BLACK ANDREW NATURE RESERVE

PLAN OF MANAGEMENT

NSW National Parks and Wildlife Service

Part of the Department of Environment and Conservation (NSW)

October 2006

This plan of management was adopted by the Minister for the Environment on 10th October 2006.

Acknowledgments

This plan of management is based on a draft plan prepared by staff of South West Slopes Region, NPWS.

Cover photograph of Macphersons Creek by Angela Lonergan (NPWS).

Inquiries about this reserve or plan of management should be directed to the ranger at the NPWS Murrumbidgee Area Office, 7a Adelong Road, Tumut 2720 or by telephone on 69477000.

ISBN 1 74122 245 1

FOREWORD

Black Andrew Nature Reserve covers 1559 hectares and is located south of Burrinjuck Dam, 40km south west of Yass and 10km north west of Wee Jasper on the southern tablelands of NSW. The name Black Andrew is derived from the reserve's highest peak, Black Andrew Mountain, which rises to 935m above sea level at its highest point.

The reserve forms part of an almost continuous belt of native vegetation on the northern most extent of the Australian Alps and possesses a high diversity of vegetation types for such a relatively small area, due to the sharp changes in elevation. Up to seven distinct forest ecosystems have been identified within the reserve providing high quality habitat for a number of significant native fauna species.

Six animal species listed as vulnerable under the *Threatened Species Conservation Act 1995* have been recorded in the reserve. These include the yellow-bellied glider, common bent-wing bat, powerful owl, barking owl, brown treecreeper and booroolong frog. A disused mineshaft in the reserve, apart from being of historical importance, is also important because it is used by juvenile cave dwelling bats.

Black Andrew Mountain and surrounding lands were once extensively used by Aboriginal people. A number of Aboriginal sites have been found on the reserve, two of which are considered to be of high local and regional significance due to the abundance and quality of the artefacts, the lack of similar sites identified within the region and the level of significance to local Aboriginal people

The New South Wales *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 an area will be managed in the years ahead.

A draft plan of management for Black Andrew Nature Reserve was placed on public exhibition for three months from 10th June until 16th September 2005. The exhibition of the plan of management attracted 7 submissions that raised 7 issues. All submissions received were carefully considered before adopting this plan of management.

This plan of management establishes the scheme of operations for Black Andrew 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 (2002), the *Threatened Species Conservation Act 1995* (TSC Act) 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* (EPA Act) requires the assessment and mitigation of the environmental impacts of any works proposed in this plan.

A plan of management is a statutory document under the NPW Act. Once the Minister has adopted a plan, no operations may be undertaken within Black Andrew Nature Reserve except in accordance with the plan. The plan will also apply to any future additions to the 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

1.2.1 Nature Reserves

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.

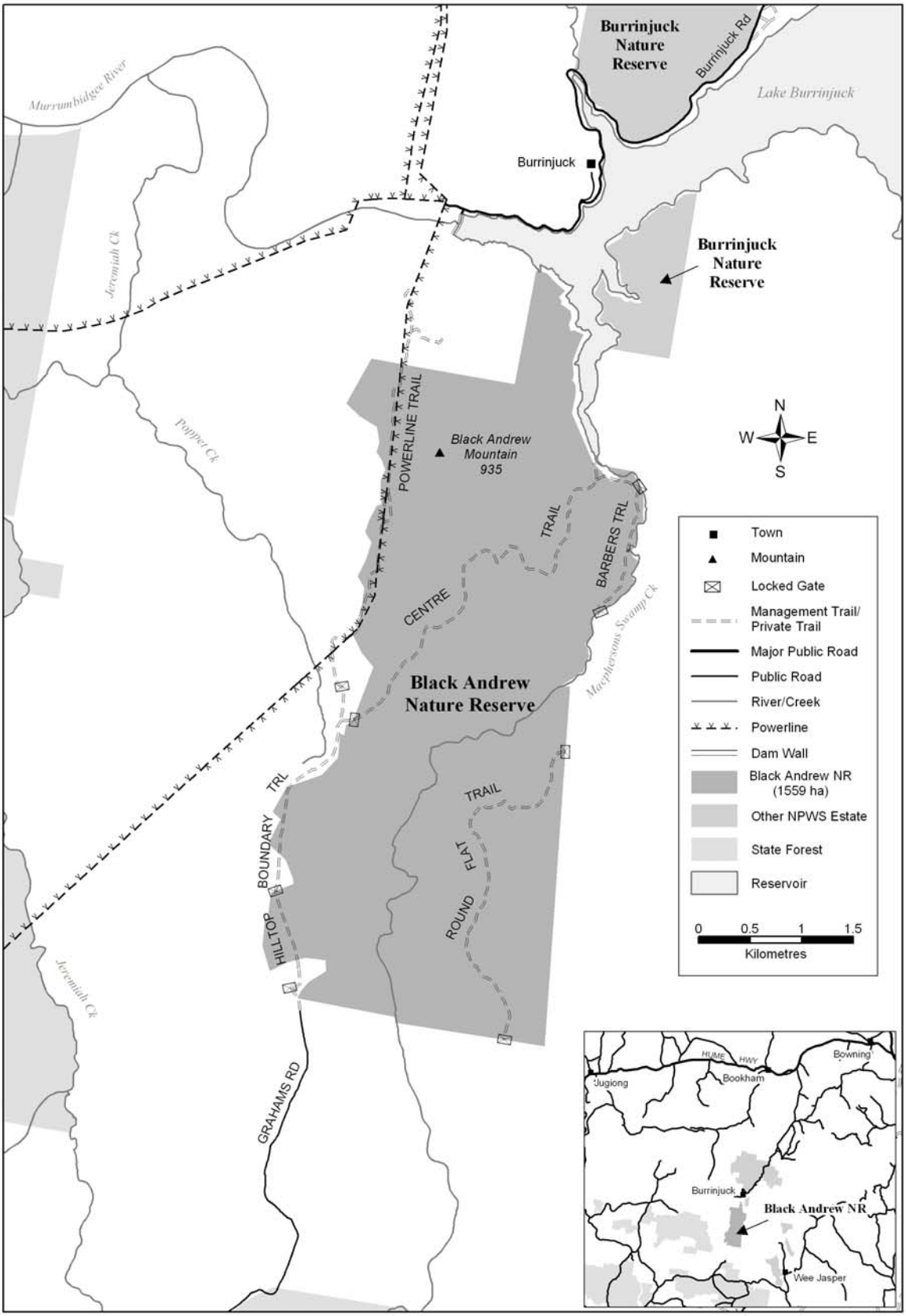
1.2.2 Regional Forest Agreements

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

RESERVE MAP


Burrinjuck Nature Reserve
Burrinjuck Rd
Lake Burrinjuck
Murrumbidgee River
Burrinjuck
Jeremiah Ck
Burrinjuck Nature Reserve
Popper Ck
POWERLINE TRAIL
Black Andrew Mountain 935
N
W
E
S
TRAIL
BARBERS TRL
CENTRE
Macphersons Swamp Ck
Black Andrew Nature Reserve
TRL
BOUNDARY
TRAIL
FLAT
ROUND
HILLTOP
Jeremiah Ck
GRAHAMS RD
Town
Mountain
Locked Gate
Management Trail/ Private Trail
Major Public Road
Public Road
River/Creek
Powerline
Dam Wall
Black Andrew NR (1559 ha)
Other NPWS Estate
State Forest
Reservoir
0 0.5 1 1.5
Kilometres
HUME HWY
Bowning
Jugiong
Bookham
Burrinjuck
Black Andrew NR
Wee Jasper

2. BLACK ANDREW NATURE RESERVE

2.1 LOCATION, GAZETTAL AND REGIONAL SETTING

Black Andrew Nature Reserve (herein referred to as “the reserve”) is located south of Burrinjuck Dam, 40km south west of Yass and 10km north west of Wee Jasper on the southern tablelands of NSW. Management responsibility for the 1559ha reserve was transferred to the National Parks and Wildlife Service on 1 January 2001 as part of the Southern Regional Forest Agreement.

The reserve forms part of an almost continuous belt of native vegetation on the northern most extent of the Australian Alps and, as such, supports a variety of plants and animals that are known to exist at similar elevations throughout Australia’s high country. Other conservation reserves exist to the north, south and east of the reserve, increasing its value as habitat for native plant and animal species. The name Black Andrew is derived from the reserve’s highest peak, Black Andrew Mountain, which rises to 935m above sea level at its highest point.

The lands surrounding the reserve are used for agriculture including grazing and cropping, and large scale pine forestry. The Murrumbidgee Catchment Management Authority, Yass and Gundagai Rural Lands Protection Boards, Tumut-Brungle Aboriginal Land Council, Yass Valley and Gundagai Shire Councils and State Water all have a management function over lands surrounding the reserve.

In the nature reserve is a road (the Powerline Trail) that is vested in the Minister for the Environment on behalf of the Crown for the purposes of Part 11 of the NPW Act. This road does not currently form part of the gazetted area of the reserve. It was created by the *National Parks Estate (Southern Region Reservations) Act* 2000 (NPE Act) to ensure that essential access arrangements which existed immediately before the reserve additions could continue. The NPE Act provides that, following assessment, this road must be either added to the reserve or excluded from the reserve.

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.

The geology, landform, climate, plant and animal communities of the area, plus its location, have determined how it has been used by humans. 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 AND CULTURAL HERITAGE

2.3.1 Landform, Geology and Soils

Black Andrew Nature Reserve is situated on the northern foothills of the Australian Alps. The reserve has an altitudinal range of between 370 and 935 metres above sea level. The topography is moderately steep and consists primarily of a large north-south aligned ridge falling sharply to the valley floor in the reserve's east. The southeast corner comprises the only relatively flat plateau topography contained within the reserve.

The southern half of the reserve is dissected by Macphersons Swamp Creek, which runs from south to north, then north-east into the southern arm of Burrinjuck Dam. Macphersons Swamp Creek holds water for the majority of the year and flows through the base of a very steep gorge that ranges in altitude from 400m to 700m and is approximately 400 metres wide.

The geology of the reserve is dominated by two distinct rock types. The majority of the reserve lies on a Middle Devonian conglomerate and shale sequence, whilst the western portion contains Silurian granites intruded by Tertiary olivine basalts (Bureau of Mineral Resources, 1978). As a result, the soils of the reserve are dominated by decomposed conglomerate material leaving a sandy clay loam containing gravels and larger stones and rock fragments. Gravelly clay loams have formed on the areas of granite and basalt regolith. These soils are friable and generally lack organic content leading to low water-holding capacity and fertility.

A key scenic value of the reserve is the view to the north and east from high points in the reserve's north. Expansive views of Burrinjuck Dam and the south west slopes of NSW are enjoyed from within the reserve.

2.3.2 Native Plants

The reserve possesses a high diversity of vegetation types for such a relatively small area, due to the sharp changes in elevation. Up to 7 distinct forest ecosystems have been identified within the reserve providing high quality habitat for a number of significant native fauna species.

Vegetation communities recorded in the reserve by EcoGIS (2004) can be summarised as:

1. **Blue Gum – Peppermint dry grass/shrub forest** - containing a canopy of blue gum *Eucalyptus bicostata*, broad-leaved peppermint *E. dives*, red stringbark *E. macrorhyncha* and narrow-leaved peppermint *E. robertsonii ssp robertsonii*, a mid storey of silver wattle *Acacia dealbata*, shiny cassinia *Cassinia longifolia*, a shrub/grass layer consisting of Austral bracken *fern Pteridium esculentum*, guinea flower *Hibbertia obtusifolia*, prickly broom-heath *Monotoca scoparia* and snow grass *Poa sp* existing on granite based soils.

2. **Moist Ribbon Gum grassy forest** – containing a canopy of ribbon gum *Eucalyptus viminalis* and narrow-leaved peppermint *E. robertsonii ssp robertsonii,* a shrub layer of silver wattle Acacia dealbata and Austral bracken fern *Pteridium esculentum,* and a grass/forb layer of bidgee-widge *Acaena novae-zelandiae*, *Geranium solanderi var*

solanderi, Dichondra repens, snow grass *Poa meionectes* and weeping grass *Microlaena stipoides* existing on basalt soils.

3. **Macphersons Swamp grassy forest** – containing a canopy of apple box *Eucalyptus bridgesiana*, narrow-leaved peppermint *E. robertsonii ssp robertsonii*, black sallee *E. stellulata*, woolly tea-tree *Leptospermum lanigerum* and black wattle *Acacia melanoxylon*, a shrub layer of dagger wattle *Acacia siculiformis*, sweet bursaria *Bursaria spinosa*, *Australian anchor plant *Discaria pubescens* and handsome flat-pea *Platylobium formosum* and a grass/forb layer of bidgee-widge *Acaena novae-zelandiae,* weeping grass *Microlaena stipoides var stipoides* and *Lomandra filiformis ssp coriacea* on deep colluvial soils along the creek bank.

4. **Riparian gully forest** – containing a canopy of black wattle *Acacia melanoxylon*, blue gum *Eucalyptus bicostata*, apple box *E. bridgesiana* and Austral mulberry *Hedycarya angustifolia,* a shrub layer of Austral bracken fern *Pteridium esculentum*, silver wattle *Acacia dealbata*, hazel pomaderris *Pomaderris aspera* and shiny cassinia *Cassinia longifolia,* and a grass/forb layer of *Microlaena stipoides var stipoides, Poa meionectes, Senecio species* and *Elymus scaber var scaber* in deeper colluvium or granite based soils

5. **Apple Box- Norton's Box moist grassy forest** – containing a canopy of apple box *Eucalyptus bridgesiana* and Norton's box *E. nortonii*, a shrub layer of silver wattle *Acacia dealbata* and Austral indigo *Indigofera adesmiifolia* and a grass/forb layer of *hydrocotyle laxiflora, Geranium solanderi var solanderi, Microlaena stipoides var stipoides, Poa meionectes, Elymus scaber var scaber, Wahlenbergia stricta ssp stricta* on eastern facing slopes containing granite soils.

6. **Escarpment Long-Leaved box – Black Cypress heath/shrub forest** – containing a canopy of long-leaved box *Eucalyptus goniocalyx* and a diverse shrub layer containing common fringe-myrtle *Calytrix tetragona*, guinea flower *Hibbertia calycina*, varnish wattle *Acacia verniciflua*, shiny cassinia *Cassinia longifolia*, grass tree *Xanthorrhoea glauca ssp angustifolia*, Deane's wattle *Acacia deanei ssp deanei*, woolly grevillea *Grevillea lanigera x polybractea* and the bitter-pea *Daviesia pubigera*. The sparse ground layer contains the lily *Dianella revoluta var revoluta,* stiff geebung *Persoonia rigida* and the leopard orchid *Diuris maculata* on exposed rock faces in the north east of the reserve

7. **Nortons Box Poa grass forest** – containing Norton's box *Eucalyptus nortonii*, red stringybark *Eucalyptus macrorhyncha*, slender tea-tree *Leptospermum brevipes*, shiny cassinia *Cassinia longifolia*, guinea flower H*ibbertia obtusifolia*, *Chrysocephalum semipapposum* and snow grass *Poa sieberana* on the western slopes of the reserve.

A small area of river she-oak *Casuarina cunninghamiana* exists in the lower reaches of Macphersons Swamp Creek.

The diversity of forest types within the reserve provide habitat for a number of threatened, rare and declining fauna species. Locally this diversity is considered significant.

* indicates species listed as vulnerable on the *Threatened Species Conservation Act,1995*

2.3.3 Native Animals

Given the high diversity of vegetation types in the reserve, it is expected that fauna diversity would be equally high. Surveys carried out by NPWS (2004) confirmed this by revealing a high number of native species including 6 species listed as vulnerable on the *Threatened Species Conservation Act 1995*. These include the yellow-bellied glider *Petaurus australis*, common bent-wing bat *Miniopterus schreibersii*, powerful owl *Ninox strenua*, barking owl *Ninox connivens*, brown treecreeper *Climacteris picumnus* and booroolong frog *Litoria booroolongensis*. At this stage the conservation of the booroolong frog is reliant on maintaining natural streams and riparian habitats. Any activities that may cause a change in the habitat for this species, such as an increase in sediment loads, are potentially detrimental to the population of the booroolong frog. The existence of feathertail gliders *Acrobates pygmaeus* within the reserve is also of interest. It is a small arboreal mammal that, although considered widespread across south-east Australia, is relatively uncommon on the southern tablelands and south west slopes. This species requires “a large diversity of native trees to provide year round nectar” (Menkhorst, 2001).

A high diversity of bat species (11 in total) were recorded during the 2004 surveys including both forest and cave dwelling species. A number of caves exist in the area leading to this high diversity. A disused mineshaft in the reserve is being used by juvenile cave dwelling bats, such as bent-wing bats and eastern horse-shoe bats *Rhinolophus megaphyllus*. Deep deposits of guano suggest that this shaft has been used for many years by bats dispersing from nearby maternal roost sites. There are few other known roost sites for horse-shoe bats in the region (Schulz, 2004. pers. comm.)

The creek in the reserve is likely to provide habitat for threatened native fish species, such as Macquarie perch, which are protected under the *Fisheries Management Act 1994*.

Fauna species recorded in the reserve to date include 29 mammals species (5 of these being introduced), 83 bird species, 16 reptile species and 3 amphibian species although more species are likely to use the reserve and surrounding lands on a seasonal basis.

Habitat value of the reserve is therefore high given the high diversity of fauna species identified. The reserve forms part of a broader habitat for these species and others are likely to exist in and around the reserve.

2.4 CULTURAL HERITAGE

2.4.1 Aboriginal Heritage

Black Andrew Nature Reserve is situated within the administrative region of the Tumut-Brungle Aboriginal Land Council. The Snowy Mountains Elders Group also have an interest in the area. The reserve lies near the border of lands occupied by the Wiradjuri and Ngunnawal People.

Preliminary Aboriginal site surveys carried out by Dearling (2003a) revealed a number of Aboriginal sites within the reserve. A large number of Aboriginal artefacts were

recorded in 12 open scatters and 5 isolated finds. As well as these sites an area of Potential Archaeological Deposit (PAD) was recorded.

Site surveys undertaken after the bushfires of early 2003 located artefacts from both within and additional to the previously recorded sites. Most sites were located on or near roads due to the exposure of sites from past disturbance. Artefacts consisted of flakes, cores, blades and flaked pieces. A small river stone, once used as a hammer stone, was also identified during the survey (Dearling, 2003b).

Given the high frequency of artefacts in the reserve, it is thought that Black Andrew Mountain and surrounding lands were once extensively used by Aboriginal people. Individually the sites have varying archaeological significance. Two of the artefact scatters are considered to be of high local and regional significance due to the abundance and quality of artefacts (both contained hundreds of individual artefacts), the lack of similar sites identified within the region and the level of significance to local Aboriginal people.

Aboriginal communities have an association and connection to the land. The land and water biodiversity values within a landscape are central to Aboriginal spirituality and contribute to Aboriginal identity. Aboriginal communities associate natural resources with the use and enjoyment of foods and medicines, caring for the land, passing on cultural knowledge and strengthening social bonds. Aboriginal heritage and nature are inseparable from each other and need to be managed in an integrated manner across the landscape.

2.4.2 Non-Aboriginal Heritage

Black Andrew Nature Reserve is located within the Parish of West Goodradigbee, County of Buccleuch. Prior to the establishment of the nature reserve in 2001, the reserve was crown land managed by the then Department of Land and Water Conservation. During this time it was leased by Samuel Barber and managed as part of the “Cooradigbee Holding”. This land was then broken up into smaller leases managed variously as Occupational, Conditional or Scrub Leases by members of the Barber family and others, primarily for grazing of cattle and sheep. The lease on the land appears to have continued in Barber’s name up until gazettal of the nature reserve on 1 January 2001. A small section of land immediately north of the reserve was declared a Water Reserve in 1904 in preparation for the construction of Burrinjuck Dam many years later (Dearling, 2003c).

During World War I, mineral exploration across the state was at a peak. Traces of wolfram and bismuth were found in the south west of the now nature reserve leading to the establishment of the Black Andrew Mine. Production continued sporadically up until World War II when peak production was achieved. The mine has not been used or maintained since this time (Dearling 2003c). Some of the surface features were destroyed by fire in 2003. The stability of the shaft is unknown, although some of the timber supports within the shaft have deteriorated over time. The entrance to the mineshaft was fenced by NPWS in 2002. Investigations are underway to determine how to manage the historic aspects of this site whilst maintaining public safety and the habitat value of the mine for cave dwelling bats.

2.5 PUBLIC USE

There are no public access trails leading to the boundary of the nature reserve. All trails within the reserve are management trails and are not for public vehicular use. There are no public facilities in the reserve.

Recreational activities not consistent with the study of nature and natural environments are generally considered inappropriate uses of nature reserves. The reserve currently receives low levels of use for activities such as nature study, walking and bird watching. Reserve identification signs are located at the main entrance points.

2.6 OTHER USES

Powerline Trail in the north west of the reserve is used by both State Water and Transgrid as access to facilities associated with power supply from Burrinjuck Dam. As explained in section 2.1, this road is currently vested in the Minister for the Environment and must ultimately be added to or excluded from the reserve. The NPE Act states that the Minister cannot close any roads that provide the only means of practical access to a private land holding. NPWS 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 these users.

2.7 THREATS TO RESERVE VALUES

2.7.1 Introduced Plants

An introduced plant species is defined in this plan as any plant species not endemic 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 ecological values 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 they occupy to the extent necessary to prevent such weeds spreading to adjoining lands. NPWS also has a priority to control environmental weeds (not necessarily declared noxious) which threaten natural habitats.

The NPWS South West Slopes Region Pest Management Strategy (2004) identifies priority pest species and programs for action through set criteria. By following a similar process the prioritisation of reserve pest species programs may be established and directly linked into the regional strategies (refer to the South West Slopes Region Pest Management Strategy). This risk analysis will consider such issues as (yet not limited by) the control of weeds in endangered ecological communities, significant remnant vegetation associations, threatened/endangered species habitat and areas of community/neighbour concern. The risk of new weed incursions will also be considered.

Introduced plant species recorded in the reserve include St. John's wort *Hypericum perforatum*, blackberry *Rubus fruticosis*, sweet briar *Rosa rubiginosa*, Paterson's curse *Echium plantagineum* and great mullein *Verbascum thapsus.* Since gazettal, weed control programs have focussed on reducing the extent of blackberry and St John's wort infestations and the local eradication of great mullein.

2.7.2 Introduced Animals

An introduced animal species is defined in this plan as any animal species not native to the reserve. Introduced animals may impact upon native fauna populations through predation or competition for food or shelter. Introduced animals in the reserve include wild dogs, feral pigs, red foxes, rabbits, feral goats and feral cats. All introduced species are managed in accordance with the actions listed in the Regional Pest Management Strategy. Evidence of stray sheep and cattle entering the reserve exists in some locations, however this problem should be ameliorated following the completion of fencing after the 2003 bushfires. Trout have been recorded in Macphersons Swamp Creek and may be impacting on the threatened Booroolong frog as recent research has indicated the potential for trout to prey on this species (Hunter 2003).

An annual program of aerial shooting of feral goats has reduced local populations and will continue while this method of control is cost effective and achieves the desired result. This program is carried out in conjunction with a complementary program in the nearby Burrinjuck Nature Reserve. The reserve is included in the Gundagai and Burrinjuck Cooperative Wild Dog and Fox Control Plans.

The SWS Region Pest Management strategy also identifies the pest animal species known to occur within the region including the reserve and ranks them in terms of their potential to damage land, alter natural processes and/or disturb native animal populations and habitats. Management strategies for each species are outlined in this document as well as preferred methods of control.

2.7.3 Fire

Fire is a natural feature of many Australian vegetation communities and environments. It may be essential to the survival of some plant communities and benefit some fauna species. Inappropriate fire regimes can lead to the loss of many other plant and animal species and communities. Fire can also damage cultural heritage features and management facilities within the reserve and can threaten visitors and neighbouring assets.

Since 1972, there have been 3 recorded unplanned fires in the reserve, the majority caused by lightning which started outside the reserve. In 2003, one of these wildfires burnt most of the reserve. This fire started on private land to the reserve's north west, on a day of extreme fire weather conditions.

Fuel reduction burns were implemented in 1989 and 1991. These were conducted by local Rural Fire Service (RFS) brigades to protect nearby assets from potential unplanned fire events. These burns combined covered almost all of the reserve.

The frequency of fire and short time between each fire suggests that the vegetation, soils and environment across 85% of the reserve is overburnt (as at 2004). This threatens species of plants and animals, soil and slope stability, catchment and water quality values. The high frequency of fire may also promote fire tolerant and more volatile species of plant (eg. bracken, daviesia and cassinia) to persist over other plants. This has been indicated in the vegetation surveys by EcoGIS 2004. The persistence of these types of plants may encourage higher bushfire behaviour in the future and be maintained if inappropriate fire management strategies are implemented.

There are a number of assets within 1km of the reserve boundary, mostly associated with agriculture (homesteads, sheds, pastures) and pine plantations. These assets will be considered when developing the fire plan for this reserve. As part of the fire planning process NPWS bushfire management zoning system for reserves will be implemented. This zoning system was adopted from the Bushfire Management Committee (BFMC) bushfire risk management plans.

NPWS maintains cooperative arrangements with surrounding landowners and RFS brigades and is actively involved in the Yass Zone Bush Fire Management Committee. Cooperative arrangements include approaches to trail maintenance, asset protection, fuel management, support for neighbour fire management efforts and information sharing.

In accordance with current NPWS policy, a Type 2 (map-based) Fire Management Plan will be produced for the reserve within the lifetime of this plan. This plan will outline life, property and natural and cultural resource protection strategies specific to the reserve.

2.8 References

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3. MANAGEMENT ISSUES AND STRATEGIES

Current Situation	Desired Outcome	Strategies	Priority
Soil and water conservation The soils of the reserve are prone to erosion when exposed. Fires in 2003 affected most of the reserve. Water quality is generally good within the creeks of the reserve.	➢ Soil erosion and water quality is monitored and minimised.	➢ Undertake all works in a manner that minimises erosion and water pollution. Undertaken trail maintenance works in accordance with South West Slopes Region Environmental Safeguard Code of Practice and Fire Trail Maintenance Policies (2001). Monitor the reserve and take action when needed to control erosion.	Medium
Research Scientific study is needed to improve understanding of the reserve's natural and cultural heritage processes.	➢ 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.	Medium

Current Situation	Desired Outcomes	Strategies	Priority
Native plant and animal conservation The reserve possesses a high diversity of native flora and fauna. A number of threatened species exist within the reserve. These include arboreal mammals, bats, birds and frogs. Threats to these species are well documented. The effects of the fires on these species is unclear. The reserve contains important habitat for cave dwelling bats, including the disused mine shaft. Some of this habitat is under threat due to instability of the mineshaft following the 2003 bushfires. The effect of the 2003 fires on the reserve's vegetation is currently being monitored. The creek in the reserve may provide habitat for threatened native fish species. The reserve is generally linked to other tracts of native vegetation, allowing movement of native animals between potential habitats.	➢ All native plant and animal species and communities are conserved. ➢ The habitat value of the reserve, both in isolation and as part of a broader vegetated landscape, is maintained. ➢ Public safety is maintained.	➢ Implement measures included in recovery plans for threatened species when prepared ➢ Work with neighbours and vegetation management committees to encourage conservation of remnant native vegetation in the vicinity of the reserve. ➢ Research options for the management of the mineshaft. Consider gating or fencing of mineshaft to prevent public access whilst ensuring that bat movement is not inhibited. ➢ Undertake further research on the type of usage of the mineshaft by bent-wing and horse-shoe bats (ie maternity site, hibernation roost, juvenile dispersal roost, non-breeding roost). ➢ NPWS will apply relevant management strategies to conserve native fish and their habitat in the reserve as required and in consultation with NSW Fisheries.	High Medium Medium Medium Medium

Current Situation	Desired Outcomes	Strategies	Priority
Introduced species The reserve contains a number of weed species including blackberry, St. John's wort and great mullein. Control programs have been commenced for these species in accordance with regional priorities. The reserve contains a number of introduced animals species including wild dogs, feral pigs, red foxes, rabbits, feral goats, feral cats and introduced trout. Straying cattle and sheep occasionally enter the reserve due to the 2003 fires having destroyed boundary fences. Trout may impact on the booroolong frog in Macphersons Swamp Creek.	➢ The impact of introduced species on native species, particularly threatened species, and neighbouring lands is minimised.	➢ Control introduced plant and animal species in accordance with the regional pest management strategy. Priority will be given to reduction in size of blackberry and St. Johns wort infestations and local eradication of great mullein. ➢ Seek the cooperation of other authorities and neighbours in implementing weed and pest animal control programs. ➢ Undertake on-going control programs for feral animals on a priority basis in accordance with the regional pest management strategy. ➢ Monitor noxious and significant environmental weeds. Treat any new outbreaks. ➢ Implement recommendations in the Recovery Plan for the Booroolong Frog (in draft).	High Medium High Medium Medium

Current Situation	Desired Outcomes	Strategies	Priority
Fire management Research suggest frequent or regular fire can lead to the loss of particular plant and animal species and communities. Fire has damaged cultural features and fences and threatened neighbouring land in the past. Ignitions occur outside and inside the reserve, with prominent movement from the NW to SE. In 2003 fires effected most of the reserve. The scale of these effects has not been intensively researched. The reserve is close to a number of pine plantations and other assets. Fire management strategies are being developed for the reserve.	➢ Life and property assets within the reserve and immediate boundary are protected from fire. ➢ Natural and cultural values within the reserve are protected from fire. ➢ Fire regimes are appropriate for conservation of plant and animal communities.	➢ Continue to participate in the Yass Zone Bush Fire Management Committee. Maintain coordination and cooperation with Rural Fire Service brigades, fire control officers and neighbours with regard to fuel management and fire suppression. ➢ Where possible contain all bushfires in the reserve to as small an area as possible, especially during high bushfire danger periods. ➢ Encourage further research into the ecological effects of fire in the reserve. Maintain fuel monitoring sites, including fuel vegetation photographic records every two years where possible, or directly after fire. ➢ Prepare map-based fire management strategies for the reserve within 2 years, detailing life, property, natural and cultural resource protection strategies. ➢ Prepare a Fire Operations Map for the reserve that shows assets, fire advantages and contact details for use by all agencies in the event of wildfire.	High High Medium High High

Current Situation	Desired Outcomes	Strategies	Priority
Visitor use There are no visitor facilities and no public vehicular access within the reserve. Use of the reserve by the public is limited. Signage is located at entry points to the reserve indicating the reserve boundary and activities permitted and not permitted within the reserve. Use of the reserve must be carefully managed since it is a small and significant area of remnant vegetation.	➢ The local community is aware of the significance of the area and of management programs. ➢ Visitor use is ecologically sustainable.	➢ Maintain reserve identification signage at reserve boundaries ➢ Recreational use such as walking and bird watching will be permitted as these activities are compatible with the purposes and principles for nature reserves. Camping, public vehicular access, horse riding, cycling and solid fuel fires will not be permitted.	Medium Medium
Cultural Heritage There are a number of cultural heritage sites recorded within the reserve.	➢ Cultural features are conserved and managed in accordance with their significance.	➢ Any Aboriginal heritage sites found in the reserve will be recorded, conserved and protected in consultation with relevant Aboriginal groups. ➢ Continue to build on existing relationships with the local Aboriginal community to enhance exchange of information about tangible and intangible park values. ➢ Research will be undertaken on the history of the mine within the reserve.	Medium Medium Medium

Current Situation	Desired Outcomes	Strategies	Priority
Management operations The reserve contains a number of management trails for fire suppression, weed and feral animal control and other management operations. The reserve boundary fences were destroyed during the 2003 bushfires. Fences are being re-erected in accordance with the NPWS Boundary Fence Policy.	➢ Management facilities adequately serve management needs and have acceptable impact. ➢ All non-reserve facilities are licensed. ➢ Domestic stock do not enter the reserve.	➢ Maintain trails shown on the Reserve Map (page 3) for management purposes. ➢ Negotiate access and maintenance arrangements with State Water and Transgrid for use of reserve roads for access to facilities. ➢ In consultation with neighbours formulate fencing agreements to ensure that replacement fences are constructed to a stock proof standard.	High Medium High

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.