

WATSONS CREEK NATURE RESERVE
PLAN OF MANAGEMENT

NSW National Parks and Wildlife Service

Part of the Department of Environment and Conservation (NSW)

February, 2005

This plan of management was adopted by the Minister for the Environment on 1st February 2005.

Inquiries

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

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FOREWORD

Watsons Creek Nature Reserve is located on the western fall of the New England Plateau approximately 32 km north-north-east of Tamworth and 65 km south-west of Armidale. The reserve is approximately 1260 ha in size and is in two portions, separated by an area under mining lease with known mineral deposits which has been subject to mining activities.

Watsons Creek Nature Reserve lies on the Moonbi range, a southern arm of the Nandewar range. It lies within a significant region of overlap between the New England Tablelands and Western Slopes vegetation communities and species. Over 329 flora species have been recorded in the reserve.

The *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 the area will be managed in the years ahead.

A draft plan of management for Watsons Creek Nature Reserve was placed on public exhibition from 4 October 2002 until 3 February 2003. The exhibition of the plan of management attracted 7 submissions that raised 7 issues. All submissions received were carefully considered before adopting this plan of management.

The primary emphasis of this plan is the conservation of the natural, cultural and scenic values of Watsons Creek Nature Reserve. Research into the Aboriginal and historic heritage of the reserve will be encouraged. The reserve will continue to be available for passive appreciation and recreation activities such as walking, bird watching and nature study.

This plan of management establishes the scheme of operations for Watsons Creek 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 policies of the National Parks and Wildlife Service. The policies arise 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 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 *NSW Environmental Planning and Assessment Act 1979* requires the assessment and mitigation of environmental impacts of any works proposed in this plan.

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 (Section 30J).

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

2. WATSONS CREEK NATURE RESERVE

2.1 LOCATION, GAZETTAL AND REGIONAL SETTING

Watsons Creek Nature Reserve (referred to herein as ‘the reserve’) is located on the western fall of the New England Plateau approximately 32 km north-north-east of Tamworth and 65 km south-west of Armidale. The reserve is approximately 1260 ha in size and was Crown land prior to gazettal in 1980. The reserve has two portions, separated by an area under mining lease with known mineral deposits which has been subject to mining activities. The location of the reserve, nearby areas of NPWS estate and towns are shown in figure 1.

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

This plan applies to both the land currently reserved as Watson’s Creek 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. The reserve and surrounding lands were extensively logged. Great amounts of the timber was used in the mining industry for nearby dams, shafts, tunnels and road works.

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 lies on the Moonbi range, a southern arm of the Nandewar range. The reserve has undulating topography with some steep slopes in the west of the reserve. Elevation ranges from 660m to 1130m above sea level. Drainage flows west into Spring

Creek, Giants Den Creek and Oak Creek. These creeks eventually drain into the Namoi River, a sub catchment of the Murray-Darling Basin.

The reserve lies within rocks of the Bundarra Plutonic Suite, and Early Permian belt of S-type granites. These form a continuous belt from Bendemeer in the south, north to the Queensland border. The granites are characteristically coarse grained, and in the region of the reserve have been mapped into two subtly different units – the Pringles Monzogranite in the north and the Glenclair Monzogranite in the south. Weathering and erosion have exposed granite bedrock sheets and tors throughout the area. Undifferentiated units of the Bundarra Plutonic Suite are contained in nearby Ironbark and Stony Batter Creek Nature Reserves and Warrabah National Park. A small amount of Devonian to Carboniferous metasediment occurs in the far southwest of the reserve. This metasediment has been intruded and metamorphosed by the younger Bundarra Plutonic Suite.

Soils within the reserve are influenced by the underlying geology and topography. Coarse granite based soils such as yellow-grey podzolics are found throughout the reserve, with patches of alluvium-colluvium along larger drainage lines.

Native Flora

The reserve is an important remnant area of vegetation indicative of vegetation communities that covered much of the north-western slopes of the New England Tablelands prior to clearing for grazing and other activities. Connectivity with nearby remnant vegetation associations is limited. Whilst the Moonbi Ranges contain some areas of woodland that are contiguous with the reserve, the majority of the surrounding landscape is cleared or partly cleared grazing land.

The reserve lies within the New England Tablelands bioregion and is in close proximity to the Nandewar bioregion. The reserve lies within a significant region of overlap between Tablelands and western slopes vegetation communities and species.

Over 329 flora species have been recorded in the reserve (Copeland, 2002). The reserve is primarily covered by dry sclerophyll forest and woodland communities dominated by red stringybark (*Eucalyptus macrorhyncha*), Youman's stringybark (*E. youmanii*), New England blackbutt (*E. andrewsii*), mountain gum (*E. dalrympleana* subsp. *heptantha*), orange gum (*E. prava*) and Caley's ironbark (*E. caleyi* subsp. *Caleyi*). Small pockets of riparian vegetation occur along the creeklines and patches of heath are found on top of the larger rocky outcrops.

The open forest and woodland communities support a well developed shrub layer dominated by Geebung (*Persoonia fastigata*), sticky hopbush (*Dodonaea viscosa* subsp. *augustifolia*), Daphne heath (*Brachyloma daphnoides*), cycads (*Macrozamia* sp.) and various wattles (*Acacia* spp.). The ground layer is dominated by curly sedge (*Caustis flexuosa*), forest goodenia (*Goodenia hederacea*) and tussock grass (*Poa sieberiana*). Native orchids are well represented with 20 species recorded to date.

Small pockets of swamp and riparian vegetation occur along the creeklines in poorly drained soils on higher elevations. These communities are dominated by small-fruited hakea (*Hakea microcarpa*), common tea-tree (*Leptospermum polygalifolium*) and a number of sedges and grasses (NPWS, 2000).

The steeper rocky areas of the western side of the reserve support a woodland community of Caley's ironbark, tumbledown gum (*E. dealbata*) and orange gum. Scattered black cypress pine (*Callitris endlicheri*) and kurrajong (*Brachychiton populneus*) are also found in this community.

The exposed rocky outcrops contain areas of low heath. Shrubs such as blunt beard-heath (*Leucopogon muticus*) are dominant here. Based on surveys of similar granite outcrops in the region, rare or endemic species may also be found in these vegetation communities.

Surveys in the reserve have identified five rare or threatened Australian plant (ROTAP) species: Youman's stringybark, Moonbi apple box (*E. malacoxylon*), and greenhood orchid (*Pterostylis woollsii*). Prickly bottlebrush (*Callistemon pungens*) has been observed as a single individual in the south-eastern side of the reserve and Quinn's mallee (*Eucalyptus quinniorum*) is known from a single population in the central western side of the reserve. Three further ROTAP species have been recorded close to the boundary and may occur within the reserve (Copeland, 1998).

Native Fauna

The reserve has not been surveyed for fauna for nearly 20 years. Students of the University of New England (UNE) conducted a basic fauna survey in 1983 in the reserve. This survey and additional incidental observations have identified 5 native mammal, 51 bird and 2 reptile species within the reserve (NPWS, 2000). A further 7 native mammal, 2 bird, 13 reptile and 6 frog species have been recorded within 1 km of the reserve. These records include the common bent-wing bat (*Miniopterus schreibersii*) and eastern cave bat (*Vespadelus troughtoni*), both listed as vulnerable under the TSC Act. It is likely that these species will also be found within the reserve upon further survey.

Aboriginal Heritage

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 the territory of the Gamilaroi people. The Gamilaroi are associated with land west from the Great Dividing Range roughly between Murrurundi and the Queensland border (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).

Artefacts have been located across the region. There is substantial evidence of Aboriginal occupation in close proximity to the reserve including seven recorded

shelters with art or deposit sites, a scarred tree and a rock engraving within 7 km of the reserve. There has been no study or research to determine the Aboriginal heritage values of the reserve.

The reserve falls within the area of the Tamworth Local Aboriginal Land Council.

History since European Occupation

The first European to visit the New England region in 1818 was John Oxley. European squatters began to occupy land soon afterwards, which included the area in the vicinity of the reserve.

The area around the reserve is known to be rich in tin oxide (cassiterite) deposits. There is substantial evidence of past mining activities scattered adjacent to the reserve, including slit trenches (adits), dams, mullock heaps, shafts, old machinery and other equipment noted (NPWS, 1996). Most of these features are also represented on the land surrounding the reserve.

Some minor logging activities have occurred within the reserve prior to gazettal, mainly for local fencing and domestic purposes. Grazing has also occurred over much of the reserve between 1959 and 1980 through permissive occupancy grazing permits issued under former tenures.

2.4 RESEARCH AND EDUCATION

Whilst there are no current research activities in the reserve, the reserve provides research opportunities for local tertiary institutions. Research can provide information to assist reserve management by the NPWS.

2.5 VISITOR USE

Visitor use of the reserve is low due to its isolation and limited public access. There are no visitor facilities within the reserve. There is no access maintained by NPWS to the northern section of the reserve. A rough trail does exist which ends close to the northern section of the reserve. This trail passes through leased crown land. The southern section of the reserve can be accessed by a public road, Den Mountain Road (see figure 1). Reserve identification and regulatory signs are located at the northern management trail entrance.

Some illegal hunting occurs sporadically, mainly for goats (*Capra hircus*) and pigs (*Sus scrofa*).

Day use and camping areas are located nearby in Warrabah National Park, 25 km by road from the reserve, in addition to Oxley Wild Rivers National Park at Dangars Falls and Gara Gorge, within 110 km of the reserve.

2.6 THREATS TO RESERVE VALUES

Introduced Plants

Blackberry (*Rubus fruticosus*), sweet briar (*Rosa rubiginosa*) and prickly pear (*Opuntia spp*) have been found within the reserve. Sweet briar and prickly pear appear in small, isolated occurrences. Annual control programs have decreased the distribution and occurrence of these species.

Introduced Animals

Pigs (*Sus scrofa*), foxes (*Vulpes vulpes*) and goats (*Capra hircus*) have been recorded in the reserve. Other vertebrate pests such as feral cats (*Felis catus*) and rabbits (*Oryctolagus cuniculus*) may occur within the reserve. These species can have significant effects on the natural and cultural heritage values of the reserve.

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.

There have been two fires recorded within the reserve since 1980. A fire burned most of the northern section of the reserve in 1980, and a low intensity fire caused by lightning strikes burned 150 ha of the southern section of the reserve in 1997. The fire history of the reserve prior to gazettal is unknown, however, anecdotal information suggests that the only other fire in or near to the reserve occurred in about 1957.

A recent review of fire management throughout the NPWS has resulted in a modified approach to fire planning based on the level of complexity involved. In regard to Watsons Creek Nature Reserve, the NPWS considers that the reserve requires that separate map based fire management strategies be prepared for the reserve. Annual hazard reduction programs will also be submitted to the district Bush Fire Management Committee.

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. Although connectivity is limited, nearby vegetated areas consolidate the habitat values of the reserve and provide ecological corridors to other surrounding forested areas.

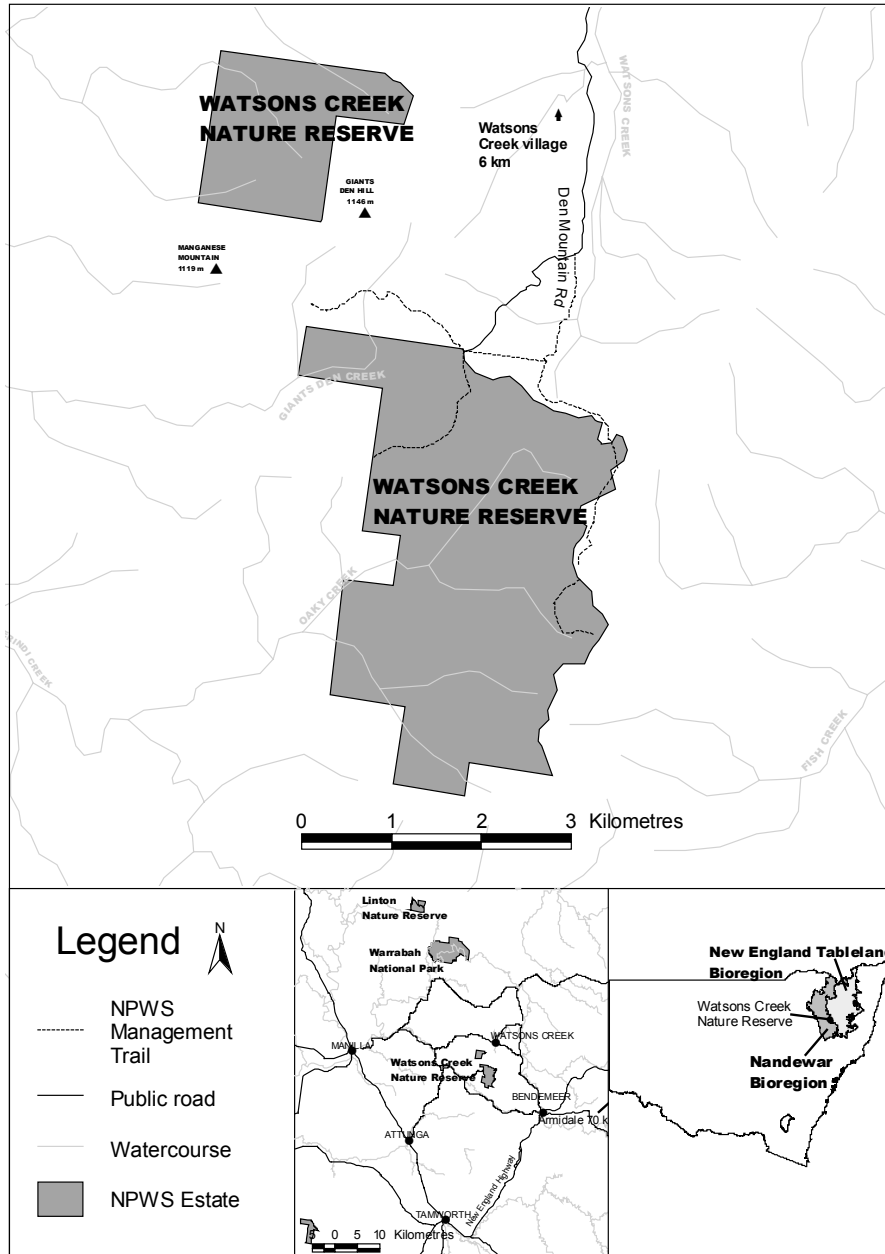


Figure 1: Watsons Creek Nature Reserve Management Infrastructure & Regional Context

3. MANAGEMENT ISSUES AND STRATEGIES

| Status | Desired Outcomes | Strategies | Priority |
|--|---|--|----------|
| Soil and water conservation | | | |
| Soils in the reserve are easily eroded when disturbed. | <ul style="list-style-type: none"> • Soil erosion is minimised. • Pollution sources are identified and controlled, both on and off park (in the vicinity of the reserve). | <ul style="list-style-type: none"> • Management trails will be maintained to appropriate standards (refer to <i>Management Operations</i> below). • 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. • Assess if pollution from mining tailings is adversely affecting soil and water quality within the reserve. • Implement pollution control and rehabilitation measures as necessary in liaison with the Department of Mineral Resources (DMR), Environment Protection Authority (EPA) and other relevant agencies. | High |
| Management trails are specific areas where soil erosion can be a problem. | | | High |
| There are areas of gully erosion along Giants Den Creek. | | | Medium |
| Past mining activities have degraded some areas of the reserve. | | | Low |
| Heavy metals from mining tailings (only some of which exist on the reserve) may be polluting Giants Den Creek catchment. | | | Low |

| Status | Desired Outcomes | Strategies | Priority |
|--|--|--|--|
| Native plant and animal conservation | | | |
| <p>There is limited knowledge about the reserve's rare or threatened species.</p> <p>The reserve is one of a 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 reduce habitat value and are likely to increase the potential for weed prevalence.</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. Encourage surveys for rare or threatened plant and animal species. Where relevant to the reserve, implement strategies outlined in recovery plans in accordance with the Threatened Species Conservation Act. Rehabilitate cleared areas by monitoring and controlling weeds, encouraging natural regeneration and, where necessary, supplement with native plantings. | <p>High</p> <p>High</p> <p>Medium</p> <p>Medium</p> <p>Low</p> |

| Status | Desired Outcomes | Strategies | Priority |
|---|--|---|--|
| <p>Introduced species</p> <p>Three weed species have been identified in the reserve but are not widespread. These are blackberry, sweet briar and prickly pear, which are subject to ongoing control programs in accordance with the draft Northern Tablelands Region 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, goats and pigs occur in the reserve. Hares, cats and rabbits may also occur within 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 Tamworth 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> |

| Status | Desired Outcomes | Strategies | Priority |
|---|---|--|---|
| Fire management | | | |
| <p>Fire management strategies are 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>Fires have occurred within separate areas of the reserve during 1980 and 1997. The fire history of the reserve prior to 1980 is unknown.</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 fire management strategies 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. • As far as possible, a fire free interval of at least 10 to 15 years will be maintained in all dry sclerophyll forest types within the reserve. • Prohibit camp fires and other open fires to remove potential ignition sources for fires (refer to <i>Visitor Use</i> below). • 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 strategies. • Prepare agreements with neighbours for access to water sources during fire emergencies. | <p>High</p> <p>High</p> <p>High</p> <p>High</p> <p>High</p> <p>Medium</p> <p>Medium</p> <p>Medium</p> |

| Status | Desired Outcomes | Strategies | Priority |
|---|---|---|---|
| <p>Cultural heritage</p> <p>Although substantial evidence of Aboriginal occupation has been found in close proximity to the reserve, no sites are known in the reserve and little is known about traditional Aboriginal use and values.</p> <p>Little is known about the European history of the reserve other than that it was Crown land and generally used for grazing purposes.</p> <p>The significance of mining relics on land adjacent to the reserve is unknown.</p> | <ul style="list-style-type: none"> • Cultural heritage values of the reserve are identified and protected. | <ul style="list-style-type: none"> • Consult the local Aboriginal community, traditional groups and the Tamworth 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 and immediate adjoining areas. • Encourage research into the historic significance of the mining relics on the land adjacent to the reserve. | <p>High</p> <p>Medium</p> <p>Medium</p> <p>Low</p> <p>Low</p> |

| Status | Desired Outcomes | Strategies | Priority |
|--|---|--|----------|
| Visitor use | | | |
| The reserve receives low levels of visitation, mainly for walking, bird watching and nature study. | <ul style="list-style-type: none"> • The local community is aware of the values of the reserve and of management programs. | <ul style="list-style-type: none"> • 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. | High |
| Public access to the southern section of the reserve is possible from a public road, Watsons Creek Road. There is no public access to the northern section of the reserve. | <ul style="list-style-type: none"> • Visitor use remains low and is self-reliant and ecologically sustainable. | <ul style="list-style-type: none"> • Permit use of the reserve 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. | Medium |
| No facilities exist within the reserve. Other areas of NPWS estate nearby provide visitor facilities and recreation opportunities. | <ul style="list-style-type: none"> • Illegal shooting activities cease to occur. | <ul style="list-style-type: none"> • Public vehicle use (including trail bikes), cycling, horse riding and camping will not be permitted in the reserve. | Medium |
| There is anecdotal evidence of illegal shooting within the reserve. | | <ul style="list-style-type: none"> • Provide signage at access points to the reserve detailing appropriate uses of nature reserves. | Medium |
| Use of the reserve must be carefully managed, as it is a significant area of remnant vegetation. | | <ul style="list-style-type: none"> • Liaise with neighbours to detect illegal activities. | Medium |
| | | <ul style="list-style-type: none"> • Monitor levels and impacts of visitor use. | Medium |

| Current Situation | Desired Outcomes | Strategies | Priority |
|--|--|--|--|
| <p>Management operations</p> <p>The management trails in the reserve have been assessed as necessary for management purposes.</p> <p>Fencing along the reserve boundary is inadequate in some places to exclude stock.</p> <p>There is substantial evidence of past mining activities scattered throughout land adjacent to the reserve (between the northern and southern sections), including slit trenches, dams, mullock heaps, shafts, old machinery and other equipment noted.</p> <p>There is no access maintained by NPWS to the northern section of the reserve. A rough track does exist which ends close to the northern section of the reserve. This track traverses previously mined land which has a number of shafts and trenches which are hidden and have not been rehabilitated.</p> | <ul style="list-style-type: none"> • Management facilities adequately serve management needs and have acceptable impact. • NPWS has long term access to both sections of the reserve. • Domestic animals do not enter the reserve. • Previously mined areas have been assessed for risk and managed accordingly. | <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. • 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. • 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. • Negotiate public access agreements with neighbours to allow access to the reserve. • Investigate and if possible develop access for management purposes (other than traversing the mining leases between the two sections of the reserve) to the northern section of the reserve subject to agreement from relevant neighbours. • Liaise with DMR to undertake a safety assessment of the mined area adjacent to the reserve, and consistent with the heritage values, identify rehabilitation and other options aimed at minimising risk. (refer to <i>Cultural Heritage</i> above) | <p>High</p> <p>Medium</p> <p>Medium</p> <p>Medium</p> <p>Low</p> |

| Status | Desired Outcomes | Strategies | Priority |
|--|---|--|----------------|
| Research | | | |
| 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. | <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. Liaise with the UNE and other tertiary education providers about priorities for research in the reserve. | High Medium |

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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