

# **MUDJARN NATURE RESERVE**

## **PLAN OF MANAGEMENT**

**NSW National Parks and Wildlife Service**

**Part of the Department of Environment and Climate Change NSW**

**July 2008**

**This plan of management was adopted by the Minister for Climate Change and the Environment on 21<sup>st</sup> July 2008.**

### **Acknowledgments**

This plan of management was prepared by staff of South West Slopes Region of NPWS (now the Parks and Wildlife Division of the Department of Environment and Climate Change NSW) with valuable assistance from the Brungle community.

The Service would like to thank those members of the Brungle community who attended a series of community meetings to discuss the content and progress of this plan.

Cover photograph: looking towards Mudjarn Nature Reserve by Jo Caldwell, DECC.

Inquiries about Mudjarn Nature Reserve or this plan of management should be directed to the NPWS South West Slopes Region Office, 7a Adelong Rd, Tumut NSW 2720 or by telephone on 69477000.

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**ISBN 1 74122 250 8**

## FOREWORD

Mudjarn Nature Reserve is located two kilometres south of Brungle and 15 kilometres north of Tumut on the South West Slopes of New South Wales. It consists of two parcels of land totalling 591 hectares and forms part of a broader fragmented native landscape in an otherwise heavily cleared environment.

The reserve is also known locally as “Pine Mountain” due the locally abundant Black Cypress Pine (*Callitris endlicherii*), which gives the reserve a very dark appearance and makes it stand out from other high points in the area.

Mudjarn Nature Reserve protects areas of remnant native forest, including small pockets of Yellow Box and Red Gum woodland, a component of the endangered White Box - Yellow Box - Blakely’s Red Gum woodland community. Nine species of mammal, four frogs, seven reptiles and 153 species of bird have been recorded in the reserve, including six threatened bird species.

Mudjarn Nature Reserve also protects Aboriginal cultural heritage sites, landscapes and other features that have high significance to the local Aboriginal community. Whereas the valleys were a focus for living, the high peaks and hills are associated with ritual. Initiations are known to have occurred within the ranges and hills until the 1920s.

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 Mudjarn Nature Reserve was placed on public exhibition from 10<sup>th</sup> June until 16<sup>th</sup> September 2005. The submissions received were carefully considered before adopting this plan of management.

This plan contains a number of actions to achieve “Better environmental outcomes for native vegetation, biodiversity, land, rivers, and coastal waterways” (Priority E4 in the State Plan) including control of introduced plants and animals, implementation of fire management strategies and working with neighbours to prevent the incursion of stock on to the reserve.

This plan of management establishes the scheme of operations for Mudjarn Nature Reserve. In accordance with section 73B of the *National Parks and Wildlife Act 1974*, this plan of management is hereby adopted.

**Verity Firth**  
**Minister for Climate Change and the Environment**

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## 1. MANAGEMENT CONTEXT

### 1.1 LEGISLATIVE AND POLICY FRAMEWORK

The management of nature reserves in NSW is governed primarily by the *National Parks and Wildlife Act 1974* (NPW Act), the National Parks and Wildlife Regulation, 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 this plan, no operations may be undertaken within Mudjarn Nature Reserve except in accordance with the plan. This plan will also apply to any future additions to Mudjarn Nature Reserve. Where management strategies or works are proposed for the reserve or any additions that are not consistent with this plan, an amendment to the plan will be required.

### 1.2 MANAGEMENT PURPOSES AND PRINCIPLES

#### 1.2.1 Nature Reserves

Nature reserves are gazetted 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 (RFA) are one of the principal 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.

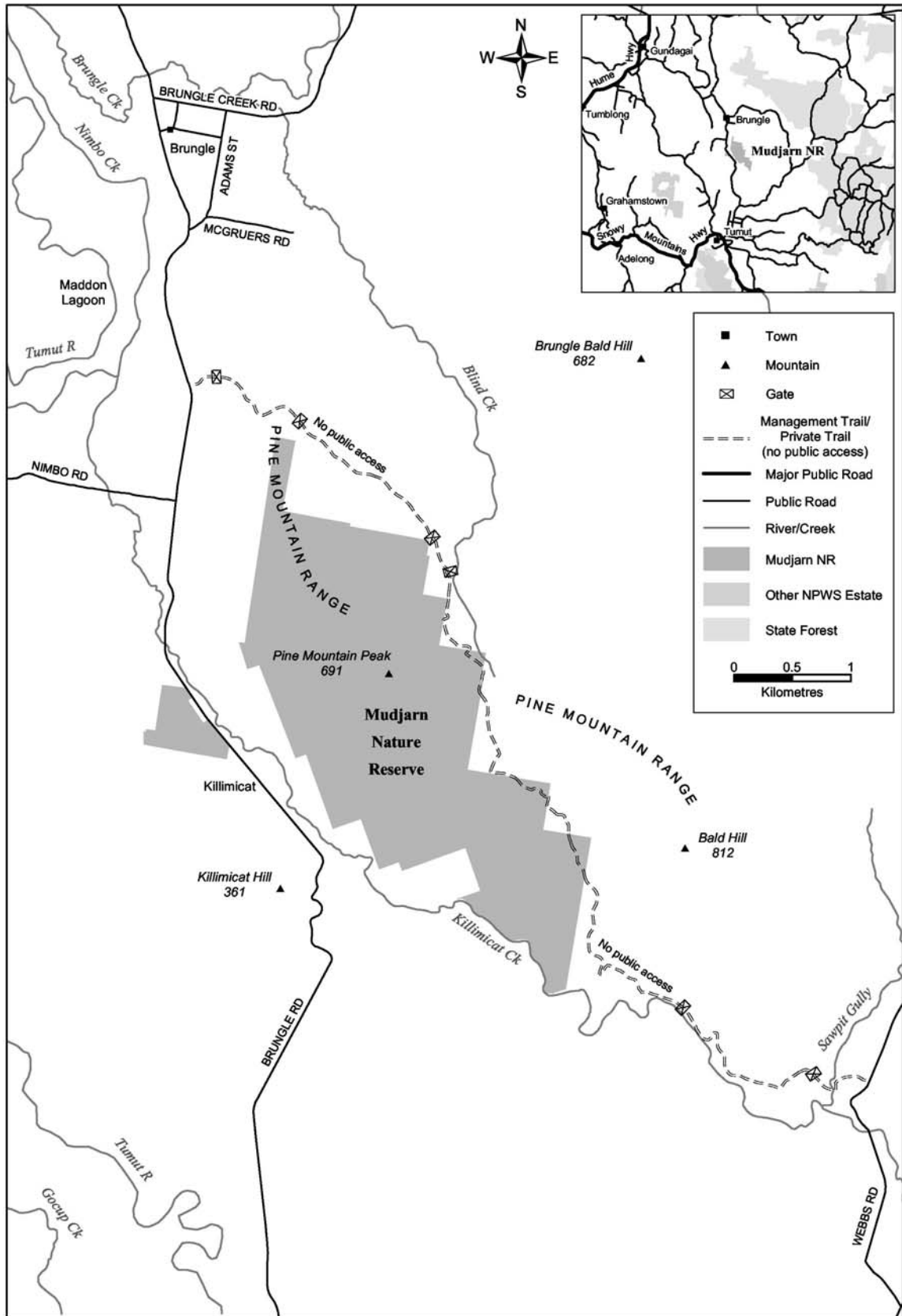
The Southern Regional Forest Agreement included the South West Slopes Region. The process leading up to the RFA provided for major additions to the reserve system, including the establishment of Mudjarn Nature Reserve

### **1.2.3 Aboriginal Community Involvement**

The Brungle/Tumut Aboriginal community was extensively involved in the production of this plan. Regular community meetings were held to discuss the content, intent and scope of the plan to ensure that the values of the nature reserve to the Aboriginal community were not lost and, indeed, enhanced by the actions set out in the plan.

Regular Aboriginal community meetings are set to continue for the life of this plan, once it has been adopted by the Minister. The aim of these is to ensure that management operations are carried out in consultation with the local community and in a manner that enhances the cultural values of the reserve.

# RESERVE MAP



## 2. MUDJARN NATURE RESERVE

### 2.1 LOCATION, GAZETTAL AND REGIONAL SETTING

Mudjarn Nature Reserve (referred to herein as “the reserve”) is located 2 kilometres south of Brungle and 15 kilometres north of Tumut on the South West Slopes of NSW. It consists of two parcels of land totalling 591 hectares and was gazetted as a nature reserve as part of the Southern Regional Forest Agreement (2000). The largest parcel of the reserve is located east of the Brungle Road and totals 566 hectares. A small parcel of land (Portion 134), also included in the reserve, is located immediately west of Brungle Road and totals 25 hectares.

The reserve is also known locally as “Pine Mountain” due the locally abundant black cypress pine (*Callitris endlicherii*). Prior to gazettal, the land was crown land managed by the then Department of Land and Water Conservation as Pine Mountain Range. There were a number of grazing and mining leases granted over various parts of the reserve during this time.

The name Mudjarn is possibly derived from the Aboriginal word “mudji” which is thought to mean totem or friend (Vince Bulger pers comm.). Howitt (1904) also states that the word “mudj” means “a whirring instrument”. The association between this word and the reserve is not clear. The nature reserve holds high significance to the local Aboriginal community, particularly those with an association to Brungle village.

The reserve forms part of a broader fragmented native landscape in a heavily cleared and disturbed environment. To the west is Minjary National Park, Ellerslie Nature Reserve and Tumblong State Conservation Area. To the south-east are the extensive native forests of northern Kosciuszko National Park. To the east are large pine plantations of Buccleuch State Forest.

The reserve is surrounded by private freehold land, which is predominantly used for grazing, cropping and small-scale vineyards. The reserve has a long history of use for timber collection for fencing and firewood and for grazing of cattle and sheep under permit.

The reserve is within the area of Tumut Shire Council, Tumut-Brungle Aboriginal Land Council, Murrumbidgee Catchment Management Authority and Gundagai Rural Lands Protection Board.

### 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.

Mudjarn Nature Reserve protects areas of remnant native forest and the fauna species that it supports. It also protects Aboriginal cultural heritage sites, landscapes and features that have high significance to the local Aboriginal community.



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, burning and forestry activities have all shaped the landscape as it is seen today. Small areas of remnant native vegetation are now considered valuable as providing habitat for native wildlife, especially when compared with vegetation coverage pre-European settlement.

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, such as 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**

Mudjarn Nature Reserve provides a striking landscape that can be seen from long distances. It has a heavy cover of callitris pine (*Callitris endlicheri*) and kurrajong (*Brachychiton populneus*) which gives the reserve a very dark appearance and makes it stand out from other high points in the area. Due to steep slopes and poor soils, the reserve was not prime grazing land and was therefore not cleared like the surrounding land.

The predominant underlying geology is Silurian granite, with large outcrops protruding the soil surface, particularly on the reserve's western face. Smaller areas of sandstone, siltstone and shale exist in and around the reserve. On the flats between the two parcels of reserve are deeper alluvial gravels, sand, silt and clay deposited by Killimicat Creek.

Underlying parent materials, topography and climate have shaped the soil types that exist in the reserve today. Soils are generally skeletal lithosols formed mostly of decomposing granite and rock fragments. The soils on the flats are much more fertile, consisting of finer yellow and red earths, however most of the more fertile soils exist on neighbouring farmland. Soil depths vary from between 0cm and about 40cm deep. The erosion potential of the soils of the reserve is high.

The nature reserve receives, on average, between 900–1200mm of rain per year. There is no permanent water in the reserve, however, a series of deeply incised drainage lines exist on the steep western face of the reserve, indicating periodic high flows of water in ephemeral drainage lines. Killimicat Creek forms the southern border of the park for 1km. The western fall of the reserve and portion 134 lie within Killimicat Creek Catchment. The eastern part of the reserve flows into Blind Creek. Both creeks flow into the Tumut River within 5kms of the reserve.

### **2.3.2 Native Plants**

The South West Slopes bio-region of New South Wales is one of the most highly disturbed and altered landscapes in NSW (Gibbons & Boak, 2002). Given the history of

clearing, burning and grazing in the region, all remaining areas of intact remnant native vegetation are now considered significant when compared to pre-1750 vegetative coverage.

The reserve consists of dry open forest containing predominantly black cypress pine (*Callitris endlicheri*), kurrajong (*Brachychiton populneus*), red and yellow box (*Eucalyptus polyanthemos*, *E. melliodora*) and Blakely's red gum (*E. blakelyii*). Vegetation surveys and mapping undertaken by EcoGIS (2002) identified up to three distinct forest ecosystems. These ecosystems, and their environmental niches, are summarised below.

Description	Lithology and Soils	Environmental Niches
Blakely's Red Gum/Yellow Box valley floor grass-forb forest	Moderately deep clay loams derived from metamorphic or deep marine sediments	Very limited within the reserve. More common on lower slopes and broad valley floors
Black Cypress Pine/Dwyers Red Gum low woodland	On skeletal to shallow soils derived from granite	Western escarpment and exposed slopes of Mudjarn NR
Sheltered Slopes Nortons Box/Red Box/Black Cypress Pine grass-forb-lily open Forest	On shallow soils derived from granite	Eastern slopes of Mudjarn NR

Source: EcoGIS (2002)

Diversity of the forest mid and understorey is low. It is thought that a number of factors have combined to cause this, namely, grazing by native and introduced animals and the thick stands of cypress pine that are thought to suppress herbaceous plant growth through competition for light and nutrients.

The cypress within the reserve is of a similar age and appears to exist at a higher density than would naturally occur. Cypress pine is susceptible to damage from grazing by both native and introduced animals and fire (J Briggs pers. comm.). It is thought that grazing by rabbits suppressed growth of the seedlings during plague times in the 1940s and 1950s. The introduction of myxomatosis in the 1950s and resulting decrease in rabbit populations are thought to have led to the proliferation of cypress seedlings, resulting in the density and structure that is seen today (J McGruer, pers.comm.).

Due to large scale land clearing for agriculture, gathering of native timber from within and around the reserve for fencing materials and firewood, and grazing, the vegetation within the park is highly disturbed and is not representative of the diversity or structure that would have existed prior to European settlement. However, given the lack of similar vegetation types in the region, the existing diversity in the vegetation of the nature reserve is considered to be significant.

Of interest is the existence of small pockets of yellow box and red gum woodland in and around the reserve. These species are a component of the endangered *White Box Yellow Box Blakely's Red Gum Woodland* that is listed on Schedule 1 of the *Threatened Species Conservation Act 1995*.

The reserve's native vegetation has been used for a number of purposes by both Aboriginal and non-Aboriginal people of the area. In the early 1900s cypress pine was selectively harvested from in and round the reserve and milled for the purpose of construction of houses, buildings and facilities. The original Brungle Aboriginal Mission was originally constructed using timbers harvested from around Mudjarn. Other uses include timber for canoes, didgeridoos, firewood and fencing materials.

### 2.3.3 Native Animals

Systematic fauna surveys conducted during 2001 (NPWS) and a search of the Atlas of NSW Wildlife reveals that Mudjarn Nature Reserve is important as an island habitat for a diverse range of native species. Its significance as native animal habitat is high, given that the surrounding lands have been altered for agriculture and forestry. A total of 9 species of mammals, 4 frogs, 7 reptiles and 153 species of birds have been recorded, although it is likely that other species exist in and around the reserve.

Threatened bird species known to exist in the area include:

Scientific Name	Common Name	Legal Status
<i>Ninox strenua</i>	Powerful Owl	V
<i>Ninox connivens</i>	Barking Owl	V
<i>Oxyura australis</i>	Blue-billed Duck	V
<i>Climacteris picumnus</i>	Brown Treecreeper	V
<i>Pyrrholaemus sagittatus</i>	Speckled Warbler	V
<i>Stagonopleura guttata</i>	Diamond Firetail	V

V= Listed as Vulnerable on Schedule 1 of the Threatened Species Conservation Act, 1995

Mammals recorded in the reserve include:

Scientific Name	Common Name
<i>Ornithorhynchus anatinus</i>	Platypus
<i>Vombatus ursinus</i>	Common Wombat
<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum
<i>Acrobates pygmaeus</i>	Feathertail Glider
<i>Trichosurus vulpecula</i>	Common Brushtail Possum
<i>Macropus robustus</i>	Common Wallaroo
<i>Chalinolobus morio</i>	Chocolate Wattled Bat
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat
<i>Hydromys chrysogaster</i>	Water Rat

Amphibian species recorded in the reserve include:

Scientific Name	Common Name
<i>Crinia parsignifera</i>	Eastern Sign-bearing Froglet
<i>Limnodynastes dumerilii</i>	Bullfrog
<i>Litoria latopalmata</i>	Broad-palmed Frog
<i>Litoria peronii</i>	Peron's Tree Frog

Reptile species recorded in the reserve include:

<b>Scientific Name</b>	<b>Common Name</b>
<i>Varanus varius</i>	Lace Monitor
<i>Carlia tetradactyla</i>	Southern Rainbow-skink
<i>Egernia striolata</i>	Tree-crevice Skink
<i>Hemiergis decresiensis</i>	Three-toed Earless Skink
<i>Morethia boulengeri</i>	South-eastern Morethia skink
<i>Pseudemoia entrecasteauxii</i>	Tussock Cool-skink
<i>Pseudonaja textilis</i>	Eastern Brown Snake

Local Aboriginal people traditionally hunted in and around the reserve for possum, echidna, wallaby, goanna and bandicoot. "Sugar Gums" (possibly Blakely's Red Gum) were a good source of witchetty grubs, a favoured food source for local Aboriginal people (V Bulger pers.comm.).

## **2.4 CULTURAL HERITAGE**

### **2.4.1 Aboriginal Heritage**

Aboriginal people in the Tumut area primarily affiliate with the Wiradjuri language group which covers the majority of NSW South West Slopes and also includes parts of the Upper Murray, Murrumbidgee, Lachlan and Macquarie catchments. However, at the time of European settlement the Tumut area was the meeting point between the Ngunawal (north east), Walgalu (south-east) and Wiradjuri (western) languages (Rimas Kabaila, 1995). Tumut is also known to have links with the Dharawal and Yuin people (Howitt, 1904), with coastal people coming up to the Tumut area for ceremonies. Early explorers recorded Aboriginal camps within the river valleys and on flood plains (Navin & Officer, 1998), and this pattern of use is supported archaeologically within the Tumut area. Whereas the valleys were a focus for living, the high peaks and hills are associated with ritual, and initiations are known to have occurred within the ranges and hills, including Mudjarn, until the 1920s (Sams, 1982; Read, 1988; Rimas Kabaila, 1995).

A number of Aboriginal sites have been recorded in the area. Recent surveys (Knight, 2004) undertaken within the reserve by NPWS with the assistance of local Aboriginal community members, found two isolated artefacts and one artefact scatter in addition to a stone cairn that is thought to be of Aboriginal origin. There are also reports of an Aboriginal stone arrangement existing outside, but very close to, the reserve boundary, and pre-contact burials are known to occur outside the now Brungle cemetery along the ridge below Mudjarn Nature Reserve (Sams, 1982). In addition, Mudjarn forms part of a 'cultural landscape' that is of significant spiritual value to both the men and women of the local Aboriginal community.

Aboriginal people were also employed on properties near the reserve prior to reservation. Between the 1920s and 1970s, local Aboriginal people were employed by local landholders to collect timber from within and around the reserve for fencing and firewood. In addition, clearing of the surrounding land for grazing was also carried out with the assistance of paid local Aboriginal community members. It has been reported by local community members that at around the turn of the century a hut existed in the

north of the reserve providing shelter for a number of Aboriginal people employed to work on nearby farms.

#### **2.4.2 Non-Aboriginal Heritage**

The reserve lies within the parishes of Brungle and Killimicat in the County of Buccleuch.

Three mine sites have been identified within the reserve. These consist of either open horizontal shafts or timber lined vertical shafts. Associated with these mine sites are mullock heaps and shallow test pits in the vicinity of the larger shafts. Timber for lining of the vertical shafts was locally sourced. The mine sites are generally in poor condition having not been maintained since use ceased, sometime around the early to mid twentieth century. Knight (2004) suggests that the mines are representative of small-scale extraction of high value ore, such as gold, copper and molybdenum, which was in sufficient quantities to justify the effort of manual excavation through solid rock in difficult terrain.

Grazing and timber collection for firewood and fencing materials were allowed in the reserve under permit from the then Department of Land and Water Conservation up until the reserve's gazettal as nature reserve in 2001. Evidence of these activities exists within the reserve.

An old timber post and rail fence has been located within and continuing outside of the eastern side of the reserve. The fence is thought to be around 50 years old, and was originally part of a much larger fence line (Col Pearce pers.comm.).

### **2.5 THREATS TO RESERVE VALUES**

#### **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 very few recorded wildfires within the reserve since European settlement. One wildfire is known to have burnt out the whole of the reserve in the 1950s (V Bulger & J McGruer, pers. comms.).

There are a number of assets that border the reserve, with the main ones being those associated with agriculture including homesteads, vineyards, sheds, yards and machinery.

The NPWS uses a zoning system for bushfire management in NPWS reserves. NPWS zones are compatible with the system adopted by the Bushfire Coordinating Committee for use in District Bushfire Management Committee (DBFMC) bushfire risk management plans.

NPWS has assessed the reserve for fire management planning purposes and has zoned the reserve as a Heritage Area Management Zone (HAMZ). The primary fire

management objectives within this zone are to protect the threatened species associated with the open forest and woodland communities and Aboriginal sites and landscapes within the reserve. The reserve has been designated as a HAMZ because it is not adjacent to major built assets which would be exposed to a high level of bushfire risk, and does not have a history of frequent bushfire ignitions or known areas of high bushfire behaviour potential. The HAMZ does not require intensive management and focuses on those actions appropriate to conserve biodiversity and cultural heritage. The use of planned fire in the reserve will only be carried out if required for research, ecological or hazard reduction purposes.

NPWS maintains cooperative arrangements with surrounding landowners and Tumut and Brungle Rural Fire Service brigades and is actively involved in the Tumut Bush Fire Management Committee. Cooperative arrangements include approaches to fuel management, support for neighbours fire management efforts and information sharing.

### **2.5.2 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. The NPWS also has a priority to control environmental weeds (not necessarily declared noxious) which threaten natural habitats.

Weeds alter soil chemistry and compete with native species for space and dominance. A number of weed species exist in the reserve, but not as large single-species infestations. Permit grazing in the reserve occurred for a number of years assisting the introduction of pasture species with a consequent reduction in native species diversity.

The NPWS South West Slopes Region Pest Management Strategy (2004) identifies priority pest species and programs for action through set criteria. By following this same 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 strategic approach 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.

Introduced plant species recorded in the reserve include St. John's wort (*Hypericum perforatum*), Paterson's curse (*Echium plantagineum*), Viper's bugloss (*Echium vulgare*), blackberry (*Rubus fruticosus*), Saffron thistle (*Carthamus lanatus*), briar rose (*Rosa rubiginosa*) and a number of pasture grass species.

### **2.5.3 Introduced Animals**

An introduced animal species is defined in this plan as any animal species not endemic to the reserve. Introduced animals may impact upon native fauna populations through predation or competition for food or shelter. Introduced animals known in the reserve include rabbits and foxes, although other species may exist. Both species are managed in accordance with the actions listed in the regional pest management strategy. Rabbits

have presented a problem in the past, however, it is thought that a combination of myxomatosis and baiting, trapping and shooting programs have reduced rabbit populations to an acceptable level. Foxes inhabit the reserve, as they do throughout the South West Slopes. Cooperative control programs between landholders, Gundagai Rural Lands Protection Board and the Service will be implemented as necessary.

## 2.6 ACCESS AND USE

There is no public vehicular access to the reserve and at present pedestrian access is limited. The reserve has no visitor facilities, is infrequently used by the public and is surrounded by freehold private land. A number of crown road easements provide potential access to the western boundary, but roads have never been constructed within these easements. Due to the steepness of the reserve, only one management trail exists, with the majority of this trail located outside of the reserve. Access for management operations is currently under informal agreement with neighbouring landholders.

Boundary fences are in varying states of repair and negotiations are continuing with adjoining landholders to repair and erect fences where necessary.

Known prior use by the public includes limited bushwalking, camping and nature appreciation activities.

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### **Personal Communications**

Alice Williams – Brungle Aboriginal community member

Vince Bulger – Wiradjuri elder

John McGruer – Neighbour and long time resident

Col Pearce – Neighbour



### 3. MANAGEMENT ISSUES AND STRATEGIES

Current Situation	Desired Outcomes	Strategies	Priority
<p><b>Soil and water conservation</b></p> <p>The soils of the reserve are prone to erosion when exposed.</p> <p>No permanent water exists within the reserve, although Killimicat Creek forms the far southern boundary of the reserve for 1km.</p>	<p>Soil erosion is minimised.</p>	<p>Undertake all works in a manner that minimises erosion and water pollution.</p> <p>Monitor erosion outbreaks in the reserve and treat where necessary.</p>	<p>High</p> <p>Low</p>
<p><b>Native plant and animal conservation</b></p> <p>Vegetation survey and mapping undertaken by NPWS have revealed no threatened flora species, but the reserve contains small sections of red gum and yellow box, which are part of a listed endangered ecological community.</p> <p>A number of threatened fauna species are known to use the reserve as part of a broader home range.</p> <p>It is important that remnant vegetation on neighbouring lands is conserved in order to provide suitable habitat links for native fauna.</p>	<p>All native plant and animal species and communities are conserved.</p> <p>Structural diversity and habitat values are restored in areas subject to past disturbance.</p>	<p>Monitor vegetation change following the removal of cattle and sheep grazing from the reserve. Establish photo monitoring plots in the reserve and conduct vegetation surveys at these sites at least once every 5 years.</p> <p>Work with neighbours and vegetation management committees to encourage conservation of remnant native vegetation in the vicinity of the reserve.</p> <p>Encourage research and survey of the reserve's plant and animal communities.</p>	<p>High</p> <p>Med</p> <p>Low</p>

Current Situation	Desired Outcomes	Strategies	Priority
<p><b>Introduced species</b></p> <p>Due to the relatively stable nature of the reserves soils when covered by an intact layer of native vegetation, the potential for infestations of new weeds in the reserve is low.</p> <p>Rabbits and foxes exist in and around the reserve.</p>	<p>The impact of introduced species on native species and neighbouring lands is minimised.</p>	<p>Control introduced plant and animal species. Priority will be given to control of blackberry, St. John's wort, saffron thistle and sweet briar in the eastern part of the reserve. Cooperative fox control programs will be undertaken when necessary.</p> <p>Seek the input of other authorities and neighbours in implementing cooperative weed and pest animal control programs.</p>	<p>High</p> <p>High</p>

Current Situation	Desired Outcomes	Strategies	Priority
<p><b>Fire management</b></p> <p>Fire history and frequency within the reserve and immediate area is not well known. Fire scars are not visible or easily identified within the reserve. Local RFS members and neighbours have only reported one known fire in the 1950s.</p> <p>Due to the distance of the reserve from Tumut, RFS and neighbours will most likely undertake the first response to fires within and around the reserve.</p> <p>Fire is a natural feature of the environment of the reserve and may be essential to the survival of some plant communities. Frequent or regular fire, however, can cause loss of particular plant and animal species and communities. Fire could also damage cultural features and fences and threaten neighbouring land.</p> <p>The native Cypress pine is susceptible to fire. Uncontrolled wildfire in the reserve could threaten the existing structure and diversity of this forest type within the reserve.</p>	<p>Persons and property are protected from bushfire. Natural and cultural features are protected from damage by fire</p> <p>A cooperative approach is developed for fire management with neighbours and other fire authorities.</p> <p>Fire regimes require further investigation for conservation of plant and animal communities.</p>	<p>Implement the Fire Management Strategy for the reserve.</p> <p>Contain all unplanned fire events as soon as possible by rapidly responding to reported ignitions.</p> <p>Use appropriate bushfire suppression techniques to protect life, property, natural and cultural heritage.</p> <p>Participate in Tumut Bush Fire Management Committee. Maintain coordination and cooperation with RFS brigades, Fire Control Officers and neighbours with regard to fuel management and fire suppression.</p> <p>Encourage further research into the ecological effects of fire in the reserve, especially for regeneration purposes and for preserving the integrity of the native plant and animal communities.</p>	<p>High</p> <p>High</p> <p>High</p> <p>High</p> <p>Low</p>

Current Situation	Desired Outcomes	Strategies	Priority
<p><b>Cultural heritage</b></p> <p>The reserve is very important to the local Aboriginal community. This significance is brought about through traditional, historic and contemporary associations between Aboriginal people and their environment.</p> <p>A number of Aboriginal sites and landscape features have been identified within and around the reserve.</p> <p>A stone cairn exists within the reserve that is thought to be of Aboriginal origin.</p> <p>An old post and rail fence is located in the eastern section of the reserve.</p> <p>A number of disused mine sites exist in the east of the reserve.</p>	<p>Aboriginal and historic features and values are identified and protected.</p> <p>Aboriginal people are involved in management of the Aboriginal cultural values in the park.</p> <p>Understanding of the cultural significance of the park is improved.</p>	<p>Precede all new ground disturbance work by an assessment for cultural features.</p> <p>Consult and involve the Tumut-Brungle Local Aboriginal Land Council, the Snowy Mountains Elders group and other relevant Aboriginal community organisations in the management of Aboriginal sites, places and values within the nature reserve.</p> <p>Encourage further research into the cultural heritage values of the reserve in close consultation with key stakeholders and community members.</p> <p>Assess the significance of the stone cairn through research and oral history collection.</p> <p>Protect the post and rail fence from fire.</p> <p>Undertake a risk and safety assessment to determine the structural stability of the mines and undertake stabilisation works if necessary.</p>	<p>High</p> <p>High</p> <p>Medium</p> <p>Low</p> <p>Medium</p> <p>Medium</p>

Current Situation	Desired Outcomes	Strategies	Priority
<p><b>Visitor use</b></p> <p>Visitor use of the reserve is limited.</p> <p>Aboriginal community members wish to obtain permanent pedestrian access to the reserve.</p>	<p>The local community is aware of the significance of the area and of management programs.</p>	<p>Work with key stakeholders, neighbours and the Aboriginal community with a view to arranging public pedestrian access to the reserve.</p> <p>Allow individual and organised group cultural and/or educational visits, subject to limits on numbers and other conditions if necessary to minimise impacts.</p> <p>Liaise with Tumut Shire Council, landholders and community members to investigate the possibility of providing car parking, signage and pedestrian access to the reserve from Brungle Road.</p>	<p>High</p> <p>Medium</p> <p>Medium</p>
<p><b>Management operations</b></p> <p>Management access is by local agreement with landholders.</p> <p>The reserve boundary is fenced to varying standards.</p>	<p>Management facilities adequately serve management needs and have acceptable impact.</p> <p>Domestic stock do not enter the reserve.</p>	<p>Work with neighbours with a view to arranging formal management access to the reserve</p> <p>In conjunction with neighbours, maintain boundary fences to exclude domestic stock from the reserve.</p>	<p>High</p> <p>High</p>

**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.