

MONKERAI NATURE RESERVE

PLAN OF MANAGEMENT

National Parks and Wildlife Service

Part of the Department of Environment and Climate Change NSW

July 2008

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

Inquiries about Monkerai Nature Reserve or this plan of management should be directed to the Ranger at the NPWS Barrington Tops Area Office, 59 Church Street, PO Box 236, Gloucester NSW 2422 or by telephone on (02) 6538 5300.

Cover photo is of the bark of Eucalypt species that form part of the spotted gum - grey gum association found in Monkerai Nature Reserve.

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FOREWORD

Monkerai Nature Reserve covers an area of 865 hectares and is located approximately 10 kilometres north of Dungog.

Monkerai Nature Reserve lies within an identified regional wildlife corridor that links Barrington Tops National Park with other key habitat areas in the lower Hunter Valley. The spotted gum - grey gum vegetation association which occurs over the majority of the reserve is considered regionally significant and poorly represented within conservation reserves.

A variety of native animals have been recorded either within the reserve or within 5 kilometres of the reserve, including 11 threatened species.

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

A draft plan of management for Monkerai Nature Reserve was placed on public exhibition from 24th March until 26th June 2006. 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 facilitating the regeneration of native vegetation in disturbed areas to reduce erosion and sedimentation of streams, finalising and implementing fire management strategies for the reserve, undertaking pest species and weed control, and preparing and implementing a wild dog management plan.

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

Verity Firth
Minister for Climate Change and the Environment

1.0 NATURE RESERVES IN NEW SOUTH WALES

1.1 LEGISLATIVE AND POLICY FRAMEWORK

The management of nature reserves in NSW is in the context of a legislative and policy framework, primarily the *National Parks and Wildlife Act 1974* (NPW Act), the *National Parks and Wildlife Regulation 2002* (NPW Regulation), the *Threatened Species Conservation Act 1995* (TSC Act) and the policies of the National Parks and Wildlife Service (NPWS). Section 72AA of the NPW Act lists the matters to be considered in the preparation of a plan of management. The policies are compiled 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* (EP&A Act) requires the assessment and mitigation of environmental impacts of any works proposed in this plan.

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

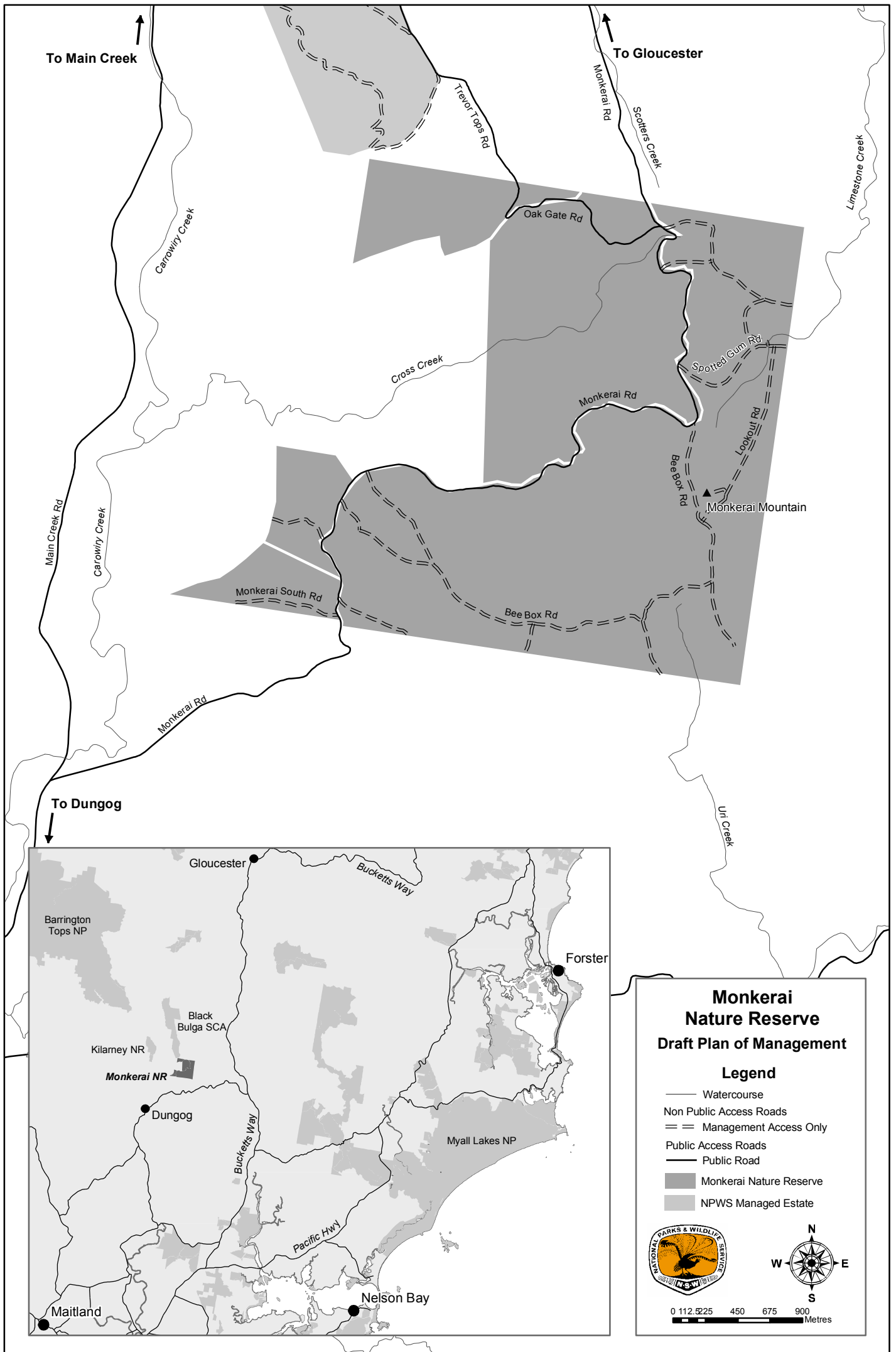
1.2 MANAGEMENT PURPOSES AND PRINCIPLES

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

Under the Act, nature reserves are managed to:

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

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



2.0 MONKERAI NATURE RESERVE

2.1 LOCATION GAZETTAL AND REGIONAL SETTING

Monkerai Nature Reserve (herein referred to as the 'reserve') is named after Monkerai Mountain in the reserve. The reserve covers an area of 865 hectares and is located approximately 10 kilometres north of Dungog on Monkerai Road towards Gloucester (see reserve map). The reserve was gazetted in 1999 when it was transferred from Forests NSW (previously State Forests of NSW) under the *Forestry and National Parks Estate Act 1998* (refer below).

The reserve lies within an identified regional wildlife corridor that links Barrington Tops National Park with other key habitat areas in the lower Hunter Valley (Scotts & Drielsma 2002), both within NPWS and State Forests estate. The reserve adjoins the southern end of Black Bulga State Conservation Area, which was previously Trevor Tops State Forest. Barrington Tops National Park, Killarney Nature Reserve and Chichester State Forest are located in close proximity to the north-west. The majority of the surrounding private property is grazing land. There is a small area of crown land bordering the south-western corner zoned for public recreation, which is currently used by the Dungog Motorcycle Club. A number of private properties within the area are gazetted as Wildlife Refuges, adding to the corridor available to transiting wildlife.

The reserve is located within Dungog Shire, and adjoins Great Lakes Shire on the eastern and northern boundaries. It falls within the area administered by the Hunter Central Rivers Catchment Management Authority and the Karuah Local Aboriginal Land Council.

The reserve includes several Ministerial roads including Trevor Tops Road, Oak Gate Road, Spotted Gum Road and Monkerai South Trail, which are vested in the Minister for the Environment on behalf of the Crown for the purposes of part 11 of the NPW Act. They were created under the *Forestry and National Parks Estate Act 1998* to ensure that the access arrangements which existed immediately before the reserve's creation (primarily for timber hauling and private property access) could continue. The management of these roads is subject to the provisions of this plan, the NPW Regulation and the requirements of the EPA Act.

Regional Forest Agreements (RFA)

Regional Forest Agreements (RFA) are one of the principal means of implementing the National Forest Policy Statement of 1992. Under this statement, Commonwealth, State and Territory governments 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 Regional Forest Agreements that provide, amongst other things, for ecologically sustainable forest management. The North East RFA covers the reserve. The process leading up to the RFA provided for major additions to the reserve system, including establishment of Monkerai Nature Reserve.

2.2 LANDSCAPE CONTEXT

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 native vegetation through recreational use, cultural practices, the presence of introduced plants and animals and in some cases air and water pollution.

The geology, landform, climate and plant and animal communities of the area, plus its location, have determined how it has been used by humans. The area has been used in the past for forestry operations and grazing. Both these activities have impacted upon the composition of the vegetation within the reserve, through both physical removal and also structural and species modification using fire.

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

2.3 NATURAL AND CULTURAL HERITAGE

Landform, Geology, Soils and Climate

The reserve occupies a north-south ridgeline extending out from Barrington Tops. Monkerai Mountain, at approximately 350 metres, is the highest point and dominates the reserve. The other significant landform feature is the Cross Creek valley and associated catchment, which drains most of the reserve. Cross Creek drains west into Carowiry Creek, which in turn flows into the Williams River. The elevation range of the reserve is 90 to 350 metres above mean sea level.

Two different rock types dominate the geology of the reserve. Two thirds of the reserve lies upon sedimentary rocks within the Wootton Beds, while the north–south ridgeline is upon the Nerong Volcanics. Consequently the soils can be grouped into two categories, those developed from volcanics and those developed from fine-grained sediments (Veness, 1995).

Both soil groups are predominantly clay loams but those of sedimentary origin have more distinct horizons and are generally more complex in layering compared to the soils of volcanic origin. The volcanic soils have a higher stone content in the topsoil layer. The soil groups are rated as being of moderate erodability (Veness, 1995). While both soils have low nutrient levels, the fine-grained sedimentary soils are generally poorer and support the spotted gum (*Corymbia maculata*) communities. Those derived from volcanics, generally have more diverse floristic communities.

The reserve receives an annual average rainfall of 1,020 mm, with a temperature range in the local area of 3-29 °C (CMA, 1985). Higher rainfall occurs during the summer as a result of the influence of weakening tropical cyclones crossing the coast and developing into rain depressions. Warm to hot summer temperatures also generates convection rainstorms which increase precipitation (CMPS&F Environmental, 1995).

Native Plants

The reserve was identified as a priority conservation area under the Comprehensive Regional Assessment (CRA) process. The reserve contains a number of priority species including thick-leaved mahogany (*Eucalyptus carnea*), small-fruited grey gum (*E. propinqua*), grey gum (*E. canaliculata*) and spotted gum.

Of particular significance to the reserve is the occurrence of the spotted gum - grey gum association that is considered regionally significant and poorly represented within conservation reserves. The spotted gum - grey gum association is the predominant vegetation type and occurs over the majority of the reserve.

The reserve was logged prior to gazettal and contains large sections of regrowth. The majority of the reserve consists of drier foothills country with thin rocky soils supporting open forest with a sparse grassy understorey. Grey ironbark (*E. placita*) also occurs in the reserve, while understorey species include forest oak (*Allocasuarina torulosa*), cherry ballart (*Exocarpos cupressiformis*), narrow-leaved geebung (*Persoonia linearis*), prickly Moses (*Acacia ulicifolia*), hickory wattle (*Acacia implexa*), white dogwood (*Ozothamnus diosmifolius*), large-leaf hop-bush (*Dodonaea triquetra*), prickly shaggy pea (*Podolobium ilicifolium*), blady grass (*Imperata cylindrica* var. *major*), false sarsaparilla (*Hardenbergia violacea*), dusky coral pea (*Kennedia rubicunda*), spiny-headed mat-rush (*Lomandra longifolia*) and blue flax-lily (*Dianella longifolia*). The understorey has been modified through past land management practices, primarily fire frequency, resulting in a dominance of blady grass and spiny-headed mat-rush.

The Cross Creek basin contains wet eucalypt forest with a rainforest understorey. The dominant tree species is Sydney blue gum (*E. saligna*) while secondary species include tallowwood (*E. microcorys*), white mahogany (*E. acmenoides*) and turpentine (*Syncarpia glomulifera*). The understorey includes prickly-leaved paperbark (*Melaleuca styphelioides*), sweet pittosporum (*Pittosporum undulatum*), water vine (*Cissus antarctica*) and many other moisture loving species.

No threatened plants or communities have been recorded within reserve although only limited plant surveys have been carried out within the reserve. Slaty red gum (*E. glaucina*), which is listed as vulnerable under the TSC Act, has been recorded within 1 kilometre of the southern boundary of the reserve.

Native Animals

A variety of native animals have been recorded either within the reserve, or within 5 kilometres of the reserve. NSW Wildlife Atlas records, environmental reviews (Floyd, 2001), Forest NSW publications (White 1994) and consultants reports (Ecotone 1995) list 25 bird species, 16 mammals and 9 reptile and amphibian species within the reserve or within a 5-kilometre radius of the reserve.

Of these the following are listed as vulnerable under the TSC Act, powerful owl (*Ninox strenua*), barking owl (*N. connivens*), grey-crowned babbler (*Pomatostomus temporalis temporalis*), glossy black-cockatoo (*Calyptorhynchus lathami*), olive whistler (*Pachycephala olivacea*), koala (*Phascolarctos cinereus*), spotted-tailed quoll (*Dasyurus maculatus*), brush-tailed phascogale (*Phascogale tapoatafa*), yellow-bellied sheath-tail bat (*Saccolaimus flaviventris*), stuttering frog (*Mixophyes balbus*), and Stephen's banded snake (*Hoplocephalus stephensii*).

A Threatened Species Priorities Action Statement, which identifies actions and priorities for threatened species, population and ecological community within the state, has been prepared. Draft recovery plans have been prepared for large forest owls (which includes the powerful owl), the barking owl and the koala.

The reserve is recognised by the NPWS as having key habitat values and forms an important wildlife corridor between the Barrington Tops region and the coast (Scotts & Drielsma, 2002).

Aboriginal Cultural Heritage

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

The area was home to the Worimi tribal group, who inhabited the lands from Port Stephens in the south, to Forster on the coast and west to Barrington Tops. The Worimi people were of the Kattang language group (Brereton et al 1998). Koettig (1986) refers to a number of campsites consisting of up to 10 gunyahs (shelters) being recorded in the mid 1800s in the Karuah River area, slightly east of the reserve. Byrne (1984) suggests that highland rainforested areas such as the Barrington Tops area were tribal hinterlands and used occasionally rather than frequently. Documentation regarding local Aboriginal use and occupation of the area is limited and there are no recorded Aboriginal sites within the reserve.

The Karuah Local Aboriginal Land Council and the Worimi people represent the contemporary Aboriginal involvement in the reserve. The NPWS adopts a collaborative approach to the management of Aboriginal cultural values associated with the reserve, through ongoing consultation with the Aboriginal community.

Non-Aboriginal Cultural Heritage

The history of European settlement in the area commenced with incentives of land grants offered by Governor Macquarie to open more lands for pastoral and agricultural activities. Settlement in the Dungog area began in the 1820s after the area was opened up by the cedar getters.

Up to the 1890s, cedar cutting and dairying were the most important industries. After the 1890s cedar began to lose prominence, as it became rare under the impact of unsustainable harvesting. The construction of the nearby Chichester Dam in the 1920s re-stimulated local sawmilling industries as significant amounts of timber was cleared from the dam site. This resulted into logging operations expanding into less accessible timbered country. By the 1930s timber cutting was a major feature of the local economy (Murray 1995).

The reserve was originally gazetted as Dungog State Forest No 898 on 18 April 1947. There is very little evidence of this past land use other than the remaining stumps.

A set of yards adjacent to Monkerai Road on the western boundary of the reserve is the only known historic structure within the reserve. The yards are believed to be associated with the relatively recent use of the area for grazing, prior to the reserve being gazetted, and preliminary assessment indicates they are of limited significance.

2.4 ACCESS AND PUBLIC USE

Monkerai Road passes through the reserve and provides 2WD all weather public access to the reserve. It provides a link between the Bucketts Way and Dungog, and is often used by local traffic.

Prior to gazettal as a nature reserve the forest experienced minor recreational use. This included trail bike riding and four wheel driving, as well as bushwalking and nature appreciation. These activities continue today though at a decreased level.

There are no visitor facilities in the reserve, and visitors are encouraged to be self-reliant. Horse riding, cycling and camping are not currently known to occur in the reserve.

2.5 OTHER USES

Apiculture

Two non-active apiary sites are located within reserve and are recognised as an 'existing interest' under the NPW Act, as they existed prior to the transfer of the land to NPWS.

Private property access

Oak Gate and Trevor Tops Roads are required for private property access and will also be maintained as public roads. Spotted Gum Road is a management trail that is also a Ministerial Road and required for access to private property (refer to sections 2.1 and 2.6). Monkerai South Trail is required to access a crown lease. Both these trails will continue to provide access to these properties but will not be available for general public vehicular access.

2.6 MANAGEMENT OPERATIONS

In addition to the above roads, there are a number of trails in the reserve. These trails have been assessed for fire and other management purposes. The trails required for management purposes are Bee Box, Lookout, Spotted Gum, and Monkerai South roads/trails and these will be retained as management trails (see map). Most of these trails have been maintained at a 4WD dry weather standard, however Spotted Gum Road has deteriorated to a lesser standard. Oak Gate and Trevor Tops Roads will remain as public access roads. There are also a number of as yet un-named 4WD management trails that will be retained (see map). Trails no longer required for management purposes will be rehabilitated.

2.7 THREATS TO RESERVE VALUES

Introduced Species

The Hunter Region Pest Management Strategy (NPWS 2002) broadly identifies the weed and feral animal priorities and control options for the region. A separate pest management strategy has not yet been prepared for the reserve.

There are a number of introduced species that have been identified which threaten the reserve's biodiversity values. There are infestations of pest plant species, primarily confined to the roads and trail edges and drainage lines, such as the pink variety of lantana (*Lantana camara*) and to a lesser extent crofton weed (*Ageratina adenophora*). There are also a number of isolated outbreaks of weed species, which only reproduce vegetatively, like black-eyed Susan (*Thunbergia alata*) and succulents adjacent to trails and roads, which are most likely due to refuse dumping. There are no known noxious weed species recorded in the reserve, though blackberry (*Rubus fruticosus*) has been recorded in an area adjacent to the north of the reserve.

Weed control programs have been undertaken in the reserve since 1996. These programs have primarily targeted weeds occurring along roadside edges to improve accessibility.

Though no feral animals have been recorded within the reserve, foxes (*Vulpes vulpes*), feral cats (*Felis catus*) and wild dogs (*Canis familiaris*) have all been sighted on adjacent properties. Predation by the red fox has been listed as a key threatening process under the TSC Act.

Wild dogs including dingoes have been declared as pest animals under the *Rural Lands Protection Act 1998* (RLP Act). The reserve is listed as part of a collective list of conservation reserves as a key conservation area for dingo (*Canis lupus dingo*) populations under Schedule 2 of the RLP Act. It is grouped with a number of State Forests and other conservation reserves as a dingo management area. The RLP Act requires public land managers, such as the NPWS, to assist in the preparation of a wild dog management plan for dingo management areas. These plans are to identify methods for the control of wild dogs and the conservation of dingoes in these areas and are to be approved by Maitland Rural Lands Protection Board (RLPB).

Illegal Vehicular Use

There are numerous management trails within the reserve that are used occasionally by recreational vehicles (refer to section 2.4). Activities such as four wheel driving and trail bike riding are not compatible with the management principles of a nature reserve. In addition the trails are badly eroded in sections and a number of erosion gullies have formed on the steeper slopes, with large amounts of sediment being deposited at the base of the slopes.

While there is currently limited known usage of this type of activity there is potential for erosion and other detrimental environmental impacts.

Fire

Fire is a natural feature of the environment of the reserve and is essential to the survival of some plant communities. It is one of the continuing physical factors influencing the Australian environment. However, inappropriate fire regimes have been identified as a key threatening process affecting the biological diversity of NSW as frequent fire can lead to loss of particular plant and animal species and communities. Fire could also damage cultural features and fences and threaten neighbouring land.

The majority of the reserve's contemporary fire history relates to forest management burns in the northern section of the reserve. These low intensity fires were frequently used following timber harvest. It is also likely that leaseholders used regular low intensity fires to promote new growth for grazing. Unfortunately the reserve also has a history of arson.

NPWS regards cooperative fire management as essential for the protection of life and surrounding property, as well as for protection of the natural and cultural heritage of the reserve. NPWS maintains cooperative arrangements with surrounding landowners and Rural Fire Service (RFS) brigades and is actively involved in the Lower Hunter Zone Bush Fire Management Committee. Cooperative arrangements include fuel management, support for neighbours, information sharing and preparation of district bushfire management plans for the area covered by this committee. The NPWS is a fire authority under the *Rural Fires Act 1997* and is required to implement the provisions of district fire management plans.

Fire management strategies for the reserve are being included in the "Barrington Tops National Park and Surrounding Reserves Fire Management Strategies", currently in preparation. Annual hazard reduction programs are also submitted to the local Bush Fire Management Committee.

Fire in the reserve will be managed to protect life and property as well as to maintain ecosystems and biodiversity. Any hazard reduction burns should limit the use of fire in the wet eucalypt forest and avoid fire in rainforest communities.

Fire requirements for most plant species can be summarised on the basis of vegetation communities. There is a threshold in fire regime variability, which marks a critical change from high species diversity to low species diversity. The following fire regime guidelines have been identified for the reserve.

Table 1. Fire Interval Guidelines for Protection of Vegetation Communities

Vegetation Community	Minimum Interval*	Maximum Interval*	Notes
Rainforest	n/a	n/a	Fire should be avoided
Wet sclerophyll forest	25 years	60 years	Crown fires should be avoided at the lower end of the interval range
Grassy dry sclerophyll forest	5 years	50 years	
Scrubby dry sclerophyll forest	7 years	30 years	
Grassland	2 years	10 years	Some intervals greater than 7 years should be included in coastal areas.

Source: Bradstock *et al* (2003).

* intervals given are tentative due to insufficient data.

Firewood Collection

Removal of dead wood and dead trees is damaging to the environmental integrity of the reserve and is listed as a key threatening process under the TSC Act. It is not permitted in the reserve, however, due to the reserve's past history as a State Forest firewood collection was previously allowed and is an ongoing threat to the reserve's values.

3.0 MANAGEMENT ISSUES AND STRATEGIES

Current Situation	Desired Outcomes	Strategies	Priority
<p>Soil and water conservation</p> <p>Catchment values are threatened by the numerous existing vehicular trails (mostly former logging trails), many of which are in a state of disrepair and prone to erosion.</p>	<ul style="list-style-type: none"> • There is decreased soil erosion from reserve management activities and visitor use. • Improvement in the water quality and health of watercourses within the reserve. 	<ul style="list-style-type: none"> • Retain roads and management trails shown on reserve map. All other trails will be closed and allowed to regenerate. • Undertake all works, such as trail maintenance, in a manner that minimises erosion and water pollution. • Facilitate the regeneration of native vegetation in disturbed areas to reduce erosion and sedimentation of streams (refer to <i>Native plant and animal conservation</i>). 	<p>High</p> <p>Medium</p> <p>Medium</p>
<p>Native plant and animal conservation</p> <p>The reserve forms part of a wildlife corridor important for the movement of species.</p> <p>Some limited native plant surveys have been undertaken in the reserve, though no threatened plant species have been recorded. The threatened species slaty red gum is recorded in neighbouring areas and may be present in the reserve.</p> <p>The spotted gum-grey gum association is considered regionally significant.</p> <p>Eleven threatened animal species are recorded in the reserve or within 5 kilometres of the reserve.</p> <p>There are threats from the removal of habitat due to the occasional illegal collection of firewood.</p>	<ul style="list-style-type: none"> • There is no reduction in native plant and animal species within the reserve, particularly significant species or reduction in habitat diversity. • Structural diversity and habitat values are restored in areas subject to past disturbance. • There is an increased knowledge of native plants and animals and their ecological requirements. • Illegal firewood collection is stopped. 	<ul style="list-style-type: none"> • Encourage surveys for threatened plant and animal species, in particular the slaty red gum. • Undertake opportunistic monitoring of vegetation recovery post logging and since grazing impacts have been removed. • Work with neighbours and local Landcare groups to encourage conservation of remnant native vegetation in the vicinity of the reserve, particularly in those areas identified as corridors or containing key fauna habitat. • Implement threatened species priority action statements and draft recovery plans for large forest owls, barking owl and koala and other threatened species when they are prepared. • Install signage advising that “firewood collection is prohibited”. • Respond to all reports of illegal firewood collection promptly. 	<p>Medium</p> <p>Low</p> <p>High</p> <p>High</p> <p>High</p> <p>High</p>

<p>Introduced species</p> <p>A Regional Pest Management Strategy has been prepared that prioritises pest species control programs.</p> <p>The main pest plant species of concern are lantana, crofton weed and black-eyed Susan. Pest plant species are generally confined to road edges and drainage lines. Black-eyed Susan and succulents are located in a number of areas generally where garden refuse has previously been dumped.</p> <p>Foxes are likely to be present in the reserve and pose a major threat to biodiversity.</p> <p>No pest species management plan exists for the reserve.</p> <p>No wild dogs have been recorded in the reserve, though it is considered to contain high quality dingo habitat and has been listed as a dingo management area.</p>	<ul style="list-style-type: none"> • Pest species are controlled and, where possible, eradicated from the reserve. • Where eradication is not feasible, population and distribution of pest species will not expand beyond their current extent. • The impact of pest species on native species and neighbouring lands is minimised. • Control of pest species has minimal impact on native species. 	<ul style="list-style-type: none"> • Undertake pest species control in the reserve in accordance with the Regional Pest Management Strategy. • Undertake control programs for lantana and reactive programs for other pest plant species as they are identified. Remove infestations of black-eyed Susan. • Monitor for noxious and significant environmental weeds and undertake control measures as required. • Monitor fox activity and implement control programs as necessary. • Prepare a pest species management plan for the reserve. • Undertake integrated pest control programs with the Rural Lands Protection Board, and park neighbours. • Undertake community education program to reduce refuse dumping. • Assist in the preparation and implementation of a wild dog management plan in consultation with relevant stakeholders including Maitland RLPB. 	<p>High</p> <p>High</p> <p>High</p> <p>Medium</p> <p>Medium</p> <p>High</p> <p>Low</p> <p>Medium</p>
<p>Fire management</p> <p>Observation of the current plant species diversity suggests that fire has been extensively used as a management tool within the reserve in the past. Arson is also a major concern.</p>	<ul style="list-style-type: none"> • Life, property and natural and cultural values within and adjacent to the reserve is protected from fire. 	<ul style="list-style-type: none"> • Monitor the impacts of fire on ecosystems within the reserve and encourage appropriate research (refer to <i>Native plants and animal conservation</i>). 	<p>High</p>

<p>Sections of wet eucalypt forest with rainforest understorey are sensitive to fire and biodiversity in these areas may have been impacted by past fire regimes.</p> <p>Detailed fire management strategies are currently being drafted for the reserve, as part of the Barrington Tops National Park and Surrounding Reserves Fire Management Strategies.</p>	<ul style="list-style-type: none"> • Fire regimes are appropriate for conservation of native plants and animal communities, particularly threatened species • Maintain scenic and catchment values through the application of appropriate fire regimes. • Neighbours and nearby communities understand the requirements for, and cooperate in applying, fire management objectives and prescriptions for the reserve. 	<ul style="list-style-type: none"> • Finalise and implement fire management strategies for the reserve. • Where possible, exclude fire from fire sensitive communities, such as rainforest and areas that have been subject to too frequent burning. • Continue to actively participate in the Lower Hunter Zone Bush Fire Management Committee. • Maintain coordinated and cooperative arrangements with local Rural Fire Service brigades, Dungog Shire Council and neighbours with regard to fuel management and fire suppression. 	<p>High</p> <p>High</p> <p>High</p> <p>High</p>
<p>Cultural heritage</p> <p>The reserve is located within the boundaries of the Worimi tribal group and the Karuah Local Aboriginal Land Council area.</p> <p>No Aboriginal sites have been recorded in the reserve, however, no formal surveys have been undertaken within the reserve for sites of Aboriginal cultural significance.</p> <p>Although most of the reserve has been used for timber production and grazing in the past little is known about the history of the reserve, other than one set of yards.</p>	<ul style="list-style-type: none"> • There is improved knowledge about the cultural heritage values of the reserve. • Any cultural features or values in the reserve are recorded and conserved. • The history of the reserve is documented. • Aboriginal heritage values are protected in partnership with the local Aboriginal community. 	<ul style="list-style-type: none"> • Consult and involve the Worimi people, Karuah Local Aboriginal Land Council and appropriate knowledge holders in all aspects of management of Aboriginal sites, places and values. • Encourage appropriate studies into Aboriginal and non-Aboriginal cultural heritage in the reserve, including formal documentation of cultural resources and locations (refer to Research section). • Assess yards and manage as appropriate to assessment outcomes. 	<p>High</p> <p>Medium</p> <p>Low</p>

<p>Visitor Use</p> <p>Current visitor use includes bushwalking, nature appreciation, trail biking and four wheel driving.</p> <p>Identification signage has been erected at the public access points.</p> <p>Monkerai Road (a non-park road) and Oak Gate and Trevor Tops Roads provide scenic driving opportunities for visitors to the reserve.</p> <p>No formal visitor facilities are provided within the reserve.</p>	<ul style="list-style-type: none"> • Nature based, low impact, self reliant recreation opportunities available in reserve. • The local community is aware of the significance of the reserve and of management programs undertaken to protect reserve values. • Visitor use remains low, is ecologically sustainable, and is consistent with the management principles 	<ul style="list-style-type: none"> • Only low key self reliant bushwalking will be permitted within the reserve. • Erect regulatory and trail identification signage where appropriate. • Organised educational groups may be permitted to use the reserve, subject to limits on numbers, activities and location and other conditions deemed necessary to protect reserve values and minimise impacts. • Camping and horse riding will not be permitted in the reserve. Private vehicles will only be permitted on public access roads. • Levels and impacts of visitor use will be monitored and measures undertaken to reduce impacts where they are found to be unacceptable. • Promote community understanding and appreciation of the conservation values of the reserve through contact with neighbours and community organisations as needed. 	<p>High</p> <p>High</p> <p>Medium</p> <p>Medium</p> <p>High</p> <p>Medium</p>
<p>Research</p> <p>Some studies of native plants and animals have been undertaken in the reserve, however no formal studies into cultural heritage have occurred.</p> <p>Further study is needed to improve understanding of the natural and cultural heritage of the reserve, the processes that affect them and the requirements for management of particular species.</p>	<ul style="list-style-type: none"> • Undertake research that enhances scientific knowledge, assists management of the reserve and has minimal environmental impact. 	<ul style="list-style-type: none"> • Undertake or encourage research to improve knowledge and management of the natural and cultural heritage of the reserve. • Priority research areas are: <ul style="list-style-type: none"> - impacts of previous / proposed fire regimes on vegetation diversity; - threatened species presence / habitat (plant and animal); - vegetation community mapping; - Aboriginal cultural heritage. 	<p>High</p> <p>Medium</p>

<p>Management operations and other uses</p> <p>There are many existing trails in the reserve that have been maintained to varying levels in the past. Some of these are Ministerial Roads that provide access to neighbouring private property.</p> <p>Some management trails and a number of former small logging trails are no longer required for management purposes (refer to section 2.6). Public vehicles are not permitted on management trails.</p> <p>There are two existing apiary sites in the reserve (refer to section 2.5).</p> <p>Competition from feral honeybees is identified in NSW as a key threatening process. Breeding colonies of feral honeybees have the potential to occupy large tree hollows and to affect the availability of hollows for brush-tailed phascogale and glossy black-cockatoo.</p>	<ul style="list-style-type: none"> • Management facilities adequately serve management needs and have acceptable impact. • Adjoining private property holders retain appropriate access to their properties. • Existing interests are managed to minimise impacts to the reserve's values. 	<ul style="list-style-type: none"> • Upgrade Spotted Gum Road. Maintain Spotted Gum, Trevor Tops and Oak Gate Roads and Monkerai South Trail to 2WD dry weather road standard. • Access for private property owners along management trails that are Ministerial Roads will be retained but they will not be available for general public use, with the exception of Oak Gate and Trevor Tops Roads. • Maintain Bee Box and Lookout Trails, and the unnamed trails in the north-east corner and near the southern boundary of the reserve, to 4WD dry weather road standard. • Gate and lock these management trails to exclude public vehicles. Permit access by authorised personnel as necessary. • Trails not required for management purposes will be closed, rehabilitated and/or allowed to revegetate. • Change the title from 'Road' to 'Trail' where trails are used for management purposes (or controlled access to private property or apiary sites) only. Where necessary, advise relevant agencies and visitors so that maps and signage can be progressively updated. • Apiary sites will be managed in accordance with NPWS Policy. They will also be monitored in accordance with the TSC Act. 	<p>High</p> <p>High</p> <p>Medium</p> <p>Medium</p> <p>Medium</p> <p>Low</p> <p>Medium</p>
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Legend for priorities

High priority actions are those imperative to achievement of management objectives. These actions need to be implemented in the near future to prevent degradation of natural and cultural values or the physical resources within the park.

Medium priority actions are those that are necessary to achieve management objectives but will be implemented as resources become available because the time frame for their implementation is not urgent.

Low priority actions are desirable to achieve management objectives but can wait until resources become available.

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