat and individuals, an array of fire management strategies will be implemented to minimise the size, intensity and frequency of unscheduled fires.	High

Current Situation	Desired Outcomes	Strategies	Priority
Introduced species			
The main weeds present in the reserve are St Johns wort, blackberry and sweet briar. Other identified weeds requiring treatment include	The impact of introduced species on native species and	Control introduced plants and animals. Priority will be given to the control of St John's wort.	Medium
pine wildings, serrated tussock and Cootamundra wattle. Pest animals include rabbits, cats and foxes. Weed control programmes have been undertaken for the past two seasons since the	neighbouring lands is minimised.	Seek the cooperation of other authorities and neighbours in implementing weed and pest animal control programs, and eliminating the dumping of rubbish, garden refuse and domestic animals in the reserve.	Medium
reserve was gazetted.		Co-operative fox control programmes will be undertaken within the reserve where it is demonstrated that long-term reductions in fox numbers in the reserve will be achieved, and where the benefits of this for reserve fauna outweigh any risks associated with impacts on non-target fauna.	Low
		The Service will participate in co-operative fox control programmes off reserve where these meet objectives of the broader community and are demonstrated to have low impacts on non-target fauna.	Medium
		Monitor the reserve for noxious and significant environmental weeds, such as Chilean needle grass. Treat any outbreaks.	Medium

Current Situation	Desired Outcomes	Strategies	Priority
Fire management		Participate in the Lake George Zone Bushfire Management Committee. Maintain coordination and	Medium
A large number of rural residential properties	Persons and property	cooperation with RFS, brigades and neighbours with	
adjoin the eastern side of the reserve. Fuel	are protected from	regard to fuel management and fire suppression.	
levels in the vegetation community adjoining	bushfire.		
these assets are at the upper limit of		Liaise with the RFS and relevant landholders to	Medium
recommended levels for strategic fire	Cultural features are	determine the need for a strategic fire advantage on	
management zones.	damage by fire.	the eastern side of the reserve.	
Research conducted in similar dry sclerophyll		Undertake any prescribed burning activities identified	Medium
forest in the region (Doherty, 1997) suggests	Fire regimes are	for property protection in conjunction with the Lake	
that, in general, a long fire interval of up to 100 years is beneficial for floral biodiversity.	appropriate for conservation of plant	George Zone Bush Fire Management Committee.	
Therefore, given the relatively small size of the	and animal	Maintain the management trails shown on the map.	Medium
nurposes of biodiversity management will be	communities.	Enhance the fire advantage value of trails by	Medium
undertaken in the reserve within the life of this		mechanical means and by spraving regrowth on	MEdium
plan. Burning for asset protection purposes		adioining trails.	
may, however occur at shorter intervals			
		Prepare a map-based fire management strategy and	Medium
Widespread, high intensity fires have the		fire operations map for the reserve by the end of 2006.	
potential to destroy food, perching and nesting			
resources in this critical habitat for the		Fire management guidelines for maintaining the	Medium
threatened birds, koala and eastern false		biodiversity values of the reserve include:	
pipestrelle occurring in the area.		<ul> <li>Contain fires to as small an area as possible, to protect koala and pipestrelle habitat</li> </ul>	
Research will be undertaken to continue to		<ul> <li>If fires cannot be contained, attempt to reduce the</li> </ul>	
assess the impacts of the application or		intensity of fires using various techniques	
exclusion of fire on the flora and fauna. Fire		<ul> <li>Maintain as much of the reserve as possible in as</li> </ul>	
regimes will be modified if the existing regimes		old a fire age class as possible.	
are demonstrated to be inappropriate.		Monitor biodiversity in the different fire age classes	
		and adapt fire management accordingly.	

Current Situation	Desired Outcomes	Strategies	Priority
Cultural heritage			
There are a number of Aboriginal sites on the reserve, as well as chimney remains.	Cultural features are conserved and managed in	Precede all ground disturbance work by a check for cultural features, including work undertaken on the easement.	Low
of the reserve was undertaken in early 2002. The study identified that no additional broad- scale survey for Aboriginal sites was required for management purposes, but flagged the	significance.	Any works undertaken will incorporate appropriate conservation measures to mitigate impacts on cultural heritage.	Medium
necessity for ongoing site-specific survey for any works conducted within the reserve.		Consult and involve the Ngunnawal Local Aboriginal Land Council and other Aboriginal stakeholders in all aspects of management of Aboriginal sites, places and	Medium
Aboriginal archaeological material as:		values.	
<ul> <li>activities that impact on trails (including maintenance, vehicle movement, trail bike and 4WD use).</li> </ul>		Prohibit unauthorised access to the reserve to reduce impacts on cultural heritage.	High
<ul> <li>erosion (particularly at trail creek crossings),</li> </ul>		Continue to build on existing relationships with the local Aboriginal community to enhance exchange of	Medium
<ul> <li>maintenance and vegetation clearance along power lines and the gas pipeline, and the</li> </ul>		information about park values.	
• dumping of rubbish and builders' materials.			

Current Situation	Desired Outcomes	Strategies	Priority
Visitor use			
Due to the proximity of the reserve to Queanbeyan city and adjoining rural residential areas, the reserve has been utilised by a variety of user groups. Bushwalking and	The local community is aware of the significance of the area and of	Repair fencing and install gates into the reserve. Exclude vehicular access except for essential management requirements of the reserve.	High
informal camping occur within the reserve.	management programs.	Provide information on appropriate use of the reserve at all access points.	High
orienteering groups and horse riders commonly used the reserve prior to its gazettal.	Visitor use is ecologically sustainable.	Permit day bushwalks, informal picnics (no facilities will be provided and no fires permitted), and educational visits, subject to limits on numbers and other conditions if necessary to minimise impacts.	Medium
Many of these uses have had high impacts on the erodible soils within the reserve, reducing its habitat and aesthetic values. They have also diminished the enjoyment of passive users of the reserve.		Prohibit camping, trail bike riding, four wheel driving, orienteering and horse riding. Utilise a range of techniques including installation of barriers and law enforcement activities as necessary to prevent these activities continuing in the reserve.	High
		Monitor levels and impacts of use.	Medium
		Organise media releases, educational material and contact with neighbours and community organisations as needed.	Low

Current Situation	Desired Outcomes	Strategies	Priority
Research			
Research into the flora and fauna of the reserve conducted in 2001, along with the Aboriginal heritage survey conducted in 2002 form a good basis for informed management. Additional research into the fuel loadings and fire responses of flora within the reserve, and targeted surveys for threatened fauna are desirable.	Research enhances the management information base and has minimal environmental impact.	Undertake and encourage research to improve knowledge and management of natural and cultural heritage, with particular emphasis on fire and surveys for threatened species.	Low
Management operations			
There are many management tracks and informal trails within the reserve. These have been reviewed and a key framework of management trails identified.	Management facilities adequately serve management needs and have acceptable impact.	Maintain trails to be retained for management purposes (see reserve map). Close and rehabilitate other tracks. Any other trails not necessary for management purposes will also be closed and rehabilitated.	Medium Medium
		Enter into access and maintenance arrangements for use of park roads for access to private property where appropriate	

**High** priority activities are those imperative to achievement of the objectives and desired outcomes. They must be undertaken in the near future to avoid significant deterioration in natural, cultural or management resources.

Medium priority activities are those that are necessary to achieve the objectives and desired outcomes but are not urgent.

Low priority activities are desirable to achieve management objectives and desired outcomes but can wait until resources become available.