NSW National Parks and Wildlife Service

Woomargama National Park, Woomargama State Conservation Area, Mullengandra Nature Reserve and Mullengandra State Conservation Area

Plan of Management

Department of
Environment, Climate Change and Water NSW

WOOMARGAMA NATIONAL PARK, WOOMARGAMA STATE CONSERVATION AREA, MULLENGANDRA NATURE RESERVE AND MULLENGANDRA STATE CONSERVATION AREA

PLAN OF MANAGEMENT

NSW National Parks and Wildlife Service

Part of the Department of Environment, Climate Change and Water

November 2009

This plan of management was adopted by the Minister for Climate Change and the Environment on 1st November 2009.

Acknowledgments

The NPWS acknowledges that these parks are located within the traditional country of the Wiradjuri people.

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

Valuable information and comments were provided by Service specialists, the Regional Advisory Committee and members of the public.

Data collection and field investigations undertaken by Mark Butz, NPWS Ranger Naturalist (1978) were heavily sourced in producing this document.

Cover photograph: View from Norths Lookout on the Hume and Hovell Walking Track by Jo Caldwell, NPWS.

For additional information or inquiries about these reserves or this plan, contact the NPWS South West Slopes Regional Office at 7 Adelong Rd (PO Box 472) Tumut 2720 or by phone on (02) 6947 7000.

ISBN 978 1 74232 486 9

DECCW 2009/760

FOREWORD

Woomargama National Park, Woomargama State Conservation Area, Mullengandra Nature Reserve and Mullengandra State Conservation Area are located approximately 20 kilometres south-east of Holbrook and 30 kilometres north-east of Albury on the South West Slopes of NSW.

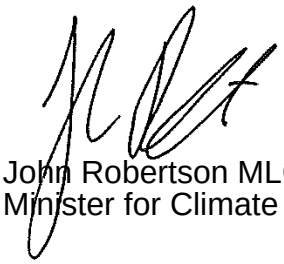
The reserves protect an area of highly diverse forest and woodland communities on the northern and western extent of an almost continuous belt of vegetation between south-east NSW and northern Victoria. They support a high diversity of flora and fauna communities, including seven threatened plants and up to twenty five threatened animals, some of which are at the limit of their western distribution.

The reserves contain a number of important Aboriginal sites, linking the reserves with other significant sites in the region, and remnants of mining, forestry and agricultural activities. The Hume and Hovell Walking Track passes through Woomargama.

The New South Wales *National Parks and Wildlife Act 1974* requires that a plan of management be prepared for each national park, nature reserve and state conservation area. A draft plan of management for Woomargama National Park and Reserve and Mullengandra Nature Reserve and Reserve was placed on public exhibition from 15th December 2006 until 26th March 2007. The submissions received were carefully considered before adopting this plan.

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 closure and rehabilitation of a former quarry site, control of introduced plants and animals, and fire management strategies. The plan also contains a number of actions to help achieve Priority E8 in the State Plan “More people using parks, sporting and recreational facilities, and participating in the arts and cultural activity”, including provision of camping areas, and involvement of the local Aboriginal community in the development of material and programs for interpretation of Aboriginal culture.

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



John Robertson MLC
Minister for Climate Change and the Environment

CONTENTS

1. INTRODUCTION

1.1 LOCATION, GAZETTAL AND REGIONAL SETTING

Woomargama National Park, Woomargama State Conservation Area, Mullengandra Nature Reserve and Mullengandra State Conservation Area are located approximately 20 kilometres south-east of Holbrook and 30 kilometres north-east of Albury on the South West Slopes of NSW. They are located immediately north of the Murray River, which forms the NSW/Victorian border. Woomargama National Park is comprised of 24,185 hectares and Woomargama State Conservation Area of 7,120 hectares. Mullengandra Nature Reserve is comprised of two portions totalling 150 hectares and Mullengandra State Conservation Area is 258 hectares in size (see map, centre pages). In most cases in this document, "the reserves" refers to Woomargama and Mullengandra collectively. However, when referring to the reserves individually, Woomargama National Park and State Conservation Area are referred to as "Woomargama" and Mullengandra Nature Reserve and State Conservation Area as "Mullengandra".

Woomargama National Park and Mullengandra Nature Reserve were gazetted in 2001 as part of the Southern Regional Forest Agreement (2000). They are made up of the former Woomargama, Dora Dora and Tipperary State Forests, as well as various portions of former crown land, previously held under various lease agreements. The name Woomargama is derived from the village to the park's north. It is also possibly of Aboriginal origin derived from the word "wombariga" meaning native cherry, which is found throughout the region (Andrews, 1920). The name Mullengandra is derived from the village north of the nature reserve. It is also thought to have an Aboriginal origin, although the exact meaning of the word is not clear.

Two areas of Woomargama State Forest and a small section of Crown land near Mullengandra were, under Schedule 4 of the *National Park Estate (Southern Region Reservations) Act 2000*, dedicated as Crown Reserves under the *Crown Lands Act 1989*. These Crown Reserves were gazetted as state conservation areas in 2009.

The main land use in the area is agriculture, including cropping and grazing, and pine forestry. The surrounding country has been extensively cleared for sheep and cattle grazing which commenced in the mid-nineteenth century, clearing continuing through to at least World War II (Pearson, 2002). Privately owned pine plantations border the east and west boundaries of Woomargama. The reserves form part of the western extent of a broader vegetated belt of land stretching from Kosciuszko National Park and beyond in the east and from reserved lands across the border in Victoria.

The reserves are within the administrative area of Greater Hume Shire Council, the Hume Livestock Health and Pest Authority, and the Murray River Catchment Management Authority.

Also included in Woomargama are several roads that are vested in the Minister 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 Woomargama. 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 was

gazetted could continue. The NPE Act provides that, following assessment, these roads must be either added to, or excluded from, the park.

A number of apiary licenses are held for sites within Woomargama National Park and State Conservation Area. These licenses were granted prior to the gazettal of the park. In line with the NPE Act the holders of these apiary licenses are recognised as having existing interest in the reserve, therefore these sites will be maintained until the end of the current license. Licenses cannot be transferred.

1.2 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 reserves protect an area of highly diverse forest and woodland communities on the northern and western extent of an almost continuous belt of vegetation between south-east NSW and northern Victoria. The forests support a suite of native fauna, some of which are at the limit of their western distribution. The reserves are situated in the transition zone between the mountainous NSW South West Slopes and the broader plains of the Riverina.

The geology, landform, climate and plant and animal communities of the area, plus its location, have determined how it has been used by humans. Large-scale forestry and agricultural practices in the area have modified the landscape surrounding the reserves, and to a lesser extent within them. Previous uses of the reserves have been grazing, timber harvesting and recreational use. The Aboriginal significance of the reserves is not clear, however a study undertaken by Barber (2001) in Woomargama identified a number of sites, indicating some form of past occupation by Aboriginal people. The fire history of Woomargama is well documented with evidence of frequent low and high intensity fires existing within and surrounding the park. Low-key recreational use occurs in Woomargama and consists of vehicle touring, bush walking, camping and nature appreciation activities. A comprehensive network of trails provides access for management and recreation.

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. MANAGEMENT CONTEXT

2.1 LEGISLATIVE AND POLICY FRAMEWORK

The management of national parks, nature reserves and state conservation areas in NSW is in the context of the legislative and policy framework, primarily of the *National Parks and Wildlife Act 1974* (NPW Act), the *Threatened Species Conservation Act 1995* (TSC Act) and the policies of the National Parks and Wildlife Service (NPWS). 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* may require the assessment and mitigation of the environmental impacts of works proposed in this plan.

A plan of management is a statutory document under the NPW Act. Once a plan has been adopted, no operations may be undertaken within Woomargama National Park, Woomargama State Conservation Area, Mullengandra Nature Reserve or Mullengandra State Conservation Area except in accordance with the plan. This plan will also apply to any future additions to the reserves. Where management strategies or works are proposed for the reserves, or any additions that are not consistent with the plan, an amendment to the plan will be required.

2.2 MANAGEMENT OBJECTIVES

Objectives for National Parks

Under the NPW Act (Section 30E) national parks are managed to:

- conserve biodiversity, maintain ecosystem functions, protect geological and geomorphological features and natural phenomena and maintain natural landscapes;
- conserve places, objects, features and landscapes of cultural value;
- protect the ecological integrity of ecosystems for present and future generations;
- promote public appreciation and understanding of the park's natural and cultural values;
- provide for sustainable visitor use and enjoyment that is compatible with conservation of natural and cultural values;
- provide for sustainable use (including adaptive reuse) of any buildings or structures or modified natural areas having regard to conservation of natural and cultural values; and
- provide for appropriate research and monitoring.

National parks are part of the regional pattern of land use. Management of national parks aims to minimise disturbance to natural and cultural heritage. Other land uses, for example agriculture, forestry and mining, are distinguished by an acceptance or

encouragement of environmental modification. National parks, therefore, provide for only a limited part of the range of land uses in a region.

Objectives for 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 (Section 30J), 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.

Objectives for State Conservation Areas

State conservation areas (SCAs) are reserved under the NPW Act to protect and conserve areas that contain significant or representative ecosystems, landforms or natural phenomena or places of cultural significance; that are capable of providing opportunities for sustainable visitor use and enjoyment, the sustainable use of buildings and structures or research; and that are capable of providing opportunities for uses permitted under other provisions of the Act.

Under the Act (Section 30G), SCAs are managed to:

- conserve biodiversity, maintain ecosystem functions, protect natural phenomena and maintain natural landscapes;
- conserve places, objects and features of cultural value;
- provide for the undertaking of mining, having regard to the conservation of the natural and cultural values of the area;
- provide for sustainable visitor use and enjoyment that is compatible with conservation of the area's natural and cultural values and with uses permitted in the area;
- provide for sustainable use (including adaptive reuse) of any buildings or structures or modified natural areas having regard to conservation of the area's natural and cultural values and with other uses permitted in the area; and
- provide for appropriate research and monitoring.

The Act also requires review of the classification of SCAs every 5 years to determine whether they should or should not receive either a national park or nature reserve classification. The classification review for SCAs is described in section 47M of the

NPW Act and is undertaken in consultation with the Minister administering the *Mining Act 1992*. It is anticipated that these reserves will be added to the national park and nature reserve once the mineral resource objections to reservation have been withdrawn. In the meantime they will be managed as far as possible consistent with the objectives above as if they are part of the national park and nature reserve.

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 agreed to work towards a shared vision for Australia's forests. This aimed 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 RFAs that provide, amongst other things, for Ecologically Sustainable Forest Management (see section 7).

The Southern Regional Forest Agreement (2000) covers most of the South West Slopes administrative region. The process leading up to the RFA provided for major additions to the reserve system, including establishment of Woomargama National Park and State Conservation Area and Mullengandra Nature Reserve and State Conservation Area.

3. KEY VALUES AND MANAGEMENT DIRECTIONS

3.1 VALUES OF THE AREA

The reserves are of regional significance for their cultural heritage, recreation, biological and landscape values.

Key **natural values** include:

- cliff lines, scarps, tors and rock shelves formed in granite outcrops,
- a high diversity of flora and fauna communities within a small geographic area, including seven threatened plants and up to twenty five threatened animals.

Significant **scenic values** include:

- spectacular views of the Riverina to the north and west from prominent cliff lines and hill tops,
- views of the Upper Murray valley and Snowy Mountains to the south and east.

The key **cultural heritage values** include:

- a number of important Aboriginal sites, linking the reserves with other significant sites in the region,
- remnants of mining, forestry and agricultural activities within and adjacent to the reserves. Remnants include dams, races, a Cornish chimney and smelter remains, and remains of old machinery, fences, huts and ruins.

Recreation and tourism values include:

- the Hume and Hovell Walking Track passes through Woomargama,
- the road network in Woomargama provides opportunities for vehicle-based touring and camping.

3.2 MANAGEMENT DIRECTIONS

Management of the reserves will focus on the protection of significant vegetation communities and habitats, the protection of threatened flora and fauna populations, the protection of Aboriginal and European historic heritage sites, management of fire and the provision of recreation and scientific opportunities and facilities.

Major strategies to achieve the management objectives are:

- Undertake further targeted survey of rare, declining and threatened flora and fauna and mapping of their range and distribution within the reserves;

- Protect significant vegetation communities and habitats from fire by modifying fire frequency, maintaining park roads and fire advantages, and the preparation of a Fire Management Strategy (including Fire Operations Map) prescribing fire management guidelines and strategies;

- Co-operate with the NSW Rural Fire Service, bushfire committees and the local community on fire management and suppression in the reserves;

- Manage key issues, including Aboriginal heritage, in consultation with relevant local Aboriginal and non-Aboriginal community members;

- Develop and implement on-going weed and pest animal control programs in cooperation with neighbours and relevant agencies; and

- Protect the heritage value of the mining remains and provide facilities and interpretation for visitors at these sites.

- Provide sustainable recreation opportunities for a variety of interest groups and community members.

4. CONSERVATION OF NATURAL AND CULTURAL HERITAGE

4.1 GEOLOGY AND LANDFORM

The reserves are situated on the Lachlan Fold Belt. This geological formation extends from south-east to central NSW and covers up to one-third of NSW. Within this fold belt lies the Wagga Metamorphic Belt within which the reserves are situated. The majority of the reserves are comprised of steeply sloping Silurian Koetong Granite, which exhibits many exposed rock faces and tor formations on ridge crests. Surrounding the granites are patches of Ordovician metasediments that tend to erode more readily such as in the Narra Narra and Lankeys Creek area. A third major component of the geology of the reserves is the accumulation of Quaternary alluvium in major drainage channels. Along the Murray River these form extensive flats and floodplains, while the other major occurrences extend to around Holbrook. Where the alluviums meet the granites, a striking contrast in relief, and often land use occurs. It is on these geological boundaries that the park boundary generally lies (Butz, 1978).

Much of the Wagga Metamorphic Belt is characterised by deposits of tin, tungsten and small gold deposits. Smaller deposits of molybdenum, bismuth, fluorite and wolfram also occur. This has led to exploration and mining of these minerals in the past. Evidence of these activities exists throughout the reserves.

The Woomargama region is a scenic area, providing a mountainous and timbered backdrop to the low-lying areas of the Murray River plain and the rich agricultural plains around Holbrook. In the middle of Woomargama National Park, a flat expanse known as the “Tin Mines” exists. This flat provides a scenic appreciation of the eucalypt forests found in the park, as well as an opportunity for camping and picnicking.

Desired Outcomes

- The scenic and aesthetic values of the reserves are protected.

Strategies

- Maintain the open and grassy character of the Tin Mines. This will require periodic weed spraying to control pasture species and weeds in the area.

- Ensure works and facilities planned for the reserves do not compromise aesthetic and scenic values.

4.2 NATIVE PLANTS

One of the most significant features of the reserves is the diversity of forest ecosystems contained within them. EcoGIS (2004) undertook significant vegetation surveys and formulated vegetation maps for the reserves. Up to 13 distinct forest ecosystems were identified within the reserves. Some of these forest types are considered significant as they remain relatively intact in the reserves and have been extensively cleared from surrounding agricultural areas. A summary of these vegetation types and their environmental niches is shown below.

Description	Lithology and Soils	Environmental Niches
Black Sallee open woodland	Organic soils on granitic flats	Restricted to flats with impeded drainage.
Apple Box moist sedge/grass/herb forest	Deep silty clay loams derived from colluvium on either granite or metamorphic sedimentary rocks	On flat areas adjoining drainage lines with eastern and southern aspects, mainly in Mullengandra.
Norton's Box/Red Box/Apple Box moist grass forest	Shallow loams derived from granite	On lower slopes and gullies in NW part of Woomargama.
Broad-leaved Peppermint/Brittle Gum grass/herb forest	Shallow loams derived from granite	Restricted to north-western section of Woomargama.
Narrow-leaved Peppermint/Blue Gum/moist grass/forb forest	Moderately deep loams on Silurian granite and Ordovician sedimentary rocks	On sheltered southern and eastern aspects.
Swamp Gum moist sedge/herb woodland	On organic clay loams on a variety of substrates, mainly Silurian granite	On poorly drained flats, usually at elevations above 600 metres.
Norton's Box/White Box/Red Box grassy forest	Shallow clay loams on Silurian granite or Ordovician sandstone	Northern facing aspects, usually on steep slopes in middle and northern sections of both reserves.
Yellow Box/Blakely's Red Gum valley flats woodland	Moderately deep clays on flats.	Sheltered flats at lower elevations in central west of Woomargama NP and adjoining private property.
Norton's Box/Red Box grassy forest	Shallow-moderate clay loams on Leucogranites	Western slopes of both reserves.

Description	Lithology and Soils	Environmental Niches
Rough-barked Red Box/White Box dry shrub/forb open forest	Skeletal clay loams derived from granite on northern facing slopes on slopes greater than 15 degrees	Small pockets in centre, southern and northern boundaries of Woomargama adjoining private property
Black Cypress Pine/Dwyer's Red Gum low woodland	In fire shadow areas on rocky benches usually on sheltered slopes with infrequent fire history. Clay loam soils	On plateau shelves and eastern facing slopes of both reserves
Broad-leaved Peppermint/Norton's Box grassy forest	Shallow silty clays derived from Silurian granites. Contains an important population of phantom wattle *Acacia phasmoides*	Some occurrences in the central east of Woomargama, but more common in Mullengandra.
Escarpment Long Leaved Box (Black Cypress Pine) heath/shrub forest	On lithosols on Silurian granite	On exposed boulder slopes in north and south sections of Woomargama.

Source: EcoGIS (2004)

Given the intensity of study undertaken in the area since gazettal, a high degree of understanding of the forest types within the reserves exists. However, the degree to which disturbance from fire, grazing and timber harvesting has effected these ecosystems is not as well understood. It is believed, however, that the Black Cypress Pine – Dwyer's Red Gum low woodland, in particular, is sensitive to intense fires. Some sections of this forest type show effects from the 1985 fire.

The Phantom Wattle *Acacia phasmoides* and Woolly Ragwort *Senecio garlandii* occur in the reserves and are listed as vulnerable on the NSW *Threatened Species Conservation Act 1995* (TSC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act).

When finalised, recommendations made in recovery plans for all threatened flora species will be implemented in the reserves to ensure their survival into the future. In addition, a Priorities Action Statement (PAS) has been prepared that identifies strategies and actions to promote the recovery of threatened species, populations and ecological communities and manage key threatening processes, for species for which there is no recovery plan.

A National Recovery Plan for Phantom Wattle has been drafted by Victoria's Department of Sustainability and Environment (Sutter, 2005). The Phantom Wattle is found in the south of the reserve in one specific watercourse where Broad-leaved Peppermint/Norton's Box grassy forest dominates. This is the only known population of this species in NSW and one of only two populations in Australia. Out of a total known number of 405 plants in the wild, the Woomargama population accounts for 320 individuals, or 80% of the known distribution of this species. Threats to the

survival of the species include grazing by animals and high frequency, high intensity fire. The potential for the species to be affected by these threats in the park is considered to be low when managed as per recommendations listed in the draft recovery plan (Sutter, 2005). In addition, aerial culling of goats and maintenance of boundary fences will occur as necessary to protect the population in the park in the future in line with these recommendations.

Woolly Ragwort *Senecio garlandii* is found on the sheltered southern slopes of the reserves in various forest types. This species is not currently under threat within the reserves from human induced disturbance, but is generally rare throughout the region. Actions to recover this species listed in PAS refer to threats on private property, such as clearing.

Vegetation surveys undertaken in the reserves in late 2003 identified a new species recording for NSW, that being the diminutive annual trigger plant *Stylidium inundatum*. Though not listed as threatened, this species is considered rare locally.

Significant occurrences of old growth Yellow Box *Eucalyptus melliodora,* and Blakely's Red Gum *Eucalyptus blakelyi* occur in the central western sections of Woomargama. These are regarded as a component of the White Box/Yellow Box/Blakely's Red Gum woodland that is listed as an *Endangered Ecological Community* under the TSC Act. This forest type, in particular, is prone to weed invasion from St John's Wort and alteration due to inappropriate fire frequency (EcoGIS, 2004). In addition, this forest type occurs a short distance from private pine plantations. As these plantations mature and set seed, pine wildings are able to establish quickly in this community.

The invasion of native plant communities by exotic perennial grasses is listed as a *Key Threatening Process* under the TSC Act. St John's Wort *Hypericum perforatum* and Paterson's Curse *Echium plantagineum* are commonly occurring invasive weeds in the reserves and on surrounding lands. Continual monitoring and management strategies are required to control both species, as well as preventing new infestations from other species. Weed control is discussed in more detail in Section 5.3.

High frequency fire resulting in disruption of life cycle processes in plants and animals and loss of vegetation structure and composition is listed as a *Key Threatening Process* under the TSC Act. The prevention of frequent fire and protection of threatened and significant vegetation from fire are key objectives in the reserves.

Areas containing significant vegetation have been identified and will be protected from inappropriate fire frequency, impacts from visitor use and adverse impacts of management activities.

The forests of the reserves are linked through vegetated corridors to forest areas found to the south in Victoria, and to the east in NSW. The management of vegetation in the reserves should be considered in a broader context and not in isolation. Woomargama State Forest borders the eastern boundary of Woomargama National Park and extends the habitat quality and floral diversity values of the park.

Desired Outcomes

- The full range of native plant species found in the reserves is conserved.
- Vegetation structural diversity and habitat values are conserved.
- The threatened and significant communities are conserved.
- The habitat and populations of all significant plant species are protected.

Strategies

- Identify and protect the habitats of threatened species, particularly Phantom Wattle, and any other threatened vegetation species in accordance with actions listed in recovery plans and Priorities Action Statement.

- Enhance the value of the reserves by promoting the value of conservation of remnant vegetation through liaison with neighbours, the community, local council and appropriate government agencies.

- Identify and monitor potential local threats to the grassy box/gum woodland in the central west of Woomargama and implement measures to reduce the likelihood and significance of these impacts on the community.

4.3 NATIVE ANIMALS

NSW Wildlife Atlas records and systematic surveys carried out in 2001 and 2003 by NPWS reveal a high diversity of native animals and habitat types within the reserves. Some of the species listed below were recorded in the reserves up to 30 years ago and have not been recorded since then, for example the koala. Mammal species recorded in the reserves include:

Common Name	Scientific Name	Status
Short-beaked Echidna	*Tachyglossus aculeatus*	P
Yellow-footed Antechinus	*Antechinus flavipes*	P
Brown Antechinus	*Antechinus stuartii*	P
Common Brushtail Possum	*Trichosurus vulpecula*	P
Common Ringtail Possum	*Pseudocheirus peregrinus*	P
Eastern Pygmy-possum	*Cercartetus nanus*	V
Greater Glider	*Petauroides volans*	P
Squirrel Glider	*Petaurus norfolcensis*	V

Common Name	Scientific Name	Status
Sugar Glider	*Petaurus breviceps*	P
Feathertail Glider	*Acrobates pygmaeus*	P
Koala	*Phascolarctos cinereus*	V
Common Wombat	*Vombatus ursinus*	P
Swamp Wallaby	*Wallabia bicolor*	P
Red-necked Wallaby	*Macropus rufogriseus*	P
Eastern Grey Kangaroo	*Macropus giganteus*	P
Common Wallaroo	*Macropus robustus*	P
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V
White-striped Freetail-bat	*Nyctinomus australis*	P
Little Mastiff-bat	*Mormopterus planiceps*	P
Greater Long-eared Bat	*Nyctophilus timoriensis*	V
Gould's Long-eared Bat	*Nyctophilus gouldi*	P
Lesser Long-eared Bat	*Nyctophilus geoffroyi*	P
Gould's Wattled Bat	*Chalinolobus gouldii*	P
Chocolate Wattled Bat	*Chalinolobus morio*	P
Inland Broad-nosed Bat	*Scotorepens balstoni*	P
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	V
Southern Forest Bat	*Vespadelus regulus*	P
Little Forest Bat	*Vespadelus vulturnus*	P
Large Forest Bat	*Vespadelus darlingtoni*	P
Bush Rat	*Rattus fuscipes*	P

P=Protected, V=Vulnerable, E=Endangered

Bat diversity throughout the reserves is particularly high. This is thought to be due to the range of habitat types and floral diversity within the reserves and on surrounding lands.

Reptile species recorded within the reserves include:

Common Name	Scientific Name	Status
Eastern Stone Gecko	*Diplodactylus vittatus*	P
Jacky Lashtail	*Amphibolurus muricatus*	P
Warm-temperate Water-skink	*Eulamprus heatwolei*	P
Lace Monitor	*Varanus varius*	P
Copper-tailed Ctenotus	*Ctenotus taeniolatus*	P
Cunningham's Spiny-tailed Skink	*Egernia cunninghami*	P

Common Name	Scientific Name	Status
Tree-crevice Skink	*Egernia striolata*	P
Three-toed Earless Skink	*Hemiergis decresiensis*	P
Pale-flecked Garden Sunskink	*Lampropholis guichenoti*	P
Red-throated Cool-skink	*Bassiana platynota*	P
South-eastern Slider	*Lerista bougainvillii*	P
Cool-temperate Water-skink	*Eulamprus tympanum*	P
Common Bluetongue	*Tiliqua scincoides*	P
Blackish Blind Snake	*Ramphotyphlops nigrescens*	P
Small-eyed Snake	*Rhinoplocephalus nigrescens*	P
Red-bellied Black Snake	*Pseudechis porphyriacus*	P
Eastern Brown Snake	*Pseudonaja textilis*	P
Carpet Python	*Morelia spilota variegata*	P
Patternless Delma	*Delam inornata*	P
Southern Rainbow-skink	*Carlia tetradactyla*	P

P=Protected, V=Vulnerable, E=Endangered

Amphibian species recorded in the reserves include:

Common Name	Scientific Name	Status
Bullfrog	*Limnodynastes dumerilii*	P
Striped Marsh Frog	*Limnodynastes peronii*	P
Spotted Marsh Frog	*Limnodynastes tasmaniensis*	P
Bibron's Toadlet	*Pseudophryne bibronii*	P
Eastern Sign-bearing Froglet	*Crinia parinsignifera*	P
Common Eastern Froglet	*Crinia signifera*	P
Sloane's Froglet	*Crinia sloanei*	P
Booroolong Frog	*Litoria booroolongensis*	E
Southern Brown Tree Frog	*Litoria ewingii*	P
Peron's Tree Frog	*Litoria peronii*	P
Southern Bell Frog	*Litoria raniformis*	E

P=Protected, V=Vulnerable, E=Endangered

In addition, over 120 bird species have been recorded in the reserves. Eighteen of these are listed on the TSC Act. A comprehensive bird species list is provided in Appendix 1.

The following table shows threatened birds recorded in the reserves.

Common Name	Scientific Name	Legal Status
Superb Parrot	*Polytelis swainsonii*	V
Turquoise Parrot	*Neophema pulchella*	V
Diamond Firetail	*Stagonopleura guttata*	V
Freckled Duck	*Stictonetta naevosa*	V
Powerful Owl	*Ninox strenua*	V
Barking Owl	*Ninox connivens*	V
Brown Treecreeper	*Climacteris picumnus*	V
Speckled Warbler	*Chthonicola sagittata*	V
Painted Honeyeater	*Grantiella picta*	V
Black-chinned Honeyeater (Eastern subspecies)	*Melithreptus gularis gularis*	V
Regent Honeyeater	*Xanthomyza phrygia*	E
Barred Cuckoo-shrike	*Coracina lineata*	V
Painted Snipe (Aust. Subsp.)	*Rostratula benghalensis australis*	E
Bush Stone-curlew	*Burhinus grallarius*	E
Grey-crowned Babbler (Eastern subspecies)	*Pomatostomus temporalis temporalis*	V
Gang-gang Cockatoo	*Callocephalon fimbriatum*	V
Hooded Robin	*Melanodryas cucullata*	V
Pink Robin	*Petroica rodinogaster*	V

V=Vulnerable, E=Endangered

When finalised, recommendations made in recovery plans for all threatened fauna species will be implemented in the reserves to ensure their survival into the future. In addition, a Priorities Action Statement has been prepared that identifies strategies and actions to promote the recovery of threatened species, populations and ecological communities and manage key threatening processes, for species for which there is no recovery plan.

All records of native animals (and plants) are collected and stored on the Atlas of NSW Wildlife, a state-wide data base established by the Service. Information is built up about locality, habitat and breeding records and used to assist management of native wildlife.

Desired Outcomes

- The full range of native animal species found in the reserves is conserved.
- The habitat and populations of all threatened fauna species and biogeographically significant species are protected and maintained.

Strategies

- Protect the habitats of threatened fauna species and implement actions in recovery plans, where they exist, and in Priorities Action Statement for other threatened species and communities.

- Continue to record the distribution of threatened and significant fauna species through targeted survey and population monitoring.

4.4 ABORIGINAL HERITAGE

The strong attachment of Aboriginal people to the land is acknowledged. They may have cultural links with the whole landscape and specific locations. Individual places of significance may include living places, art sites, ceremonial sites, spiritual places and contact sites. Aboriginal sites and places are also important to non-Aboriginal people as they provide information about the past lifestyles of all humans.

While the Service presently has legal responsibility for the protection of Aboriginal sites and places it acknowledges the right of Aboriginal people to make decisions about their own heritage. It is therefore policy that Aboriginal communities be consulted and involved in the management of Aboriginal sites, places and related issues and the promotion and presentation of Aboriginal culture and history. The reserves are within the area of the Albury and District Local Aboriginal Land Council. There may also be other Aboriginal community organisations and individuals with an interest in the use and management of the reserves.

The reserves and the Albury Region are within an area identified as part of the Wiradjuri language group (Tindale, 1974).

The history of use of the area by Aboriginal people is not well understood. Surveys carried out by NPWS and Barber (2001) in Woomargama revealed a suite of sites of varying significance, but did not reveal the intensity of past use by Aboriginal people, nor its contemporary significance to Aboriginal communities.

Barber (2001) states that the pattern of sites located and analysed during his investigation suggests that the area was utilised by the local Aboriginal people in small transient groups predominantly for hunting and gathering, and possibly for ceremonial purposes. It is not clear whether the reserves were permanently inhabited, however it is highly likely that, given the food resources available nearby in the Murray River valley, they were an integral part of a broader habitable landscape.

A total of 47 Aboriginal sites have been recorded within Woomargama. Of major importance is an art site located under a rock overhang in the north of the park. The art is on a massive granite boulder under a steep bedrock slope. The art consists of

two panels with the main panel forming the back of the shelter. Bird tracks, kangaroo tracks and a human figure are depicted on the panel as well as a number of other unidentifiable marks. Protection and conservation of this site from any form of disturbance is of utmost importance to NPWS and local Aboriginal communities. The site was formally recorded and a monitoring program commenced in 2003. Monitoring is undertaken at the site to determine levels of deterioration in the colour and clarity of the art. The location of the site is not widely known and will not be publicly promoted. Similar art sites have also been recorded across the Victorian border in Mt Lawson State Park and Burrowa-Pine Mountain National Park.

Two scarred trees have been recorded in the south of Woomargama, but it is not clear whether the scars are of Aboriginal origin. The size and shape of the scars indicates their possible use for making canoes.

A number of artefact scatters were located during the surveys of 2001. These sites consisted of scatters containing between 1 and 31 individual items. The sites consist almost entirely of quartz flakes (94%) with smaller deposits of volcanic, tuff, silcrete, chert and quartzite flakes.

Knight (2001) examined the Wiradjuri association with high places where the spiritual world meets the secular world. Barber (2001) discussed the possibility that the locally high mountain peaks within the area, particularly those with names of an Aboriginal origin such as Wagra, Narra Narra and Maraket were places of spiritual significance.

The early explorers Hume & Hovell passed through the area but did not mention the presence of Aboriginal people, unlike other areas of the surrounding district where they met and spoke to a number of Aboriginal people.

A Conservation Management Plan has been written for Woomargama (Pearson, 2002). This plan outlines the Aboriginal and European cultural heritage significance of the park and provides management recommendations for each of the identified sites.

The Aboriginal significance of Mullengandra is not clear and no surveys for Aboriginal sites have been undertaken. Further study of the area is likely to provide a clearer picture of the past Aboriginal use, and contemporary significance of the reserves, to Aboriginal people.

Desired Outcomes

- Aboriginal sites and places, particularly the rock art site, are protected from damage.
- Aboriginal people are involved in management of Aboriginal cultural values in the reserves.

Strategies

- The art site will be conserved in accordance with recommendations outlined in the conservation management plan and the site monitoring report. This includes periodic photo monitoring of the art site, protection from fire by reducing fuels in the immediate vicinity of the overhang and not promoting its location to the public.

- Undertake further surveys for significant sites, including art sites and rock shelters, and liaise with relevant local Aboriginal communities to determine the cultural values of the reserves.

- Manage Aboriginal heritage in consultation with the Albury and District Local Aboriginal Land Council and other relevant Aboriginal community organisations.

- Ensure that visitors and facilities do not impact on any Aboriginal sites and places.

- Undertake a cultural assessment prior to all activities with the potential to impact on Aboriginal sites and places.

- Do not publicise the location of Aboriginal sites and places except where the agreement of relevant Aboriginal community organisations has been obtained.

4.5 HISTORIC HERITAGE

Woomargama and its surrounds contain historic places and landscapes of cultural significance, including the Jingellic and Upper Basin Creek tin mining areas. A number of sites associated with these areas are considered to be regionally significant given their rarity, intactness and age (Pearson, 2002).

The Jingellic Tin Mine, located on state forest and private land adjacent to Woomargama State Conservation Area in the south east, is of historical and technological significance because it includes elements demonstrating to a high degree the strategies for mining tin in the 1870s and 1880s. Evidence of this quality and intactness is now rare in the state, and in the country as a whole (Pearson, 2002).

The Upper Basin Creek tin mining area, including Bells Swamp, is significant because it is a largely intact complex of alluvial tin workings, representing both small and medium-scale mining from the 1870s through to the 1950s, and is a good example of its type (Pearson, 2002).

The first known European explorers to pass through the Woomargama area were Hamilton Hume and William Hovell in 1824. The Hume and Hovell party were on a government sponsored exploration of a route from Lake Bathurst to Spencer Gulf (which only got as far as Port Phillip), and passed to the north of the reserves, camping on Lankeys Creek then travelling and camping north of Mount Narra Narra. They then moved west to the Woomargama village site before heading south-west towards Albury. They named Friday Mount (later known as Mt Pleasant and now as Narra Narra, named for being sighted on Friday 12 November 1824), and Battery Mount (so named for ‘its very peculiar appearance’, now ‘Tabletop’), Battery Mount

Creek and Battery Mount Forest, as well as the Hume River (now Murray River) (Carnegie 1973, Feeken & Feeken 1970).

The majority of the area that is now Woomargama National Park was, up until 2001, managed by the then State Forests of NSW. Small-scale harvesting of hardwood sawlogs took place and two small spot-mills were established near the Basin Creek tin mine.

The predominant land use in the past in and around the reserves has been agriculture and pastoralism. Clearing occurred on the Murray River flats to the south of Woomargama and to the north up to a point where the land became too steep to clear. This vegetative boundary now broadly forms the boundary of Woomargama to the north and south. Fences within Woomargama provide evidence of former grazing lease boundaries, as well as delineation of the former State Forest boundaries.

A number of old huts and ruins in Woomargama provide evidence of former use associated with mining and grazing activities. The only standing buildings are Rex Beaver's Hut and Rabbiter's Hut.

A number of dams in Woomargama were used for both stock watering and to provide water for mining activities. Some of these dams still hold water, but most have long deteriorated to a point whereby water can no longer be stored. There is no permanent water in Mullengandra and no known historic sites.

Desired Outcomes

- All significant historic features are appropriately conserved and managed.
- The significance of the historic sites is interpreted to the public.

Strategies

- Record and manage all historic places in a way that is appropriate to their cultural significance in accordance with the Burra Charter of Australia ICOMOS.
- Rex Beaver's Hut will be managed in accordance with the Burra Charter.
- Rabbiter's Hut will be assessed and conserved if found to be significant.
- Selected sections of the Basin Creek tin mining field at "The Tin Mines" picnic area will be conserved and interpreted as per recommendations made by Pearson (2002). Visitors will be provided with information about the past mining use of the area and the history of the sluice hole.
- Liaison will be undertaken with Forests NSW regarding the on-going management of the historic structures associated with the former Jingellic Tin Mine.

5. PARK PROTECTION

5.1 SOIL EROSION

Changes in soil types in the reserves reflect the varying underlying parent materials upon which they are situated. The granites, which cover the majority of the area, tend to form soils that contain large quartz fragments. These soils are generally shallow on upper slopes and ridges, skeletal in rocky or exposed sites but can become quite deep on mid and lower slopes. Depending on the slope, soils vary from yellow to red podsolics and can contain a reasonable amount of organic matter. Where organic matter is particularly abundant, brown podsolic or "forest" soils can be found (Butz, 1978).

The Ordovician metamorphics tend to produce a similar soil to that of the granites, but they generally lack structure and are less developed than those of granitic origin.

All of these soil types lack a well-defined A-horizon and thus are particularly prone to erosion following disturbance events. The dryness of the country is not conducive to good vegetative protection of stream banks and there is little protection from erosion. Erosion gullies are present in locations within Woomargama and can generally be attributed to severe disturbance events such as high intensity fire, clearing, mining and road construction. Undisturbed soils in the reserves remain relatively intact. Road maintenance activities need to take into account this erosion potential when considering gravel selection, drainage and maintenance frequencies.

Desired Outcomes

- Human induced soil erosion in the reserves is minimised.

Strategies

- Manage former mining areas to minimise off site impacts and reduce progress of gullies where they are actively extending and leading to unacceptable off-site impacts.

- Design and undertake all road and facilities maintenance and construction works in a manner that minimises soil erosion.

5.2 WATER QUALITY AND CATCHMENT MANAGEMENT

The reserves lie within two major catchments, those being the Murray River and Billabong Creek catchments. In Woomargama, the Murray catchment is characterised by a short steep fall to the river some 600m below. Sub-catchments tend to be steep, narrow and confined by rocky ridges. The Billabong catchment in Woomargama is considerably more gentle after a steep initial fall from the granite block, and sub-catchments are a lot broader (Butz, 1978).

Many of the streams in the reserves are ephemeral and do not supply permanent water. Although erosion potential in the reserves is high, the vegetative cover

combined with lack of recent large-scale disturbance results in the production of water of a reasonably high quality. High intensity fire, road maintenance and other such broad-scale disturbance are threats to water quality.

The *Catchment Management Act 1989* provides a framework for achieving cleaner water, less soil erosion, improved vegetation cover, the maintenance of ecological processes and a balanced and healthier environment. It also provides a focus to balance conservation needs and development pressures and encourages a more aware and involved community. An important means of achieving these aims is the formation and support of catchment management authorities at a local level. The reserves are within the area of the Murray Catchment Management Authority.

Desired Outcomes

- The reserve's catchment values and the water quality are maintained.

Strategies

- Design and undertake all works in a manner that minimises water pollution.

- Liaise with local government and other authorities as needed to maintain the water quality of the reserve's catchments.

- Continue to implement recommendations made by, and participate as a member of the Murray Catchment Management Authority.

5.3 INTRODUCED SPECIES

An introduced species is defined in this plan as any plant or animal species not native to the reserves. Introduced species within the reserves 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. In addition, 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 South West Slopes Region has formulated a Pest Management Strategy for all reserves under its control. This strategy outlines the types of introduced species of plants and animals commonly occurring in the reserve network, strategies for their control, and priorities for the direction of funding to best achieve pest reduction targets. The strategy also outlines NPWS commitment to the control and management of feral animals and weeds within and around its reserves in the region.

5.3.1 Introduced Animals

Wild dogs (*Canis lupus*) exist on lands in and surrounding the reserves and extensive control programs have been undertaken in response to stock loss problems on neighbouring properties. The *Rural Lands Protection Act 1989* stipulates that pest animals must be controlled on Crown lands. Wild dogs, including dingoes, are declared pest animals under this Act. Cooperative dog control programs in the area have been successful in reducing the incidence of stock attacks. NPWS is a founding member of the Hume Wild Dog Working Group, whose key objective is to maintain a representative group of private and public land managers to coordinate wild dog management activities in the Woomargama – Carabost area, which includes the reserves.

Feral pigs (*Sus scrofa*) have existed, sometimes in high numbers, in Woomargama for a number of years. This has attracted illegal pig hunting both prior to and since gazettal of the park. Predation, habitat degradation, competition and transmission of disease from feral pigs has been identified as a key threatening process under the TSC Act and, as such, a threat abatement plan has been formulated. Cooperative pig control programs have been ongoing since gazettal with several hundred individuals being trapped. Again, the Service is committed to controlling pig populations in and around the reserves as a matter of priority and in line with the PAS actions for this species.

Foxes (*Vulpes vulpes*) exist within the reserves as they do throughout the landscape, and regular cooperative baiting programs are undertaken by NPWS, local landholders and the Hume Livestock Health and Pest Authority. Fox control on and adjacent to NPWS managed lands will continue to be undertaken on a cooperative basis. Predation by foxes on native animals has been identified as a key threatening process under the TSC Act and, as such, a threat abatement plan has been formulated. This plan proposes actions to reduce the impacts of fox predation on threatened species and to help conserve biodiversity more generally.

Feral goats (*Capris hircus*) occur within the reserves and have assisted in placing native vegetation under considerable pressure in the recent drought. Goat grazing has been identified in the recovery plan as a threat to the Phantom Wattle. In addition, goats are known to shelter in rock shelters and overhangs and consequently damage Aboriginal rock art. Control programs have been undertaken in the area since gazettal, and will continue on a periodic basis as necessary. Competition and habitat degradation by feral goats has been identified as a key threatening process under the TSC Act.

Other introduced species recorded in the reserves include the feral cat (*Felis catus*), rabbit (*Oryctolagus cuniculus*), house mouse (*Mus musculus*), black rat (*Rattus rattus*), European goldfinch (*Carduealis carduelis*), Eurasian blackbird (*Turdus merula*), common starling (*Sturnus vulgaris*) and domestic sheep and cattle. Apart from sheep and cattle, which occasionally stray into the reserves through unfenced boundaries, these species occur in varying numbers depending on seasonal variation and will be controlled as necessary using methods outlined in the Regional Pest Management Strategy.

Sand-plot monitoring is undertaken in Woomargama to measure the abundance of a broad range of medium to large terrestrial vertebrates, particularly dogs and foxes,

and in accordance with the Hume Wild Dog and Fox Control Plan. Abundance of these species and, to a lesser degree, goat and rabbit populations have been measured for the past three years, along with data relating to native animals. In the long term, data collected as part of this monitoring program can be used to assess the effectiveness of control programs in reducing pest species populations and the effects of this on native animal populations.

5.3.2 Introduced plants

St John's Wort *Hypericum perforatum*, Paterson's Curse *Echium plantagineum* and Blackberry *Rubis fruticosis* are the most prevalent invasive weeds in the reserves and on adjoining lands. Control programs have been undertaken since gazettal with weed mapping showing a marked decrease in these species, particularly where large infestations once occurred. Known Tree of Heaven (*Ailanthus altissima*) infestations have been eradicated from Woomargama since gazettal. A number of other weed species such as thistles and pasture grasses exist within the reserves. Control programs for introduced plants will continue in the reserves as per priorities listed in the regional pest management strategy.

As pine forests bordering the reserves mature and set seed, pine wildings may become a problem. Additionally, olive groves to the south of Woomargama will mature and set seed within the next 5 years. Their woody nature, ability to infest large areas and ease of seed transportation makes these species particularly hard to control. Monitoring of these species will continue to ensure that infestation potential is minimised before they become established.

Desired Outcomes

- The impact of introduced species on native plants and animals is minimised.

Strategies

- Control introduced species, and eradicate them where practicable, in accordance with the Regional Pest Management Strategy and best management practice, to ensure that the biodiversity of the reserves is not reduced due to their existence.

- Give priority for the control of those introduced species that:
  - are declared noxious or for which a national emergency control program has been declared or are known to be an important problem in other parks or states;
  - have a significant environmental impact, including damage to threatened species, catchment values and recreation values;
  - may affect neighbouring lands or are considered of high priority by the community;
  - where management is needed to maintain benefits gained from previous control programs or to allow another high priority management program to be effective;
  - where a window of opportunity occurs; or
  - are small, isolated occurrences.

- Avoid unnecessary environmental disturbances. Where disturbance is inevitable or is planned, consider the likely impact of the activity in terms of introduced species and put in place controls or programs to reduce any such impact.

- Seek the cooperation of neighbours in implementing weed and pest animal control programs. Undertake control in cooperation with the Hume Livestock Health and Pest Authority and Greater Hume Shire Council.

- Encourage maintenance and effective fencing of boundaries with grazing properties to prevent domestic stock from entering into the reserves. Provide fencing assistance where possible and appropriate.

- Continue annual sand-plot monitoring in the park, where in accordance with an adopted wild dog and fox control plan.

- Review the Regional Pest Management Strategy periodically to ensure species of highest concern are priority for control.

5.4 FIRE MANAGEMENT

Fire is a natural feature of the environment and is essential to the survival of some plant and animal communities. Inappropriate fire, however, can damage natural and cultural heritage and endanger visitors and neighbours. Management of bushfire in the reserves is a complex issue. Management must aim to achieve both long-term conservation of native plant and animal communities and ongoing protection of life and property within and adjacent to the reserves.

Ecological requirements

Bushfire regimes are a major determinant of the distribution and abundance of plants and animals. They also affect nutrient cycles, erosion patterns and hydrological regimes. Ecological research suggests the following requirements for biodiversity conservation:

- variability of fire intervals and area burnt is important to conserve floristic diversity and provide diversity of habitat for animals; fire at regular intervals will lead to loss of species;
- most plant species and communities require infrequent fires of moderate to high intensity to achieve regeneration but mosaic burns are generally better for fauna as they retain shelter and food refuges;
- fires during the breeding season are the most damaging to fauna communities because of direct killing of young and increased exposure;

Fire can also damage some types of Aboriginal sites and historic places. Features such as scarred trees, mining remnants, old buildings and farming implements can be permanently damaged or lost by wildfire. Other sites can be damaged by use of heavy machinery for fire suppression activities.

Fire history

The history of wild fire in Woomargama prior to 1985 is not well documented, although a major fire is known to have burnt throughout the area in 1952. In January 1985 lightning caused a fire that burnt a total of over 51,000 hectares, including most of the area that is now Woomargama National Park. In December 2002 lightning caused two fires in the park, one of which occurred near Tunnel Road and was contained to 1 hectare. The other was in steep, remote country in the park's north. Containment lines were constructed with a total of 1,162 hectares of both park and private property eventually being burnt, mostly from introduced fire.

A number of prescribed burns have been conducted since record keeping was commenced in 1967. The following table summarises the post-1967 prescribed burning history of Woomargama.

Date	Area burnt	Location
1967	12,222ha. Originally planned to be smaller but fire broke containment lines	Most of the eastern half of what is now park, including private property north and south of the park boundary.
April 1988	1,759ha	In the north-east of the park, wholly within the park boundary.
1991	1,817ha	On the western boundary of the park, mostly within the park boundary.
April 1992	3 burns of 2,542ha, 1,570ha and 6,792ha burnt a total of 10,904ha	On the east-west ridge tops running through the centre of the park, mostly within the park boundary.
May 1997	760ha	In the Ferndale area in the western section of the park, wholly within the park boundary.
April 2003	600ha	In the far eastern section of the park (West Jingellic), wholly within the park boundary.
May 2004	1371ha	In the far east of the park, south of Yenschs Road, within the park and on private property.
March 2005	1,200ha park, 250ha private property	Central western section of Woomargama (Home Flat) adjoining pine plantation and private farming land.

The fire history of Mullengandra is also not well documented, although the larger landscape scale fires that occurred in the early 1950s are thought to have affected the reserves.

Of interest is the number of lightning strikes causing fire that have been recorded within Woomargama. Forests NSW have supplied lightning strike data showing 31

strikes that caused fires in or near Woomargama over a 20 year period ending in 2003.

The frequency and inter-fire interval has determined the current structure and diversity of the reserve's forest ecosystems, and their resultant quality as native fauna habitat.

A Fire Management Strategy (including a Fire Operations Map) has been produced for the reserves. This strategy identifies the bushfire threat, requirements for the conservation of native plants and animals and community protection measures in areas where it is identified that fire is a threat to property. In addition, fire management guidelines are set out for threatened fauna species recorded or predicted to occur in the reserves.

A number of fuel monitoring sites have been established within Woomargama to give an overall picture of fuel accumulation over time and how this equates to bushfire risk.

Strategies and cooperative arrangements

Under the *Rural Fires Act 1997* the NPWS is a fire authority and is responsible for controlling fires on the reserve network and ensuring that they do not cause damage to other land or property. An important part of the NPWS's fire management regime is participation in local cooperative fire management arrangements, including implementation of Bush Fire Risk Management Plans developed by District Bush Fire Management Committees. The NPWS is a member of the Hume Zone Bush Fire Management Committee.

Management will aim to maintain biodiversity by restricting fires to only part of the distribution of a vegetation community at any one time and ensuring that identified fire thresholds are not exceeded.

A variety of fire management strategies have been developed including fuel reduction, fire trails maintenance, detection and cooperative arrangements. Some, or at times all, of these will be applied where appropriate to best protect life, property and natural and cultural assets. Close to boundary areas, fuel reduction programs and fire trail maintenance will be designed and implemented in cooperation with neighbours.

Desired Outcomes

- Fire regimes are appropriate for long-term maintenance of the reserve's plant and animal communities.
- Human-caused unplanned fires are prevented.
- The potential for spread of bushfires on, from, or into the reserves is minimised.
- Persons and property on or immediately adjacent to the reserves are protected from bushfires.
- Aboriginal sites, historic places and culturally significant features are protected from damage by bushfires.

Strategies

- Use prescribed fire to achieve a variety of fire regimes that maintain fire thresholds for each vegetation community in accordance with the Fire Management Strategy.

- Seek to avoid use of heavy machinery for fire suppression in areas of rare plants, Aboriginal sites and historic places.

- Rehabilitate areas disturbed by fire suppression operations as soon as practical after the fire.

- Encourage research into the ecological effects of fire in the reserves, particularly the fire response of significant plant species and the fire requirements of these communities.

- Continue to actively participate in the Hume Zone Bush Fire Management Committee. Maintain close contact and cooperation with fire control officers and volunteer bush fire brigades.

- Where appropriate, carry out fuel management in cooperation with neighbours for mutual protection.

- Close the reserves to public use during periods of extreme fire danger.

- Undertake fuel reduction programs, trail maintenance, research and monitoring programs in accordance with the policies outlined above and in the Fire Management Strategy.

5.5 CLIMATE CHANGE

Climate change has been listed as a key threatening process under the Threatened Species Conservation Act 1995.

Projections of future changes in climate for NSW include higher temperatures, increasing sea levels and water temperatures, elevated CO_2, more intense but possibly reduced annual average rainfall, increased temperature extremes and higher evaporative demand. These changes are likely to lead to greater intensity and frequency of fires, more severe droughts, reduced river runoff and water availability, regional flooding, increased erosion and ocean acidification.

The direct impacts of climate change on species and ecosystems may include:
- Range shifts and species movement towards cooler latitudes or higher elevations
- Extinctions of local populations along range boundaries
- Changes in productivity and nutrient cycling within ecosystems, due to a combination of climate change and increasing carbon dioxide levels
- Increasing invasion by opportunistic, weedy or highly mobile species, especially into sites where local populations of existing species are declining
- Increasing threat to freshwater ecosystems through decreasing water flows and changes in water temperature and chemistry, and

- Progressive decoupling of species interactions (for example plants and pollinators).

Adjusting our management of the environment through programs to reduce the pressures arising from other threats such as habitat fragmentation, invasive species and bushfires will help reduce the severity of the effects of climate change”.

6. VISITOR OPPORTUNITIES AND EDUCATION

6.1 INFORMATION PROVISION

Park facilities and services provide opportunities to enjoy, appreciate and understand the value of our natural and cultural heritage. Only areas that can sustain use are promoted in this way. Information provision at such places and about the area in general assists the protection of natural and cultural heritage, promotes support for conservation and increases the enjoyment and satisfaction of visitors.

Woomargama has a number of natural and cultural features of interest to visitors, primarily the relics of former mining activities at the Tin Mines camping area. These features will be interpreted to visitors in a manner that protects their special values and encourages appropriate use. Provision of facilities such as picnic areas, camping areas and walking tracks in those locations that can sustain such use is discussed in section 6.2 while this section discusses provision of information.

Provision of information about the reserves will involve three levels:

- promotion to increase community awareness of the existence of the reserves, their conservation importance and visitor opportunities;
- orientation and regulatory signage to enable visitors to find their way around the reserves, introduce them to its landscape and advise them about use restrictions; and,
- interpretation of individual components of the reserve's environment in order to increase visitor understanding of their values and of the environment in general, and provision of minimal impact use information.

Signage has been erected at key entry points and on trails within Woomargama. This signage displays trail names and provides some information about use restrictions in the park. This signage will be maintained. The Mullengandra reserves are not sign posted, have no public vehicular access, no facilities and visitation will not be promoted to the public.

Desired Outcomes

- There is widespread community understanding and appreciation of the reserve's natural and cultural values.
- Visitors are aware of Woomargama's recreation opportunities and can easily find their way to and from facilities.
- The reserves are a useful educational resource for local schools and community organisations.

Strategies

- Produce media releases and attend meetings with neighbours and community organisations to promote community understanding of reserve values and management strategies.

- Emphasise the following themes in promotion and interpretation programs:
  - Aboriginal and non-Aboriginal heritage;
  - diversity of plants and animals;
  - open spaces.

- Provide additional directional signposting within Woomargama as facilities are provided.

- Place orientation/interpretive/regulatory signs at key visitor destinations and entry points.

- Involve the local Aboriginal community in development of material and programs for interpretation of Aboriginal culture.

- Support and assist educational use of the reserves by schools, community groups and individuals through provision of information and programs such as walks and talks.

6.2 RECREATION OPPORTUNITIES

Visitor opportunities provided in national parks are generally those at the low-key end of the spectrum, in natural and undeveloped settings. Recreational uses which are ecologically sustainable and which directly contribute to the visitor's understanding and appreciation of the reserves are considered appropriate.

Management of visitor use to be ecologically sustainable requires placing limits on the number of access points, design of facilities to ensure that numbers of visitors and the style of use is appropriate for the site, and promotion of minimal impact use. The provisions below are designed to maintain the low key, scenic, natural settings which are the special feature of the reserves and to provide for future use in a manner which protects ecological integrity and cultural heritage values.

Given its location away from large regional population centres, Woomargama has not traditionally received high visitor use, though the type of use it has received is varied. Provision for visitor use of Woomargama has been considered in a regional context and has taken into account alternatives for activities to be undertaken in other areas both within NSW and across the border in Victoria.

Recreational opportunities in Mullengandra are very limited. Use of the reserve by the public is limited due to private property access constraints, the small size of the reserve and lack of facilities. Access to Mullengandra will be by pre-arranged appointment with NPWS.

Vehicle Touring

Vehicle-based sight seeing is one of the most popular recreational activities in Woomargama. The majority of the roads in the park are open to the public and are of a four wheel drive, dry weather standard. Woomargama is within easy day trip distance of Albury, Holbrook and a number of population centres in NSW and Victoria, however, vehicle based touring is not thought to bring large numbers of people into the area. Traffic counters have been installed at the two key access

points to monitor traffic volumes within the park. On average, approximately 350 vehicle movements (equating to approximately 1000 visitors) per year are recorded in Woomargama. No visitors are thought to use Mullengandra regularly.

Although riding of registered trail bikes on park roads is permitted, off-road trail bike riding causes damage to vegetation and erosion, creates tracks that are used by other people and feral animals, and clashes with other visitors undertaking more passive activities, and will not be permitted. These impacts will be managed by educating visitors about off-road impacts, undertaking periodic law enforcement, and installing regulatory and interpretative signage at key locations.

Bush Walking

The Hume & Hovell Walking Track (HHWT) attracts a number of visitors to Woomargama. This track, which traces the 1824 Hume and Hovell expedition from Cooma Cottage in Yass, to Albury, is managed and maintained by the NSW Department of Lands. Liaison with this department regarding the management and promotion of the section of the HHWT within the park has continued since gazettal in 2001.

Bush walking off the HHWT is permitted. A number of high peaks within short walking distance from roads provide scenic views to the north and west of the park. Waterfalls and striking cliff faces are also potential destinations for walkers. Navigational skills and care are required to access these locations as no formal walking tracks have been constructed, apart from the HHWT.

Camping

Two designated camping areas associated with the HHWT are located within Woomargama.

The Tin Mines area is a large open expanse of level, grassy ground and is the most popular location in the park for camping and picnicking. It is accessible by 4WD vehicle as well as being on the HHWT. Two toilets, a timber shelter, a number of fireplaces/barbecues and picnic tables are provided and these appear to adequately service the current low numbers of visitors. Impacts at this site from visitors include rubbish dumping, vehicle access off formed roads and firewood collection, although these impacts are not commonly observed.

The Samual Bollard Camping Area is located in the south-west of Woomargama. This is the second designated vehicle accessible HHWT camping area in the park. A shelter, water tank, picnic table and a pit toilet are provided at this site although it appears to receive little visitation.

Pack camping also occurs in Woomargama at very low levels in other areas away from roads and the HHWT.

Camping has not traditionally occurred in the Mullengandra reserves.

Interpretation of Historic Sites

The intactness and rarity of historic sites in and around Woomargama lends itself well to provision of interpretive walks. At present no interpretation of the history of mining or similar historic sites occurs within the park. An opportunity exists, given the relative significance of the former mining sites, to provide interpretive facilities, such as signs and walking tracks, at sites or features relating to past mining activities.

Other Recreational Activities

Horse riding has occurred on a very limited basis in Woomargama in the past.

Cycling has become very popular over the last decade and has been undertaken as a recreational activity in Woomargama.

Community and university groups also visit the area for nature appreciation and scientific/educational activities.

Commercial Activities

Commercial 4WD 'tag-along' tours have occurred occasionally in Woomargama in the past. All commercial operations in parks must be licensed and will be monitored. The licensing of these activities will be reviewed periodically to ensure that the natural and cultural values of the park are not compromised and controls such as limits on numbers or locations may be implemented if necessary.

Desired Outcomes

- A variety of visitor opportunities are available that encourage appreciation of the natural environment and cultural features of the park.
- Facilities are designed and managed to provide a satisfying visitor experience and minimise impacts.
- Visitor use is compatible with the purposes of national parks and is ecologically sustainable.

Strategies

- Permit vehicle touring and trail bike riding on park roads (see map, centre pages). During conditions of extreme fire danger or high soil moisture content from significant rainfall, and during fire operations, park roads may be temporarily closed to public use.

- Continue to promote camping at the Tin Mines camping area and the Samual Bollard camping area. Limit the provision of toilets, fire pits and barbecues to these sites.

- Encourage visitors to use fuel stoves or bring their own firewood, to remove their own rubbish and to use other minimal impact recreation practices, through information signs and other means.

- Monitor impacts of pack camping in the park and place restrictions on this activity if needed to minimise impacts.

- Permit cycling on roads in Woomargama. No cycling will be permitted on designated walking tracks or off formed roads. Cycling will not be permitted in Mullengandra.

- Permit horse riding on roads in Woomargama. Camping with horses will not be permitted and no horse riding will be permitted on designated walking tracks or off park roads. No horses will be permitted in Mullengandra.

- Encourage continued use of Woomargama for educational and scientific visits, and allow use, by permit, of Mullengandra for educational and scientific purposes.

- Permit commercial tours and activities in Woomargama subject to the following:
  - limits on group sizes, frequency of use and locations used if necessary to minimise environmental impacts and conflicts with other park users;
  - prior permission for groups of more than 12 vehicles; and
  - a licence for commercial use.

- Continue to periodically collect traffic movement information. Make spot checks to record numbers of visitors using picnic and camping areas. Monitor the condition of popular visitor areas.

- Undertake periodic surveys of recreational users to determine patterns of use and visitor satisfaction levels.

- Investigate the need for provision of facilities such as interpretive walking tracks and signage relating to historic sites in Woomargama and construct where feasible (refer to section 4.5).

- Liaise with Department of Lands regarding management of the Hume and Hovell Walking Track within the park, particularly regarding visitor safety, track maintenance and promotion and interpretation.

7. RESEARCH AND MONITORING

The purpose of scientific study in the reserves is to improve understanding of their natural and cultural heritage and the processes which affect them. Research also establishes the requirements for management of particular species.

Under the Southern Regional Forest Agreement (RFA) all forest managers including Forests NSW, Dept of Natural Resources and the NPWS must demonstrate Ecologically Sustainable Forest Management (ESFM). ESFM aims to maintain or increase the full suite of forest values for present and future generations across the NSW native forest estate, including:

- ecosystem biodiversity, health, vitality, productive capacity and functional processes;
- soil and water productive capacity and functional processes;
- long-term social and economic benefit; and
- natural and cultural heritage values.

ESFM is an over-riding management principle and will be applied to all ecosystem types, not just forests. It will be implemented primarily through monitoring to provide feedback on management programs and directions for future adaptive management. Performance indicators for ecologically sustainable forest management have been identified. Monitoring programs will be developed using the indicators to demonstrate the impact of management actions on ecological functions. Remedial management actions will then be undertaken as required.

Research priorities identified under the RFA will be pursued along with topics identified in this plan of management. Key areas of research and monitoring will be:

- threatened species management;
- feral animal control and management;
- fire management;
- visitor monitoring.

Additional research programs will be considered where they complement ESFM criteria and indicators. The results of research and monitoring will be used to guide management programs.

Research by other organisations and students may provide valuable information for management and will be encouraged.

Sand-plot monitoring is undertaken annually in the park to measure the abundance of a broad range of medium to large terrestrial vertebrates (See section 5.3.1). This will continue where in accordance with an adopted wild dog and fox control plan.

Desired Outcomes

- Research is undertaken that enhances the information base and assists management of the reserves.
- Research causes minimal environmental damage.
- Monitoring programs are in place to detect any changes in the status of resources.

Strategies

- Use the principles of ESFM to guide management operations. Work with other authorities and stakeholders in implementing ESFM principles across the landscape.

- Undertake research to provide information about the reserve's natural and cultural heritage and human use in order to facilitate management.

- Permit appropriate research by other organisations and individuals and promote research that is directly useful for management purposes.

- Require any research structures and long term markers to be placed in locations that will minimise their visual impact and require their removal upon completion of the research.

8. MANAGEMENT FACILITIES AND OPERATIONS

A gravel quarry exists within Woomargama on the Tunnel Road/Tin Mines Road intersection. This quarry is no longer used by NPWS and will be closed and rehabilitated.

A network of public access roads and management trails exists within the reserves (see map). This will be retained to provide access for management activities including weed and feral animal control, fire suppression and law enforcement activities. Public access roads will be maintained to provide for recreational use (see Section 6). Access to the park may need to be restricted during periods of extreme fire danger or when soil moisture content is high due to significant rainfall.

A new trail has been proposed as part of an approved roads plan for the park. The proposed route of the trail crosses both national park and state forest lands between Tower Trail and Millers Road. Appropriate consultation with Forests NSW and environmental impact assessment will need to be undertaken prior to any works commencing.

A radio repeater is located on top of Mt Jingellic in Woomargama. This repeater is a shared NPWS/ RFS/ NSW Police facility. Access to this site is through state forest under agreement with Forests NSW.

Several roads through Woomargama 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 Climate Change and the Environment and must ultimately be added to or excluded from the park. They include parts of Yenschs Road, Galvins Road, Millers Road, Tin Mines Road, Mathewsons Trail, Hanels Trail and Ferndale Road. The NPE Act states that the Minister cannot close any roads that provided 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 the users.

A private in-holding of approximately 260 hectares exists in the north of Woomargama. There is no current agreement for access to this property, however, under the NPE Act NPWS is obliged to replace the easement for right of way that existed prior to gazettal of the national park. This block is a high priority for purchase in the event that it becomes available for sale. Priority will also be given to purchase of additional lands sharing a boundary with the park, where these lands complement existing park values.

Boundary fences are in varying states of repair on reserve boundaries. Much of the reserves remain unfenced due mainly to topographical constraints. The Service will continue to provide funding assistance for fencing of areas of concern, such as where domestic stock are entering the reserves. This assistance will be based on regional priorities and cannot be guaranteed from year to year. In some cases fencing has been constructed away from reserve boundaries on a give-and-take basis. Locations of new fences will be as close to actual boundaries as possible.

In 2005 the Department of Lands commenced working towards rationalising the number of enclosure permits held over crown land, in accordance with the *Crown Lands Legislation Amendment (Budget) Act 2004.* Many of these enclosure permit lands provide legal access to NPWS estate. The position of NPWS is that any such legal access should not to be given up unless:

- there is other legal access to that NPWS estate;
- the legal access provided for by the enclosure permit land in question is over terrain where it would be impractical to ever construct a road or to offer public foot access;
- there is other secure practical access (ie. a road constructed within a Crown road reserve or a formal easement for right-of-way over a constructed private road);
- the park or reserve will not expand into an area affected by the legal access proposed for closure;
- the road reserve corridor is not required to provide for public access on foot; and
- there are no significant natural resource or habitat areas within the enclosure permit area that are unprotected by an appropriately worded covenant.

Desired Outcomes

- Management facilities adequately serve the needs of park management and have acceptable environmental impact.
- A good relationship is maintained with neighbours of the reserves.

Strategies

- Maintain all park roads to a good standard of stability and access.
- Restrict public access to the park during periods of extreme fire danger or when soil moisture content is high due to significant rainfall
- Maintain close liaison with neighbours of the reserves to deal with matters of mutual concern.
- Liaise with Greater Hume Shire Council regarding the closure and rehabilitation of the former quarry site at the Tin Mines/Tunnel Road intersection. Close and rehabilitate the quarry.
- Liaise with Forests NSW regarding the proposed construction of a new trail between Tower Trail and Millers Road.
- Liaise with Forests NSW, Rural Fire Service and NSW Police regarding continued access and maintenance cost-sharing of Tower trail leading to the Mt. Jingellic radio repeater.
- Undertake relevant environmental impact assessment and liaison with stakeholders prior to construction and extension of park roads as listed in the roads plan.
- Enter into access licences and maintenance arrangements for use of trails for access to private property where appropriate.

- Review the adequacy of boundary fencing and provide assistance, where possible, based on regional priorities and funding.

- Following construction of the new road, review the status of other roads in the immediate vicinity and if they are not necessary they will be gated and/or rehabilitated.

9. PLAN IMPLEMENTATION

This plan of management establishes a scheme of operations for Woomargama National Park and State Conservation Area and Mullengandra Nature Reserve and State Conservation Area. The plan is part of a system of management developed by the NPWS. The system includes the NPW Act, management policies, established conservation and recreation philosophies, and strategic planning at corporate, branch and regional levels. The latter may include development of related plans such as regional recreation plans, species recovery plans, fire management plans and conservation plans.

Section 81 of the Act requires that this plan of management shall be carried out and given effect to, and that no operations shall be undertaken in relation to Woomargama National Park and State Conservation Area and Mullengandra Nature Reserve and State Conservation Area unless they are in accordance with the plan.

Implementation of this plan will be undertaken within the annual programs of the Service's South West Slopes Region. Relative priorities for identified activities are set out in the table below. These priorities are determined in the context of branch and regional strategic planning, and are subject to the availability of necessary staff and funds and to any special requirements of the Director-General or the Minister. The implementation of the plan will be monitored and its success in achieving the identified objectives will be assessed.

The environmental impact of proposed activities will be assessed at all stages in accordance with environmental assessment procedures. Where impacts are found to be unacceptable, activities will be modified in accordance with the plan policies.

This plan of management does not have a specific term and will stay in force until amended or replaced in accordance with section 73B of the Act. The plan applies both to the land currently reserved and to any future additions to the reserves. Where management strategies or works are proposed for additions or the existing area that are not consistent with the plan, an amendment to the plan will be required.

Strategies

- Undertake an annual review of progress in implementing this plan of management.

- Undertake an assessment after 5 years of the effectiveness of managing the reserves in accordance with this plan and of the degree of success in achieving the plan’s objectives and desired outcomes. Base the evaluation on the monitoring programs set out in this plan and any others that may be developed.

IMPLEMENTATION TABLE

Priority	Strategy	Plan reference
	Geology and Landform	
High	Maintain the open and grassy character of the Tin Mines. This will require periodic weed spraying to control pasture species and weeds in the area.	**4.1**
Medium	Ensure works and facilities planned for the reserves do not compromise aesthetic and scenic values.	**4.1**
	Native Plants	
High	Identify and protect the habitats of threatened species, particularly Phantom Wattle, and any other threatened vegetation species in accordance with actions listed in recovery plans and the Priorities Action Statement.	**4.2**
Medium	Enhance the value of the reserves by promoting the value of conservation of remnant vegetation through liaison with neighbours, the community, and local council and appropriate government agencies.	**4.2**
High	Identify and monitor potential local threats to the grassy box/gum woodland in the central west of Woomargama and implement measures to reduce the likelihood and significance of these impacts on the community.	**4.2**
	Native Animals	
High	Protect the habitats of threatened fauna species and implement actions in recovery plans, where they exist, and in the Priorities Action Statement for other threatened species and communities.	**4.3**
Medium	Continue to record the distribution of threatened and significant fauna species through targeted surveys and population monitoring.	**4.3**

Priority	Strategy	Plan reference
	Aboriginal Heritage	
High	The art site will be conserved in accordance with recommendations outlined in the conservation management plan and the site monitoring report. This includes periodic photo monitoring of the art site, protection from fire by reducing fuels in the immediate vicinity of the overhang and not promoting its location to the public.	**4.4**
Medium	Undertake further surveys for significant sites, including art sites and rock shelters, and liaise with relevant local Aboriginal communities to determine the cultural values of the reserves.	**4.4**
Medium	Manage Aboriginal heritage in consultation with the Albury and District Local Aboriginal Land Council and other relevant Aboriginal community organisations.	**4.4**
High	Ensure that visitors and facilities do not impact on any Aboriginal sites and places.	**4.4**
High	Undertake a cultural assessment prior to all activities with the potential to impact on Aboriginal sites and places.	**4.4**
Medium	Do not publicise the location of Aboriginal sites and places except where the agreement of relevant Aboriginal community organisations has been obtained.	**4.4**
	Historic Heritage	
Medium	Record and manage all historic places in a way that is appropriate to their cultural significance in accordance with the Burra Charter of Australia ICOMOS.	**4.5**
Low	Rex Beaver's Hut will be managed in accordance with the Burra Charter.	**4.5**
Low	Rabbiter's Hut will be assessed and conserved if found to be significant.	**4.5**
Medium	Selected sections of the Basin Creek tin mining field at "The Tin Mines" picnic area will be conserved and interpreted as per recommendations made by Pearson (2002). Visitors will be provided with information about the past mining use of the area and the history of the sluice hole.	**4.5**
Medium	Liaison will be undertaken with Forests NSW regarding the on-going management of the historic structures associated with the former Jingellic Tin Mine.	**4.5**

Priority	Strategy	Plan reference
	Soil erosion	
Medium	Manage former mining areas to minimise off site impacts and reduce progress of gullies where they are actively extending and leading to unacceptable off-site impacts.	**5.1**
High	Design and undertake all road and facilities maintenance and construction works in a manner that minimises soil erosion.	**5.1**
	Water Quality and Catchment Management	
Medium	Design and undertake all works in a manner that minimises water pollution.	**5.2**
Low	Liaise with local government and other authorities as needed to maintain the water quality of the reserve's catchments.	**5.2**
Medium	Continue to implement recommendations made by, and participate as a member of, the Murray Catchment Management Authority.	**5.2**
	Introduced Species	
High	Control introduced species, and eradicate them where practicable, in accordance with the regional pest management strategy and best management practice, to ensure that the biodiversity of the reserves is not reduced due to their existence.	**5.3**
High	Give priority for the control of introduced species to those that: – are declared noxious or for which a national emergency control program has been declared or are known to be an important problem in other parks or states; – have a significant environmental impact, including damage to threatened species, catchment values and recreation values; – may affect neighbouring lands or are considered of high priority by the community; – where management is needed to maintain benefits gained from previous control programs or to allow another high priority management program to be effective; – where a window of opportunity occurs; or – are small, isolated occurrences.	**5.3**

Priority	Strategy	Plan reference
Medium	Avoid unnecessary environmental disturbances. Where disturbance is inevitable or is planned, consider the likely impact of the activity in terms of introduced species and put in place controls or programs to reduce any such impact.	**5.3**
High	Seek the cooperation of neighbours in implementing weed and pest animal control programs. Undertake control in cooperation with the Hume Livestock Health and Pest Authority and Greater Hume Shire Council.	**5.3**
Medium	Encourage maintenance and effective fencing of boundaries with grazing properties to prevent domestic stock from entering into the reserves. Provide fencing assistance where possible and appropriate.	**5.3**
High	Continue annual sand-plot monitoring in the park, where in accordance with an adopted wild dog and fox control plan.	**5.3**
Medium	Review the Regional Pest Management Strategy periodically to ensure species of highest concern are priority for control.	**5.3**
	Fire Management	
Medium	Use prescribed fire to achieve a variety of fire regimes that maintain fire thresholds for each vegetation community in accordance with the Fire Management Strategy.	**5.4**
High	Seek to avoid use of heavy machinery for fire suppression in areas of rare plants, Aboriginal sites and historic places.	**5.4**
High	Rehabilitate areas disturbed by fire suppression operations as soon as practical after the fire.	**5.4**
Medium	Encourage research into the ecological effects of fire in the reserves, particularly the fire response of significant plant species and the fire requirements of these communities.	**5.4**
Medium	Continue to actively participate in the Hume Zone Bush Fire Management Committee. Maintain close contact and cooperation with fire control officers and volunteer bush fire brigades.	**5.4**
Medium	Where appropriate, carry out fuel management in cooperation with neighbours for mutual protection.	**5.4**
Medium	Close the reserves to public use during periods of extreme fire danger.	**5.4**
High	Undertake fuel reduction programs, trail maintenance, research and monitoring programs in accordance with the policies outlined above and the Fire Management Strategy.	**5.4**

Priority	Strategy	Plan reference
	Information Provision	
Low	Produce media releases and attend meetings with neighbours and community organisations to promote community understanding of reserve values and management strategies.	**6.1**
Low	Emphasise the following themes in promotion and interpretation programs: - Aboriginal and non-Aboriginal heritage; - diversity of plants and animals; - open spaces.	**6.1**
Medium	Provide additional directional signposting within Woomargama as facilities are provided.	**6.1**
High	Place orientation/interpretive/regulatory signs at key visitor destinations and entry points.	**6.1**
Medium	Involve the local Aboriginal community in development of material and programs for interpretation of Aboriginal culture.	**6.1**
Low	Support and assist educational use of the reserves by schools, community groups and individuals through provision of information and programs such as walks and talks.	**6.1**
	Recreation Opportunities	
Medium	Permit vehicle touring and trail bike riding on park roads (see map, centre pages). During conditions of extreme fire danger or high soil moisture content from significant rainfall, and during fire operations, park roads may be temporarily closed to public use.	**6.2**
Low	Continue to promote camping at the Tin Mines camping area, and the Samual Bollard camping area. Limit the provision of toilets, fire pits and barbecues to these sites.	**6.2**
Medium	Encourage visitors to use fuel stoves or bring their own firewood, to remove their own rubbish and to use other minimal impact recreation practices through information signs and other means.	**6.2**

Priority	Strategy	Plan reference
Low	Monitor impacts of pack camping in the park and place restrictions on this activity if needed to minimise impacts.	**6.2**
Low	Permit cycling on roads in Woomargama. No cycling will be permitted on designated walking tracks or off formed roads. Cycling will not be permitted in Mullengandra.	**6.2**
Low	Permit horse riding on roads in Woomargama. Camping with horses will not be permitted and no horse riding will be permitted on designated walking tracks or off park roads. No horses will be permitted in Mullengandra.	**6.2**
Low	Encourage continued use of Woomargama for educational and scientific visits, and allow use by permit of Mullengandra for educational and scientific purposes.	**6.2**
Low	Permit commercial tours and activities in Woomargama subject to the following: - limits on group sizes, frequency of use and locations used if necessary to minimise environmental impacts and conflicts with other park users; - prior permission for groups of more than 12 vehicles; and - a licence for commercial use.	**6.2**
High	Continue to periodically collect traffic movement information. Make spot checks to record numbers of visitors using picnic and camping areas. Monitor the condition of popular visitor areas.	**6.2**
Medium	Undertake periodic surveys of recreational users to determine patterns of use and visitor satisfaction levels.	**6.2**
Low	Investigate the need for provision of facilities such as interpretive walking tracks and signage relating to historic sites in Woomargama and construct where feasible (refer to section 4.5).	**6.2**
Medium	Liaise with Department of Lands regarding management of the Hume and Hovell Walking Track within the park, particularly regarding visitor safety, track maintenance and promotion and interpretation.	**6.2**
	Research and Monitoring	
Medium	Use the principles of Ecologically Sustainable Forest Management to guide management operations. Work with other authorities and stakeholders in implementing ESFM principles across the landscape.	**7**

Priority	Strategy	Plan reference
Medium	Undertake research to provide information about the reserve's natural and cultural heritage and human use in order to facilitate management.	**7**
Medium	Permit appropriate research by other organisations and individuals and promote research that is directly useful for management purposes.	**7**
Medium	Require any research structures and long term markers to be placed in locations that will minimise their visual impact and require their removal upon completion of the research.	**7**
	NPWS Management Facilities and Operations	
High	Maintain all park roads to a good standard of stability and access.	**8**
Medium	Restrict public access to the park during periods of extreme fire danger or when soil moisture content is high due to significant rainfall	**8**
Medium	Maintain close liaison with neighbours of the reserves to deal with matters of mutual concern.	**8**
Medium	Liaise with Greater Hume Shire Council regarding the closure and rehabilitation of the former quarry site at the Tin Mines/Tunnel Road intersection. Close and rehabilitate the quarry.	**8**
Medium	Liaise with Forests NSW regarding the proposed construction of a new trail between Tower Trail and Millers Road.	**8**
Medium	Liaise with Forests NSW, Rural Fire Service and NSW Police regarding continued access and maintenance cost-sharing of Tower trail leading to the Mt. Jingellic radio repeater.	**8**
High	Undertake relevant environmental impact assessments and liaison with stakeholders prior to construction and extension of park roads as listed in the roads plan.	**8**
High	Enter into access licences and maintenance arrangements for use of trails for access to private property where appropriate.	**8**
High	Review the adequacy of boundary fencing and provide assistance, where possible, based on regional priorities and funding	**8**
Medium	Following construction of the new road, the status of other roads in the immediate vicinity will be reviewed and if they are not necessary they will be gated and/or rehabilitated.	**8**

Priority	Strategy	Plan reference
	Plan Implementation	
High	Undertaken an annual review of progress in implementing this plan of management.	**9**
Medium	Undertake an assessment after 5 years of the effectiveness of managing the reserves in accordance with this plan and of the degree of success in achieving the plan's objectives and desired outcomes. Base the evaluation on the monitoring programs set out in this plan and any others that may be developed.	**9**

Legend

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.

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APPENDIX 1

Bird species list for Woomargama and Mullengandra Reserves.

Scientific Name	Common Name	Status
Dromaius novaehollandiae	Emu	P
Coturnix pectoralis	Stubble Quail	P
Coturnix ypsilophora	Brown Quail	P
Anas castanea	Chestnut Teal	P
Anas gracilis	Grey Teal	P
Anas platyrhynchos	Mallard	U
Anas rhynchotis	Australasian Shoveler	P
Anas superciliosa	Pacific Black Duck	P
Aythya australis	Hardhead	P
Biziura lobata	Musk Duck	P
Chenonetta jubata	Australian Wood Duck	P
Cygnus atratus	Black Swan	P
Dendrocygna eytoni	Plumed Whistling-Duck	P
Malacorhynchus membranaceus	Pink-eared Duck	P
Stictonetta naevosa	Freckled Duck	V
Tadorna tadornoides	Australian Shelduck	P
Podiceps cristatus	Great Crested Grebe	P
Poliocephalus poliocephalus	Hoary-headed Grebe	P
Tachybaptus novaehollandiae	Australasian Grebe	P
Anhinga melanogaster	Darter	P
Phalacrocorax carbo	Great Cormorant	P
Phalacrocorax melanoleucos	Little Pied Cormorant	P
Phalacrocorax sulcirostris	Little Black Cormorant	P
Phalacrocorax varius	Pied Cormorant	P
Pelecanus conspicillatus	Australian Pelican	P
Ardea alba	Great Egret	P
Ardea ibis	Cattle Egret	P
Ardea intermedia	Intermediate Egret	P
Ardea pacifica	White-necked Heron	P
Egretta garzetta	Little Egret	P
Egretta novaehollandiae	White-faced Heron	P
Nycticorax caledonicus	Nankeen Night Heron	P

Scientific Name	Common Name	Status
Platalea flavipes	Yellow-billed Spoonbill	P
Platalea regia	Royal Spoonbill	P
Threskiornis molucca	Australian White Ibis	P
Threskiornis spinicollis	Straw-necked Ibis	P
Accipiter cirrocephalus	Collared Sparrowhawk	P
Accipiter fasciatus	Brown Goshawk	P
Accipiter novaehollandiae	Grey Goshawk	P
Aquila audax	Wedge-tailed Eagle	P
Circus approximans	Swamp Harrier	P
Circus assimilis	Spotted Harrier	P
Elanus axillaris	Black-shouldered Kite	P
Haliaeetus leucogaster	White-bellied Sea-Eagle	P
Haliastur sphenurus	Whistling Kite	P
Hieraaetus morphnoides	Little Eagle	P
Falco berigora	Brown Falcon	P
Falco cenchroides	Nankeen Kestrel	P
Falco longipennis	Australian Hobby	P
Falco peregrinus	Peregrine Falcon	P
Falco subniger	Black Falcon	P
Fulica atra	Eurasian Coot	P
Gallinula tenebrosa	Dusky Moorhen	P
Gallinula ventralis	Black-tailed Native-hen	P
Gallirallus philippensis	Buff-banded Rail	P
Porphyrio porphyrio	Purple Swamphen	P
Porzana fluminea	Australian Spotted Crake	P
Turnix varia	Painted Button-quail	P
Calidris acuminata	Sharp-tailed Sandpiper	P
Gallinago hardwickii	Latham's Snipe	P
Tringa nebularia	Common Greenshank	P
Rostratula benghalensis australis	Painted Snipe (Australian subspecies)	E
Burhinus grallarius	Bush Stone-curlew	E
Charadrius ruficapillus	Red-capped Plover	P
Elseyornis melanops	Black-fronted Dotterel	P
Erythrogonys cinctus	Red-kneed Dotterel	P

Scientific Name	Common Name	Status
Vanellus miles	Masked Lapwing	P
Vanellus tricolor	Banded Lapwing	P
Chlidonias hybridus	Whiskered Tern	P
Larus novaehollandiae	Silver Gull	P
Columba livia	Rock Dove	U
Geopelia placida	Peaceful Dove	P
Ocyphaps lophotes	Crested Pigeon	P
Phaps chalcoptera	Common Bronzewing	P
Cacatua galerita	Sulphur-crested Cockatoo	P
Callocephalon fimbriatum	Gang-gang Cockatoo	P
Calyptorhynchus funereus	Yellow-tailed Black-Cockatoo	P
Eolophus roseicapillus	Galah	P
Nymphicus hollandicus	Cockatiel	P
Alisterus scapularis	Australian King-Parrot	P
Glossopsitta pusilla	Little Lorikeet	P
Melopsittacus undulatus	Budgerigar	P
Neophema pulchella	Turquoise Parrot	V
Platycercus adscitus eximius	Eastern Rosella	P
Platycercus elegans	Crimson Rosella	P
Platycercus elegans flaveolus	Yellow Rosella	P
Polytelis swainsonii	Superb Parrot	V
Psephotus haematonotus	Red-rumped Parrot	P
Cacomantis flabelliformis	Fan-tailed Cuckoo	P
Cacomantis variolosus	Brush Cuckoo	P
Chalcites basalis	Horsfield's Bronze-Cuckoo	P
Chalcites lucidus	Shining Bronze-Cuckoo	P
Cuculus pallidus	Pallid Cuckoo	P
Ninox boobook	Southern Boobook	P
Ninox connivens	Barking Owl	V
Ninox strenua	Powerful Owl	V
Tyto alba	Barn Owl	P
Podargus strigoides	Tawny Frogmouth	P
Aegotheles cristatus	Australian Owlet-nightjar	P
Hirundapus caudacutus	White-throated Needletail	P
Dacelo novaeguineae	Laughing Kookaburra	P

Scientific Name	Common Name	Status
Todiramphus sanctus	Sacred Kingfisher	P
Merops ornatus	Rainbow Bee-eater	P
Eurystomus orientalis	Dollarbird	P
Climacteris erythrops	Red-browed Treecreeper	P
Climacteris picumnus	Brown Treecreeper	V
Cormobates leucophaeus	White-throated Treecreeper	P
Malurus cyaneus	Superb Fairy-wren	P
Pardalotus punctatus	Spotted Pardalote	P
Pardalotus striatus	Striated Pardalote	P
Acanthiza apicalis	Inland Thornbill	P
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	P
Acanthiza lineata	Striated Thornbill	P
Acanthiza nana	Yellow Thornbill	P
Acanthiza pusilla	Brown Thornbill	P
Acanthiza reguloides	Buff-rumped Thornbill	P
Acanthiza uropygialis	Chestnut-rumped Thornbill	P
Aphelocephala leucopsis	Southern Whiteface	P
Gerygone fusca	Western Gerygone	P
Gerygone olivacea	White-throated Gerygone	P
Pyrrholaemus sagittatus	Speckled Warbler	V
Sericornis frontalis	White-browed Scrubwren	P
Smicrornis brevirostris	Weebill	P
Acanthagenys rufogularis	Spiny-cheeked Honeyeater	P
Acanthorhynchus tenuirostris	Eastern Spinebill	P
Anthochaera carunculata	Red Wattlebird	P
Entomyzon cyanotis	Blue-faced Honeyeater	P
Epthianura albifrons	White-fronted Chat	P
Grantiella picta	Painted Honeyeater	V
Lichenostomus chrysops	Yellow-faced Honeyeater	P
Lichenostomus fuscus	Fuscous Honeyeater	P
Lichenostomus leucotis	White-eared Honeyeater	P
Lichenostomus melanops	Yellow-tufted Honeyeater	P
Lichenostomus penicillatus	White-plumed Honeyeater	P
Lichenostomus plumulus	Grey-fronted Honeyeater	P
Lichenostomus virescens	Singing Honeyeater	P

Scientific Name	Common Name	Status
Manorina melanocephala	Noisy Miner	P
Melithreptus brevirostris	Brown-headed Honeyeater	P
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subsp.)	V
Melithreptus lunatus	White-naped Honeyeater	P
Philemon citreogularis	Little Friarbird	P
Philemon corniculatus	Noisy Friarbird	P
Plectorhyncha lanceolata	Striped Honeyeater	P
Xanthomyza phrygia	Regent Honeyeater	E
Eopsaltria australis	Eastern Yellow Robin	P
Melanodryas cucullata	Hooded Robin	V
Microeca fascinans	Jacky Winter	P
Petroica boodang	Scarlet Robin	P
Petroica goodenovii	Red-capped Robin	P
Petroica phoenicea	Flame Robin	P
Petroica rodinogaster	Pink Robin	V
Petroica rosea	Rose Robin	P
Pomatostomus superciliosus	White-browed Babbler	P
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subsp.)	V
Cinclosoma punctatum	Spotted Quail-thrush	P
Daphoenositta chrysoptera	Varied Sittella	P
Colluricincla harmonica	Grey Shrike-thrush	P
Falcunculus frontatus	Eastern Shrike-tit	P
Pachycephala pectoralis	Golden Whistler	P
Pachycephala rufiventris	Rufous Whistler	P
Grallina cyanoleuca	Magpie-lark	P
Myiagra cyanoleuca	Satin Flycatcher	P
Myiagra inquieta	Restless Flycatcher	P
Myiagra rubecula	Leaden Flycatcher	P
Rhipidura albiscapa	Grey Fantail	P
Rhipidura leucophrys	Willie Wagtail	P
Rhipidura rufifrons	Rufous Fantail	P
Coracina novaehollandiae	Black-faced Cuckoo-shrike	P
Lalage tricolor	White-winged Triller	P

Scientific Name	Common Name	Status
Oriolus sagittatus	Olive-backed Oriole	P
Artamus cinereus	Black-faced Woodswallow	P
Artamus cyanopterus	Dusky Woodswallow	P
Artamus personatus	Masked Woodswallow	P
Artamus superciliosus	White-browed Woodswallow	P
Cracticus nigrogularis	Pied Butcherbird	P
Cracticus torquatus	Grey Butcherbird	P
Gymnorhina tibicen	Australian Magpie	P
Strepera graculina	Pied Currawong	P
Strepera versicolor	Grey Currawong	P
Corvus coronoides	Australian Raven	P
Corvus mellori	Little Raven	P
Corcorax melanorhamphos	White-winged Chough	P
Struthidea cinerea	Apostlebird	P
Alauda arvensis	Eurasian Skylark	U
Ptilonorhynchus violaceus	Satin Bowerbird	P
Mirafra javanica	Horsfield's Bushlark	P
Anthus australis	Australian Pipit	P
Passer domesticus	House Sparrow	U
Passer montanus	Eurasian Tree Sparrow	U
Carduelis carduelis	European Goldfinch	U
Neochmia temporalis	Red-browed Finch	P
Stagonopleura guttata	Diamond Firetail	V
Taeniopygia bichenovii	Double-barred Finch	P
Taeniopygia guttata	Zebra Finch	P
Dicaeum hirundinaceum	Mistletoebird	P
Hirundo neoxena	Welcome Swallow	P
Petrochelidon ariel	Fairy Martin	P
Petrochelidon nigricans	Tree Martin	P
Acrocephalus australis	Australian Reed-Warbler	P
Cincloramphus cruralis	Brown Songlark	P
Cincloramphus mathewsi	Rufous Songlark	P
Cisticola exilis	Golden-headed Cisticola	P
Megalurus gramineus	Little Grassbird	P

Scientific Name	Common Name	Status
Zosterops lateralis	Silvereye	P
Turdus merula	Eurasian Blackbird	U
Zoothera dauma	Unindentified Ground Thrush	P
Sturnus vulgaris	Common Starling	U

P= Protected, V= Vulnerable, E = Endangered, U= Introduced

Mount McKenzie
554m
HUME HWY
Kelly Ck
BOWLERS RD
Back Ck
Devils Ck
Reddalls
Valley
Ten Mile Ck
Serpentine Ck
MURPHY'S RD
Lowes Hill
521m
Scent Bottle Ck
Chinamans Hat
646m
Mount McLaurin
728m
MANDARING RD
Wantagong Ck
Yarra Yarra Ck
King Parrot Ck
Lankeys Creek
Camping Area
Mountain Ck
Woomargama
Reddall Ck
Mount Narra Narra
862m
Spring Ck
Sixpenny Ck
GALVINS RD
Tipperary Ck
Tipperary Trig
934m
YENSCHS RD
LANKEYS CREEK RD
Lankeys Ck
Dickson Trig
374
Wrights Hill
398
Webb Trig
454
Oaky Bulga Trig
620m
Wilson Ck
TIN MINES RD
Cockatoo Ck
MATHEWSONS TR
Water Ck
FERNDALE RD
Mountain Ck
Norths Lookout
Mount Jergyle
889m
Tin Mines
Camping Area
COCKATOO
CREEK TR
Bucken Ck
Woomargama
National
Park
Woomargama
State Conservation Area
CURLS TR
MILLERS RD
Swamp Ck
HOOK'S TR
Tunnel Ck
Spring Ck
SOUTH CREEK TR
RIDGE TR
South Ck
Home Flat Ck
MOUNT JERGYLE TR
PHILLIS TR
Basin Ck
Stony Ck
AVOCA TR
Seven Mile Ck
Samual Bollard
Camping Area
TUNNEL RD
Sweetwater Ck
PEARDON'S TR
HANELS TR
WARAWEE TR
Talmalmo Trig
759m
SEVEN MILE CREEK RD
Woomargama
State Forest
Mount Paynter
830m
TOWER TR
Tom Lunts Ck
Jingellic Trig
1000m
(radio repeater)
Jingellic
Jingellic Ck
Mullengandra
State
Conservation
Area
Mullengandra
Nature Reserve
Reedy Ck
Wagra Ck
WAGRA TR
Woomargama
State Conservation
Area
Honeysuckle Ck
Dora Dora
Talmalmo
Mount Wombat
530m
Murray River
Abrahams
Bosom
Mount Maraket
720m
Murray
River
Mount Porcupine
537m
MURRAY RIVER RD
RIVER RD
Flaggy Ck
The Oaks
501m
Mount Lawson
State Park
Stony Ck
Red Bank Ck
Mount Alfred
Wagra Mountain
912m
N
W
E
S
0 1 2 3 4 5
Kilometres
Mullengandra
Nature Reserve
Wymah
Mount Granya
State Park

Locked Gate
Town
Trig Site
Mountain
Lookout
Camping Area
Camping Area
(Off Park)
Hume & Hovell
Walking Track
Park Road
(Public Access)
Management/
Private Trail
(No Public Access)
Proposed Trail
Major Public Road
Public Road
River/Creek
State Border
Lake Hume
National Park/Nature Reserve
State Conservation Area
NSW State Forest/Victorian Reserve
Pine Plantation