

BOOROOLONG NATURE RESERVE
PLAN OF MANAGEMENT

NSW National Parks and Wildlife Service

November 2003

This plan of management was adopted by the Minister for the Environment on 10th November 2003.

Inquiries about Booroolong Nature Reserve or this plan of management should be directed to the ranger at the Armidale Area Office, 85 Faulkner Street, Armidale, or by telephone on 02 6776 0000.

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FOREWORD

Booroolong Nature Reserve is located on the central New England Tablelands approximately 30 km (by road) north-west of Armidale.

The reserve is mostly covered by a floristically diverse layered open forest. Significant areas of cleared grassland occur in the far north of the reserve which are dominated by a mixture of native and exotic perennial grasses. Narrow strips of riparian vegetation occur in some of the moister valleys and along the ephemeral creek lines.

Booroolong Nature Reserve is significant for the refuge it provides for the endangered Booroolong frog and the endangered bush stone-curlew. It may also be regionally significant for koalas.

Access to the reserve by members of the public is restricted as all access is through private land.

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 a reserve will be managed in the years ahead.

A draft plan of management for Booroolong Nature Reserve was placed on public exhibition for three months from 18th October 2002 until 3rd February 2003. The exhibition of the plan of management attracted 3 submissions which raised 4 issues. All submissions received were carefully considered before adopting this plan of management.

This plan of management establishes the scheme of operations for Booroolong Nature Reserve. In accordance with section 76 of the *National Parks and Wildlife Act 1974*, this plan of management is hereby adopted.

BOB DEBUS
Minister for the Environment

1. NATURE RESERVES IN NEW SOUTH WALES

1.1 LEGISLATIVE AND POLICY FRAMEWORK

The management of nature reserves in New South Wales (NSW) is in the context of the legislative and policy framework, primarily the *National Parks and Wildlife Act 1974* (NPW Act), the *Threatened Species Conservation Act 1995* (TSC Act) and the National Parks and Wildlife Service Field Management Policies. The Field Management Policies are a compilation of policies arising from the legislative background, the corporate goals of the National Parks and Wildlife Service (NPWS) and internationally accepted principles of park management. They relate to nature conservation, Aboriginal and historic site conservation, recreation, commercial use, research and communication. Other legislation, international agreements and charters may also apply to management of the area. In particular, the *NSW Environmental Planning and Assessment Act 1979* requires the assessment and mitigation of environmental impacts of any works proposed in this plan.

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

1.2 MANAGEMENT OBJECTIVES

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. BOOROOLONG NATURE RESERVE

2.1 LOCATION, GAZETTAL AND REGIONAL SETTING

Booroolong Nature Reserve (referred to herein as 'the reserve') is located on the central New England Tablelands approximately 30 km (by road) north-west of Armidale. The location of the reserve, nearby NPWS estate and towns are shown in figure 1.

The reserve is one of 12 small, isolated reserves in the south of the New England Tablelands bioregion (an area defined by a combination of repeated biological and geographic criteria, rather than geopolitical considerations). These reserves were gazetted to conserve remnants of previously widespread Tablelands vegetation communities as part of the Regional Forest Agreement (RFA) process.

The reserve has an area of 865 ha and was dedicated in 1999. The reserve was state forest prior to becoming a nature reserve. Public access to the reserve is not possible as the reserve is surrounded by private land.

The reserve lies within Armidale Dumaresq Shire. Much of the surrounding land has been extensively cleared and is used for grazing and other rural activities.

This plan applies both to the land currently reserved as Booroolong Nature Reserve and to any future additions to the reserve. Where management strategies or works are proposed for additions, that are not consistent with the plan, an amendment to the plan will be required.

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 Australians continue to influence bushland through recreational use, cultural practices, the presence of introduced plants and animals and in some cases air and water pollution.

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

2.3 NATURAL AND CULTURAL HERITAGE

Landform, Geology and Soils

The reserve is a gently westward sloping landform on the edge of the New England Plateau. The southern section of the reserve is undulating with elevation ranging from 1190 to 1331 metres. The northern section of the reserve is steeper, with rolling hills from 1170 to 1270 metres elevation, then levels out to flat areas leading to Booroolong Creek on the northern boundary of the reserve. Slopes within the reserve range from 5 to 15%.

The reserve is composed of two unique geological units. The Sandon beds (metasediments) cover the majority of the reserve, except for the south-eastern section of the reserve, which is composed of a geological formation known as the Wandsworth volcanic group.

Soils within the reserve are yellow podzolics and alluvials. The yellow podzolics, occupying the upper and mid-slope areas, are generally shallow and very stony. The alluvial soils are associated with drainage depressions where deposition of fine materials has occurred with insufficient time for structural development.

These soils have low erodibility potential due to low to moderate concentrations of water flow. Topsoil and subsoil materials generally have a moderate to very good engineering suitability for untreated and treated roads. Good aggregate stability of these soils also promotes slope stability.

Topsoil materials in the reserve are very high in available phosphorus and organic matter, which may cause them to be somewhat water repellent. The topsoil is moderately permeable but becomes very hard, and less permeable, when dry. This is particularly noticeable along the lower creek flats. Subsoils are high in organic matter but low in nutrients and available phosphorus. They are neutral and moderately hardsetting.

Booroolong Creek flows along the northern boundary of the reserve and is a relatively permanent body of water. There are six minor catchment areas within the reserve that support ephemeral streams draining to the west of the reserve into Booroolong Creek within the Gwydir River catchment.

Native Flora

The reserve is mostly covered by a floristically diverse layered open forest dominated by New England stringybark (*Eucalyptus caliginosa*), narrow-leaved peppermint (*E. radiata*) and silver-top stringybark (*E. laevopinea*). Less common trees which occur in small localised patches include mountain gum (*E. dalrympleana* subsp. *heptantha*) and Williams stringybark (*E. williamsiana*).

The shrub layer varies from sparse to moderately dense with the most common species being silver wattle (*Acacia dealbata*), guinea flowers (*Hibbertia* spp.), peach heath (*Lissanthe strigosa*) and common rice-flower (*Pimelea linifolia*).

The ground layer consists of native grasses such as snow grass (*Poa sieberiana*), silver-top wallaby grass (*Chionochoa pallida*) and kangaroo grass (*Themeda australis*). There is also a variety of herbs of which small St Johns wort (*Hypericum gramineum*),

hairy speedwell (*Veronica calycina*) and small bedstraw (*Galium propinquum*) are amongst the most common.

Significant areas of cleared grassland occur in the far north of the reserve which are dominated by a mixture of native and exotic perennial grasses. Snow grass, kangaroo grass, wire grasses (*Aristida spp.*) and stink grass (*Eragrostis cilianensis*) are particularly common. The herb layer consists of a variety of species such as catsear (*Hypochaeris radicata*), sheeps burr (*Acaena nova-zelandiae*) and white clover (*Trifolium repens*). The high proportion of weeds in the grassland communities is probably a reflection of past land use such as grazing, timber removal and the movement of vehicles through the area.

Narrow strips of riparian vegetation occur in some of the moister valleys and along the ephemeral creeklines. Common teatree (*Leptospermum polygalifolium subsp. transmontanum*) and swamp teatree (*L. gregarium*) are common shrubs while the herb layer is usually dominated by variable raspwort (*Haloragis heterophylla*), self heal (*Prunella vulgaris*) and swamp starwort (*Stellaria angustifolia*). Tall grasses, rushes and sedges, such as swamp foxtail (*Pennisetum allopecuroides*), pin rush (*Juncus usitatus*) and tall sedge (*Carex appressa*) often form a dense layer in the wettest areas.

The vulnerable plant species, narrow leaved black peppermint (*Eucalyptus nicholii*), has been recorded in the reserve. The reserve also contains the Australian anchor plant (*Discaria pubescens*), listed as a rare or threatened Australian plant (Briggs & Leigh 1995).

Native Fauna

The forested environments within the reserve support a diverse range of fauna. A survey by the University of New England in 1995 identified 83 native vertebrate species; including 5 frog, 5 reptile, 51 bird, and 22 mammal species within the reserve.

The reserve is significant for the refuge it provides for the endangered Booroolong frog (*Litoria booroolongensis*) and the endangered bush stone-curlew (*Burhinus grallarius*). There are records for the vulnerable eastern bentwing bat (*Miniopterus schreibersii oceanensis*), the vulnerable eastern freetail bat (*Mormopterus norfolkensis*) and the vulnerable koala (*Phascolarctos cinereus*) from within the reserve.

The reserve also provides potential habitat for nomadic nectivores such as the endangered regent honeyeater (*Xanthomyza phrygia*) and the endangered swift parrot (*Lathamus discolor*), and other noteworthy bird species including the musk lorikeet (*Glossopsitta concinna*), the vulnerable square-tailed kite (*Lophoictinia isura*) and vulnerable grey-crowned babbler (*Pomatostomus temporalis*). The vulnerable border thick-tailed gecko (*Underwoodisaurus sphyrurus*) is also likely to be found in this reserve.

Aboriginal History

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 reserve lies within what is believed to be the territory of the Anaiwan people. The Anaiwan are associated with land on the Great Dividing Range surrounding Armidale and south towards Tamworth and Walcha (Tindale 1974).

Prior to European arrival, it is believed that the Tablelands provided resources for year-round occupation, with groups undertaking a series of short journeys, principally within the Tablelands, coupled with seasonal long journeys between the Tablelands and western slopes. Resource use in the Tablelands is believed to have focussed on woodlands, native grasslands and swamplands (Sullivan, undated).

There are Aboriginal sites within the reserve. Stone flakes and a core stone have been identified. Anecdotal evidence suggests that there may be more unrecorded sites within the reserve. There has been no study or research to determine the Aboriginal heritage values of the reserve.

The reserve falls within the Armidale Local Aboriginal Land Council area.

History since European Occupation

The first European to visit the New England Tablelands in 1818 was John Oxley. European squatters began to occupy land soon afterwards.

Several state forests, including Booroolong State Forest, were dedicated in the region in 1917. Harvesting of hardwood commenced in the 1920s. In general, harvesting was sporadic because of the relative isolation of the area and the consequent difficulty in marketing New England timbers (SFNSW, 1995). The reserve has not been logged since the 1950s.

There is evidence of early European occupation in the extreme north-western corner of the reserve beside Booroolong Creek. A small slab hut and small adjoining enclosure exist in this location. There is a planting of exotic trees surrounding this site. Extensive clearing (the result of which is still in evidence, especially in the northern end of the reserve) has been undertaken in the past.

Sections of a wagon track, used to transport produce and bricks during construction of the Armidale to Glen Innes railway line, are evident within the reserve. A major section of this track has been located on portion 55 in the north-west corner of the reserve. This track has significant historic value that requires further investigation.

2.4 RESEARCH AND EDUCATION

The only known research to have occurred in the reserve is in relation to the effects of fire on vegetation. A student from the University of New England (UNE) started this research in 2000 and it is ongoing. The research may provide information valuable for management of the reserve, especially in relation to appropriate fire management regimes.

2.5 VISITOR USE

The reserve has a use history based on approvals granted under the former state forest tenure. Specifically, approvals were provided by State Forests of NSW to the Gaza Training Depot Armidale Barracks 12/16 Hunter River Lancers (for military training exercises), and to the Northern Tablelands Orienteering Club.

Neither of these uses is compatible with the conservation objectives for a nature reserve in accordance with the NPW Act and NPWS policies.

There are no visitor facilities in the reserve. There is no known use of the reserve by members of the public, for activities compatible with a nature reserve, due to public access to the reserve being restricted through private land.

Day use and camping areas exist within Oxley Wild Rivers National Park at Dangars Falls and Gara Gorge within 45 km of the reserve. Reserve identification and regulatory signs are located at the eastern management trail entrance.

2.6 THREATS TO RESERVE VALUES

Introduced Plants

Blackberry (*Rubus fruticosus*), sweet briar (*Rosa rubiginosa*), Pattersons curse (*Echium plantagineum*), black thistle (*Cirsium vulgare*), willows (*Salix spp*), silver poplar (*Populus sp.*), elms (*Ulmus sp.*) and nodding thistles (*Carduus nutans*) have been recorded in the reserve.

Annual control programs have decreased the distribution and occurrence of most of these weeds within the reserve. Sweet briar and willows are only known from small isolated occurrences.

Maintenance of the high voltage electricity transmission line, that has recently been constructed across the reserve, may provide a vector for introduction of weed species. Nodding thistle), which previously was not found in the reserve, has established under a transmission tower. This weed is being controlled by spraying.

Introduced Animals

Exotic and feral animals known to occur in the reserve which are of concern because of their possible impact on native wildlife and habitat, include pigs (*Sus scrofa*), wild deer (*Cervus sp.*), foxes (*Vulpes vulpes*), hares (*Lepus capensis*) and rabbits (*Oryctolagus cuniculus*). Cats (*Felis catus*) may also occur within the reserve.

Straying stock from neighbouring properties are infrequently present in the reserve. Co-operation with neighbouring cattle and sheep owners has proven effective in minimising stock trespass.

Fire

The effects of fire on the biota of the reserve remain unclear. An inappropriate burning regime or wildfire may contribute to a loss of biodiversity within the reserve. Fire could also damage fences and threaten neighbouring land. Fires may occur within the reserve due to natural causes, and may also spread into the reserve from neighbouring land.

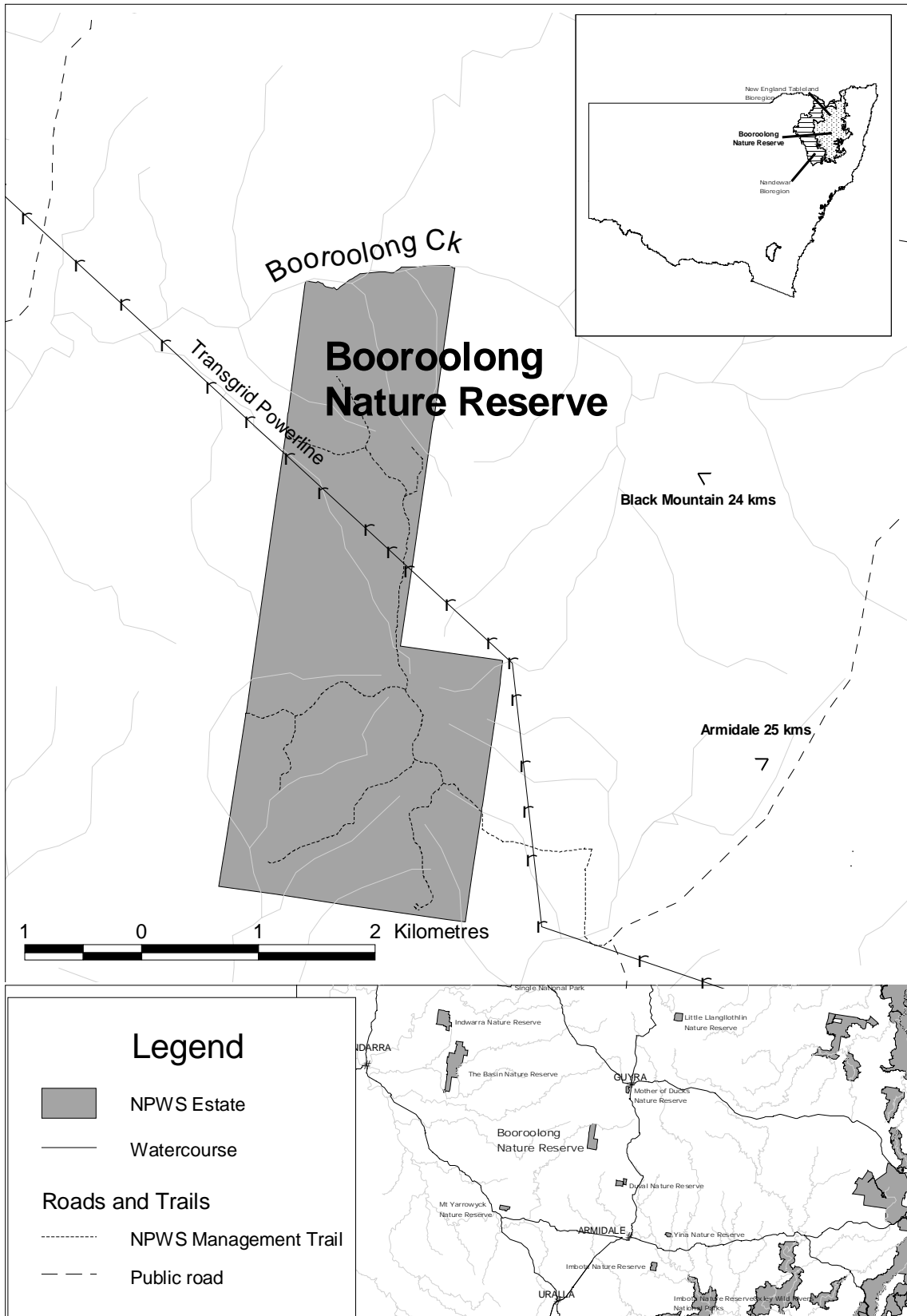
The fire history of the reserve prior to gazettal is unknown. Fire has not been recorded within the reserve for more than 20 years.

Isolation and fragmentation

Clearing of vegetation within the bioregion has resulted in a high loss of biodiversity and fragmentation of habitat. Long term conservation of biodiversity both within the bioregion and the reserve depends upon the protection, enhancement and connection of remaining habitat across the landscape, involving vegetation remnants on both public and private lands.

The reserve is small in size. It is important therefore to consider the reserve in the context of surrounding remnant vegetation. Nearby vegetated areas consolidate the habitat values of the reserve and provide ecological corridors to other surrounding forested areas.

Figure 1: Booroolong Nature Reserve: management infrastructure and regional context



3. MANAGEMENT ISSUES AND STRATEGIES

Current situation	Desired outcomes	Strategies	Priority
Soil conservation			
<p>Management trails and areas disturbed during the construction and siting of the electricity transmission line are specific areas where soil erosion can be a problem.</p> <p>Moderate gully erosion exists along some ephemeral watercourses.</p>	<ul style="list-style-type: none"> • Soil erosion is minimised. 	<ul style="list-style-type: none"> ▪ Management trails will be maintained to appropriate standards (refer to <i>Management Operations</i>). ▪ Ensure any ground disturbance works are undertaken in a manner that minimises erosion and water pollution. ▪ Monitor gully erosion along ephemeral creeks and instigate control measures if necessary. • Ensure erosion control measures are incorporated for works by the electricity provider in accordance with their management agreement (refer to <i>Management Operations</i>). 	<p>High</p> <p>High</p> <p>Medium</p> <p>Low</p>

Current situation	Desired outcomes	Strategies	Priority
<p>Native plant and animal conservation</p> <p>There is limited knowledge about the reserve's rare or threatened species.</p> <p>The reserve is one of the few conserved areas on the New England Tablelands that provide resources and habitat for woodland fauna species in a landscape of substantially cleared grazing land.</p> <p>Long term conservation of the reserve's plant and animal species would benefit from the retention of remaining vegetation on neighbouring properties and roadsides.</p> <p>Cleared areas within the reserve diminish habitat values and potentially increase the prevalence of weeds.</p> <p>Maintenance of the electricity transmission line may require management of vegetation for safety purposes.</p>	<ul style="list-style-type: none"> All native plant and animal species and communities are conserved and enhanced where possible. 	<ul style="list-style-type: none"> Work with relevant neighbours, Landcare groups, local Citizens' Wildlife Corridors groups, vegetation management committees and others to encourage conservation of remnant native vegetation in the vicinity of the reserve and to identify potential wildlife/habitat corridors to link to other remnant native vegetation areas. Encourage and assist the development of voluntary conservation agreements where appropriate for protection of conservation values on adjacent lands. Undertake surveys for rare or threatened plant and animal species as appropriate. Rehabilitate cleared areas within the park by monitoring and controlling weeds, encouraging natural regeneration and, where necessary, supplement with native plantings. Monitor recovery through natural regeneration of the New England peppermint (<i>Eucalyptus nova-anglica</i>) across the cleared flats in the northern section of the reserve. If required, implement strategies to assist recovery and regeneration. Ensure the electricity provider undertakes appropriate vegetation management within the electricity easement in accordance with the management agreement (refer to <i>Management Operations</i>). Where possible, implement strategies outlined in recovery plans in accordance with the Threatened Species Conservation Act 1995. 	<p>High</p> <p>High</p> <p>Medium</p> <p>Medium</p> <p>Medium</p> <p>Medium</p>

Current situation	Desired outcomes	Strategies	Priority
<p>Introduced species</p> <p>Eight weed species have been identified in the reserve, but they are not widespread. These species are blackberry, sweet briar, Patersons curse, black thistle, willows, silver poplar, elms and nodding thistles. These weed species are subject to ongoing control programs in accordance with the draft Northern Tablelands Regional Pest Management Strategy and individual pest management control plans.</p> <p>A survey for other weeds in the reserve has not been undertaken.</p> <p>The small size of the reserve and proximity to other areas with introduced plants allows weed species the opportunity for ongoing invasion.</p> <p>Foxes, pigs, wild deer, hares, and rabbits occur within the reserve and have largely been controlled. Cats may also occur within the reserve. These species can impact on the natural and cultural values of the reserve.</p> <p>Domestic stock sometimes enter the reserve.</p>	<ul style="list-style-type: none"> • Introduced species are controlled and where possible eradicated. 	<ul style="list-style-type: none"> • Control and where possible eradicate introduced plants and animals from the reserve. • Develop and implement a program to monitor the distribution of introduced species in the reserve. • Undertake integrated weed control programs in liaison with the New England Weeds Authority. • Undertake regular integrated feral animal control in cooperation with the Armidale Rural Lands Protection Board, Landcare groups, neighbours and others. • Work with neighbours to ensure domestic stock do not enter the reserve (refer to <i>Management Operations</i>). 	<p>High</p> <p>High</p> <p>Medium</p> <p>Medium</p> <p>Low</p>

Current situation	Desired outcomes	Strategies	Priority
<p>Fire management</p> <p>A fire management strategy is yet to be prepared for the reserve.</p> <p>The effects of fire on the biota of the reserve remain unclear. However, frequent or regular fire can cause loss of particular plant and animal species and communities. Fire can also damage cultural features and fences and threaten neighbouring land.</p> <p>Past history suggests that the reserve poses a low fire risk to persons and property adjacent to the reserve.</p> <p>Fires have not been recorded in the reserve for over 20 years. A small fire (less than 10 ha) occurred in March 2002 on land adjacent to the reserve.</p> <p>Booroolong Creek generally has year round water supply that can be used for fire fighting.</p>	<ul style="list-style-type: none"> • Persons and property are protected from bushfire. • Fire regimes are appropriate for conservation of plant and animal species and communities. • Identified cultural heritage features are protected from damage by fire. • Unscheduled fires leaving or entering the reserve are controlled. • All of the reserve is not burnt in a single wildfire event. 	<ul style="list-style-type: none"> • Prepare and implement a fire management strategy for the reserve. • Participate in district Bush Fire Management Committees. • Maintain coordination and cooperation with the Rural Fire Service, the Shire Council and neighbours with regard to fuel management and fire suppression. • Maintain, as far as possible, a fire free interval of at least 10 to 15 years in all dry sclerophyll forest types within the reserve. • Encourage further research into appropriate fire regimes for the reserve. • Prescribed fire will only be used to achieve fire regimes appropriate for maintenance of habitat in accordance with the fire management plan. • Prepare agreements with neighbours for access to water sources during fire emergencies. • Prohibit camp fires and other unauthorised fires in the reserve to remove a potential ignition source for fires (refer to <i>Public Use</i> below). 	<p>High</p> <p>High</p> <p>High</p> <p>High</p> <p>Medium</p> <p>Medium</p> <p>Medium</p> <p>Medium</p>

Current situation	Desired outcomes	Strategies	Priority
<p data-bbox="181 197 427 229">Cultural heritage</p> <p data-bbox="181 236 707 488">Stone flakes and a core stone have been identified in the reserve. Anecdotal evidence suggests that there may be more unrecorded sites within the reserve. Little is known about traditional Aboriginal use and values.</p> <p data-bbox="181 531 707 639">Little is known about the European history of the reserve other than that it was a state forest.</p> <p data-bbox="181 683 725 858">There are two historic sites known in the reserve, the ruins of a small slab hut on the north-western boundary and the wagon track in the north-west corner.</p>	<ul data-bbox="741 240 1160 349" style="list-style-type: none"> • Cultural heritage values of the reserve are identified and protected. 	<ul data-bbox="1173 240 1933 759" style="list-style-type: none"> • Consult the local Aboriginal community, traditional groups and the Armidale Local Aboriginal Land Council about Aboriginal sites, places and other values in the reserve. • Precede all ground disturbance work with a check for cultural features. • Involve the local Aboriginal community in any works affecting Aboriginal sites and in any interpretation of Aboriginal values. • Encourage research into the cultural heritage values of the reserve. In particular, encourage research into the cultural significance of the slab hut and wagon track and record the sites as appropriate. 	<p data-bbox="1951 236 2018 268">High</p> <p data-bbox="1951 421 2069 453">Medium</p> <p data-bbox="1951 496 2069 528">Medium</p> <p data-bbox="1951 603 2018 635">Low</p>

Current situation	Desired outcomes	Strategies	Priority
<p>Visitor use</p> <p>There is no public access to the reserve and, as a consequence, general visitor use is low. No facilities exist within the reserve.</p> <p>Other areas of NPWS estate nearby provide visitor facilities and recreation opportunities.</p> <p>The reserve has a history of public uses, many of which are no longer appropriate within a nature reserve.</p> <p>Use of the reserve must be carefully managed as it is a relatively small and significant area of remnant vegetation.</p>	<ul style="list-style-type: none"> • The local community is aware of the values of the reserve and of management programs. • Visitor use remains low and is self-reliant and ecologically sustainable. 	<ul style="list-style-type: none"> • Orienteering will be phased out in the reserve by 30 June 2007. • Military training exercises will not be permitted in the reserve. • Promote community understanding and appreciation of the conservation values of the reserve through contact with neighbours, community organisations and media releases, NPWS <i>Discovery</i> programs and interpretive material as necessary. • Permit use of the reserve (with prior neighbour approval for access) for passive appreciation and recreation activities (walking, bird watching and nature study). Recreation activities which do not comply with passive recreation (as outlined above) will not be permitted. • Public vehicle use (including trail bikes), cycling, horse riding, and camping will not be permitted in the reserve. 	<p>High</p> <p>High</p> <p>Medium</p> <p>Medium</p> <p>Medium</p>

Current situation	Desired outcomes	Strategies	Priority
<p>Research</p> <p>A student from the UNE is undertaking research into the effects of fire on vegetation in the reserve.</p> <p>Due to the reserve's proximity to Mt Duval and forested areas such as Devils Pinch, it is possible that it is regionally significant for koalas.</p> <p>Research will improve understanding of the natural and cultural heritage values of the reserve, threatening processes and the requirements for management of significant plant and animal assemblages and species.</p>	<ul style="list-style-type: none"> • Research conducted assists management of the reserve and has minimal impact. 	<ul style="list-style-type: none"> • Encourage research to improve knowledge and management of natural and cultural heritage in the reserve. • Encourage research into the relative significance of the reserve for koalas. • Liaise with the UNE and other tertiary education providers about priorities for research in the reserve. 	<p>High</p> <p>Medium</p> <p>Medium</p>

Current situation	Desired outcomes	Strategies	Priority
Management operations			
The only access to the park is through adjacent private lands. Arrangements with neighbours for access have not been formalised.	<ul style="list-style-type: none"> Management facilities adequately serve management needs and have acceptable impact. 	<ul style="list-style-type: none"> Agreement to be negotiated with relevant neighbour(s) to ensure long-term access to the reserve is available to NPWS for management purposes. 	High
The management trails in the park have been assessed as necessary for management purposes.	<ul style="list-style-type: none"> NPWS has long term access to the reserve. 	<ul style="list-style-type: none"> In conjunction with neighbours, maintain fences and determine strategies to exclude stock in areas where construction of boundary fences is difficult. 	High
Fencing along the park boundary is inadequate in some places to exclude stock.	<ul style="list-style-type: none"> Maintenance of electricity transmission line has minimal impact on reserve. 	<ul style="list-style-type: none"> Only authorised vehicles will be permitted to access the reserve. Any vehicles accessing the reserve must remain on the management trails, unless otherwise authorised for management or emergency activities. 	High
Access to the reserve is required by the electricity provider for routine maintenance on electricity transmission lines. A formal management agreement has been reached and conditions are in place to ensure the reserve's values are not diminished.		<ul style="list-style-type: none"> Negotiate agreement(s) with relevant neighbour(s) to ensure floodgates are regularly inspected and maintained. 	Medium
Floodgates exist across Booroolong Creek at the northern end of the reserve.		<ul style="list-style-type: none"> Liaise with neighbours to detect illegal activities. Liaise with the electricity provider to ensure compliance with conditions of agreement. Maintain management trails within the reserve as shown in figure 1. All other trails not shown on figure 1 will be closed and where necessary rehabilitated. 	Medium
			High
			Low

Legend for priorities:

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

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

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

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