

BOONANGHI NATURE RESERVE

PLAN OF MANAGEMENT

NSW National Parks and Wildlife Service

December 2003

This plan of management was adopted by the Minister for the Environment on 8th December 2003.

Acknowledgments

This plan of management was prepared by NPWS Macleay Area staff, NPWS Mid-North Coast Regional staff and the NPWS Northern Directorate Planning Group.

Further information

For additional information or enquiries on any aspect of the plan, contact the NPWS Mid North Coast Regional Office at 152 Horton Street, Port Macquarie or by phone on (02) 6586-8300.

NSW National Parks and Wildlife Service

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FOREWORD

Boonanghi Nature Reserve is located on the Mid North Coast of NSW, 18 km west-north-west of Kempsey, on the southern side of the Macleay River. It is part of a major north-west running spur of Cooperabung Range.

Twenty significant plant species have been recorded in the reserve, two of which are listed as endangered or vulnerable under the *Threatened Species Conservation Act 1995*. The significant species are generally very sparsely distributed throughout the reserve. There has been no comprehensive fauna survey carried out to date, however five species listed as vulnerable under the *Threatened Species Conservation Act* are known to occur within the reserve.

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 Boonanghi Nature Reserve was placed on public exhibition for three months from 4th October 2002 until 3rd February 2003. The exhibition of the plan of management attracted 4 submissions which raised 7 issues. All submissions received were carefully considered before adopting this plan of management.

This plan of management provides for on-going consultation with the Dunghutti elders and the Kempsey Local Aboriginal Land Council in all aspects of management of Aboriginal sites, places and values. It also provides for the control, and where possible eradication, of introduced pest plant and animal species found in the reserve, preparation of a fire management strategy and gating of certain trails.

This plan of management establishes the scheme of operations for Boonanghi 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 NSW is in the context of the legislative and policy framework, primarily the *National Parks and Wildlife Act 1974* (NPW Act), the NPW Land Management Regulation, the *Threatened Species Conservation Act 1995* (TSC Act) and the policies of the National Parks and Wildlife Service (NPWS). Section 72AA of the NPW Act lists the matters to be considered in the preparation of a plan of management. The policies arise from the legislative background and internationally accepted principles of park management. They relate to nature conservation, Aboriginal and historic heritage conservation, recreation, commercial use, research and communication.

Other legislation, international agreements and charters may also apply to management of the area. In particular, the *Environmental Planning and Assessment Act 1979* (EPA Act) requires the assessment and mitigation of the environmental impacts of any works proposed in this plan.

A plan of management is a statutory document under the NPW Act. Once the Minister has adopted this plan, no operations may be undertaken within Boonanghi 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. BOONANGHI NATURE RESERVE—BASIS FOR MANAGEMENT

2.1 LOCATION, GAZETTAL AND REGIONAL SETTING

Boonanghi Nature Reserve (hereafter called “the reserve”) is located on the Mid North Coast of NSW, 18 km west-north-west of Kempsey, on the southern side of the Macleay River. It is part of a major north-west running spur of Cooperabung Range, with a low saddle at the head of Dungay and Toorumbie creeks. The reserve was originally composed of former vacant crown land on the northern fall of Boonanghi Range. It was gazetted on 5 March 1999, with later additions on 17 December 1999. On 1 January 2003 two sections of Boonanghi State Forest, with a combined area of 688 ha, were added to the reserve on the southern fall of Boonanghi Range, to form a total area of 4441 ha.

The reserve is connected to Willi Willi National Park in the west, while Boonanghi State Forest connects the reserve to Kumbatine National Park and Willi Willi National Park in the south. These national parks are also joined by Yessabah and Kippara State Forests. It is important that this link between the NPWS estate is maintained to retain the maximum conservation value of the reserve. Lands to the north are freehold, as are lands in Dungay Creek to the south-east and south-west beyond Boonanghi State Forest. These private lands conduct predominantly pastoral activities.

The reserve has a high biogeographical importance as it lies on the lower slopes of the Cooperabung Range, contributing to a wildlife corridor from the lower Macleay River floodplain to the New England tableland.

The name Boonanghi was derived from the adjoining Boonanghi State Forest. Boonanghi State Forest was named for the Parish of Boonanghi, which in turn was named after Major Kemp’s “Boonanghi” homestead, an early land holding in upper Dungay Creek. It is said that this word is from the local Aboriginal language and means “place of wild cattle”. Parts of reserve were lightly logged for poles in the 1980’s. This logging was restricted to areas accessible from Boonanghi Trail and Kullatine Roads.

The reserve is wholly within the Kempsey Local Government Area, the Kempsey Local Aboriginal Land Council area, the Dughutti tribal area, the Mid North Coast Catchment Management Board area and the Kempsey Rural Lands Protection Board area.

2.2 LANDSCAPE

Natural and cultural heritage and on-going use are strongly inter-related and together form the landscape of an area. Much of the Australian environment has been influenced by past Aboriginal and non-Aboriginal land use practices, and the activities of modern day Australians continue to influence bushland through recreational use, cultural practices, the presence of introduced plants and animals and in some cases air and water pollution.

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

Elevation ranges from 120 m to 654 m above sea level over a distance of 2-3km, resulting in extremely steep slopes to the north and south of the major east-west ridge line.

The soil in the reserve is derived from Carboniferous lithic sandstone and mudstone (Northcott 1973). Both colluvial and erosional soil landscapes have been identified in the reserve (Atkinson 1999) as shown in Table 1.

Table 1 Soil types and their erosion potential

Soil Material	Landscape	Erosion risk
Kogo	Colluvial	Extreme
Five Ways	Erosional	High
Gearys Mountain	Erosional	Moderate

The Kogo and Five Ways landscapes dominate the reserve, with Gearys mountain landscape being limited to creek lines in Stony Creek and Temagog Creeks. These three soil materials are typically shallow, stony, infertile and easily eroded by water.

Catchment values

The water leaving the northern fall of the reserve does so by Stony, Temagog, Lovelocks and Parrabel Creeks which form tributaries to the Macleay River. Adjoining and downstream landholders utilise these streams for stock watering. The Macleay River provides the domestic water supply for the town of Kempsey.

The smaller southern fall of the reserve drains to Dungay Creek, which enters the Macleay River. Dungay Creek is utilised to water stock in the Dungay Creek, Wittitrin and Dongdingalong pastoral lands.

Native Plants

Twenty significant plant species have been recorded in the reserve by Kendall and Kendall (2000) (Table 2). Two of these are listed as endangered or vulnerable under the TSC Act. The significant species are generally very sparsely distributed throughout the reserve. The survey also identified six major vegetation associations within the reserve:

River oak riparian dry sclerophyll forest (RO)

Confined to the river flats of Parrabel Creek. This community is very restricted in occurrence within the reserve. The upper strata contains river oak (*Casuarina cunninghamiana*), thin-leaved stringybark (*E. eugenioides*) and forest red gum (*E. tereticornis*). This association is currently well below the NSW conservation target.

Rainforest/brush box wet sclerophyll forest (RBBX)

Rainforest/Wet Sclerophyll Forest dominated by a sub-tropical rainforest upper or mid strata and with emergent brush box (*Lophostemon confertus*) and any of the following species: turpentine (*Syncarpia glomulifera*), flooded gum (*Eucalyptus grandis*), white mahogany (*E. acmenoides*), grey ironbark (*E. siderophloia*), tallowwood (*E. microcorys*) and pink bloodwood (*Corymbia intermedia*). The mid-strata is dominated by a range of rainforest species.

Dry rainforest (DRF)

Dominated by giant stinger (*Dendrocnide excelsa*) and shatterwood (*Backhousia sciadophora*). This association is currently well below the NSW conservation target.

Very dry sclerophyll forest on steep rocky slopes (VDSF)

Very Dry Sclerophyll Forest is dominated by narrow-leaved ironbark (*Eucalyptus crebra*), thick-leaved mahogany (*E. carnea*), forest red gum (*E. tereticornis*) and spotted gum (*Corymbia maculata*) with a grassy understorey. The amount of this association reserved is currently well below the NSW conservation target.

Moist brush box dominated sclerophyll forest (MBBX)

Moist open forest dominated by brush box (*Lophostemon confertus*), turpentine (*Syncarpia glomulifera*), tallowwood (*E. microcorys*), and grey ironbark (*E. siderophloia*). The lower strata contains herbs, ferns and grasses.

Grassy open dry sclerophyll forest (GDSF)

Dominated by a variety of upper strata species including pink bloodwood (*Corymbis intermedia*), spotted gum (*C. maculata*), thick-leaved mahogany (*E. carnea*), tallowwood (*E. microcorys*) and grey gum (*E. propinqua*). A mid strata of forest oak (*Allocasuarina torulosa*) is often dense.

Table 2 Significant plants recorded within the reserve

Common name	Scientific name	Status under TSC Act or other significance	Community
square raspwort	<i>Haloragis exaltata</i>	Vulnerable ⁺ *	RO
milk vine	<i>Marsdenia longiloba</i>	Regionally significant	RBBX
orangebark	<i>Maytenus bilocularis</i>	Near southern limit	RBBX
			MBBX
			GDSF
green tamarind	<i>Elattostachys nervosa</i>	Near southern limit	RBBX
sedge	<i>Cyperus laevis</i>	Near southern limit	DRF
			MBBX
			GDSF
tussock	<i>Carex brunnea</i>		DRF

cliff bottlebrush	<i>Callistemon comboynensis</i>	Near southern limit	VDSF
climbing herb	<i>Galactia species A</i>	Near southern limit	VDSF
climbing herb	<i>Galactia species B</i>	Near southern limit	VDSF
grevillea	<i>Grevillia guthrieana</i>	Endangered ^{^#}	VDSF
narrow-leaved geebung	<i>Persoonia linearis</i>	Near northern limit	VDSF
shrub	<i>Pomaderris ferruginea</i>	Near northern limit	MBBX
annual herb	<i>Vittadinia hispidula var hispidula</i>	Uncommon in the area	GDSF
shrub	<i>Desmodium gangeticum</i>	Near southern limit	VDSF
shrub	<i>Solanum denevestitum</i>	Near southern limit	MBBX,
Nambucca ironbark	<i>Glycine cyrtoloba</i>	Near southern limit	GDSF
olive (tree)	<i>Eucalyptus fusiformis</i>	Regional importance	GDSF
cotton firewood	<i>Olea phlogopappa</i>	Near northern limit	GDSF
stinging vine	<i>Senecio quadridentatus</i>	Regionally significant	GDSF
	<i>Tragia novae-hollandiae</i>	Near southern limit	GDSF

[^] Listed on Schedule 1 of the Threatened Species Act 1995

^{*} Listed on Schedule 2 of the Threatened Species Act 1995

[#] also listed as endangered under the *Environment Protection and Biodiversity Conservation Act 1999*

⁺ also listed as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*

The reserve was also modelled during the comprehensive regional assessment (CRA) process as potentially containing other significant plant species (Table 3).

Table 3 Significant plant species predicted to occur within the reserve

Common name	Scientific name	Status under TSC Act or other significance
boronia	<i>Boronia chartacea</i>	ROTAP
acomis	<i>Acomis acoma</i>	ROTAP
—	<i>Cynanchum elegans</i>	Endangered ^{^#}
—	<i>Eriostemon difformis ssp smithianus</i>	Regionally significant
—	<i>Sarcochilus fitzgeraldii</i>	Vulnerable ⁺⁺
silkpod	<i>Parsonsia dorrigoensis</i>	Vulnerable ⁺⁺

[^] Listed on Schedule 1 of the Threatened Species Act 1995

^{*} Listed on Schedule 2 of the Threatened Species Act 1995

[#] also listed as endangered under the *Environment Protection and Biodiversity Conservation Act 1999*

⁺ also listed as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*

ROTAP Listed as a Rare or Threatened Australian Plant (Briggs and Leigh 1995)

Native Animals

There has been no comprehensive fauna survey carried out to date, however five species listed as vulnerable under the TSC Act are known to occur within the reserve (Table 4).

Table 4 Significant animals known to occur in the reserve

Common name	Scientific name	Status under TSC Act
Mammals		
yellow-bellied glider	<i>Petaurus australis</i>	Vulnerable ^r
spotted-tailed quoll	<i>Dasyurus maculatus</i>	Vulnerable ^r
little bent-wing bat	<i>Miniopterus australis</i>	Vulnerable
Birds		
sooty owl	<i>Tyto tenebricosa</i>	Vulnerable
glossy black cockatoo	<i>Calyptorhynchus lathami</i>	Vulnerable

^r recovery plan in preparation

CRA modelling has predicted that a further seven significant species are likely to occur within the reserve (Table 5).

NPWS is required by the TSC Act to prepare and implement recovery plans for all listed threatened species. These are progressively being prepared and will be used to guide management of threatened species in the area.

The nature reserve forms part of a corridor of protected lands and forested ecosystems from the parks and reserves of the eastern escarpment of the Great Dividing Range to valley floor habitats. The reserve contains a significant area of key regional habitats and is part of a major regional corridor. It also connects the Temagog, Collombatti and Crystal Hill Regional corridors.

Table 5 Significant animals predicted to occur within the reserve

Common name	Scientific name	Status under TSC Act
Mammals		
parma wallaby	<i>Macropus parma</i>	Vulnerable
long-nosed potoroo	<i>Potorous tridactylus</i>	Vulnerable
brush-tailed phascogale	<i>Phascogale tapoatafa</i>	Vulnerable ^r
Birds		
masked owl	<i>Tyto novaehollandiae</i>	Vulnerable ^r
bush stone-curlew	<i>Burhinus grallarius</i>	Endangered [^]
Amphibians		
green-thighed frog	<i>Litoria brevipalmata</i>	Vulnerable
giant barred frog	<i>Mixophyes iteratus</i>	Endangered [#]

^r recovery plan in preparation

[#] also listed as endangered under the *Environment Protection and Biodiversity Conservation Act 1999*

[^] also listed as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*

Aboriginal Heritage

There have been no Aboriginal sites recorded within the reserve. However no systematic studies have been undertaken and Aboriginal heritage includes cultural meaning on a landscape scale. Stone arrangements and camp sites exist in other areas of the Cooperabung Range in which the reserve is located.

The reserve is within the Dunghutti tribal area and Kempsey Local Aboriginal Land Council area.

Non-Aboriginal Heritage

There are no recorded historic places within the nature reserve and no known European historic sites on or near the reserve. The accessible ridge top areas of the reserve were lightly logged in the late 1980's for poles and sawlogs. There is little evidence of this activity remaining.

2.4 THREATS TO THE RESERVE'S VALUES

Introduced plants

Most weed species observed within the reserve (Kendall & Kendall 2000) are considered low risk species and are recorded in low densities, often associated with disturbance such as fire and roads. These species currently represent a minor management problem within the reserve, however there are four species that are of concern.

Giant Parramatta grass (*Sporobolus fertilis*)

This species is a declared noxious plant in the Kempsey Local Government Area and is located along Boonanghi trail, with the most significant concentrations being at either end of the trail. Vehicle movement spreads this species and the present infestations should be controlled to limit its spread.

Camphor laurel (*Cinnamomum camphora*)

This species is recorded in low densities in the Grassy Open Dry Sclerophyll Forest, but may represent a threat to the reserve due to its invasive nature. Monitoring of this species will be required.

Moth vine (*Araujia hortorum*)

This species is considered to be aggressive as it is capable of smothering native vegetation and is easily spread by wind and water. Effective control of this species in the riverine community will require a coordinated effort with adjoining landholders.

Lantana (*Lantana camara*)

Both the pink (not declared noxious) and red (noxious) flowering varieties have been observed in the reserve and these can inhibit the establishment of native species. The damage caused to non-target species may outweigh the benefits of control. Control should be concentrated in areas where lantana is:

- inhibiting the establishment of native species;
- growing in the ecotones of the riparian and rainforest communities;
- spreading from the reserve into neighbouring land;
- encroaching on reserve facilities;
- growing in small isolated infestations;
- of the red flowering variety.

Introduced animals

Introduced animal species within the reserve are of concern because they have the potential to have detrimental effects on ecological values and can spread to neighbouring land. There has been no direct observation of pest animals, their tracks or scats within the reserve. Pest animals known to occur immediately to the north of the reserve include the fox (*Vulpes vulpes*), cat (*Felis catus*) and the rabbit (*Oryctolagus cuniculus*) (RLPB 1998). Predation by foxes on native animals, particularly after fire, is listed as a key threatening process under the TSC Act and is considered a significant problem in the Mid North Coast Region.

The reserve is only partially fenced on the northern boundary adjacent to private property. The remainder of the reserve adjoins vacant crown land or state forest and is unfenced. Maintenance of fencing adjacent to private lands is important to minimise the likelihood of domestic stock entering the reserve.

Fire history

The fire history of reserve is poorly known, although fires were recorded in 1996-98, 2000/2001 and 2001/2002 in the western or Stony trail area. It is known that the entire reserve was burnt in the late 1980's and frequently prior to that time. In June-July 2002 the whole of the northern aspect of the reserve was burnt by a wildfire, which originated off-reserve as an escaped hazard reduction burn near Willi Willi Road. Due to mild temperatures and low windspeed this fire did not burn with any great intensity.

Dry hardwood forests occupy the majority of the reserve on very steep slopes running down to grasslands. Escapes from fires on private property have frequently burned into the reserve, where they are difficult to access and control. Past fire control has been to back burn from Boonanghi trail if a fire threatened to overtop the main ridge and burn into Boonanghi State Forest.

It is likely that reserve has been burned beyond the threshold to maintain biodiversity.

A draft fire management plan will be prepared for the reserve. It will identify the bushfire threat and requirements for community protection measures in areas where it is identified that fire is a threat to property and the conservation of native plants, animals, or any cultural features that may be found within the reserve.

Modification of surrounding lands

Boonanghi State Forest to the south provides a vegetated corridor to Kumbatine and Willi Willi National Parks to the south. Lands to the north and lands around Dungay Creek to the southeast have been cleared, predominantly for pastoral activities.

Non-NPWS use

A first order trigonometric survey marker is located on the Boonanghi Range on the southern boundary between the reserve and Boonanghi State Forest. The Surveyor

General's Department (part of the Department of Land and Water Conservation) requires ongoing access to this site.

Adjacent to Boonanghi trigonometrical site there is a complex of solar-powered radio transmitters used by local government and other public authorities for communications. These sites were on vacant crown land prior to the gazettal of the reserve and were managed by State Forests NSW (SFNSW).

2.5 VISITOR USE

Visitors may reach the reserve via Toorumbree Creek Road and Peach Tree Trail to the west, Boonanghi Trail to the south-west, or by Kullatine Road and Stony Trail off Boonanghi Road to the south-east. There will be no public vehicular access within the reserve, apart from Peach Tree Trail.

The reserve currently receives low levels of use for nature based recreation and there are no recreation facilities in the reserve. Recreational activities not consistent with the study of nature and natural environments are generally considered inappropriate uses of a nature reserve.

Infrequent, limited horse riding by casual riders, as well as non-competitive group rides up to four times per year, have occurred along Peach Tree Trail as part of longer rides, including access to the Bicentennial National Trail.

Opportunities for a range of nature based recreational activities are provided nearby in Kumbatine National Park and Kipparra State Forest.

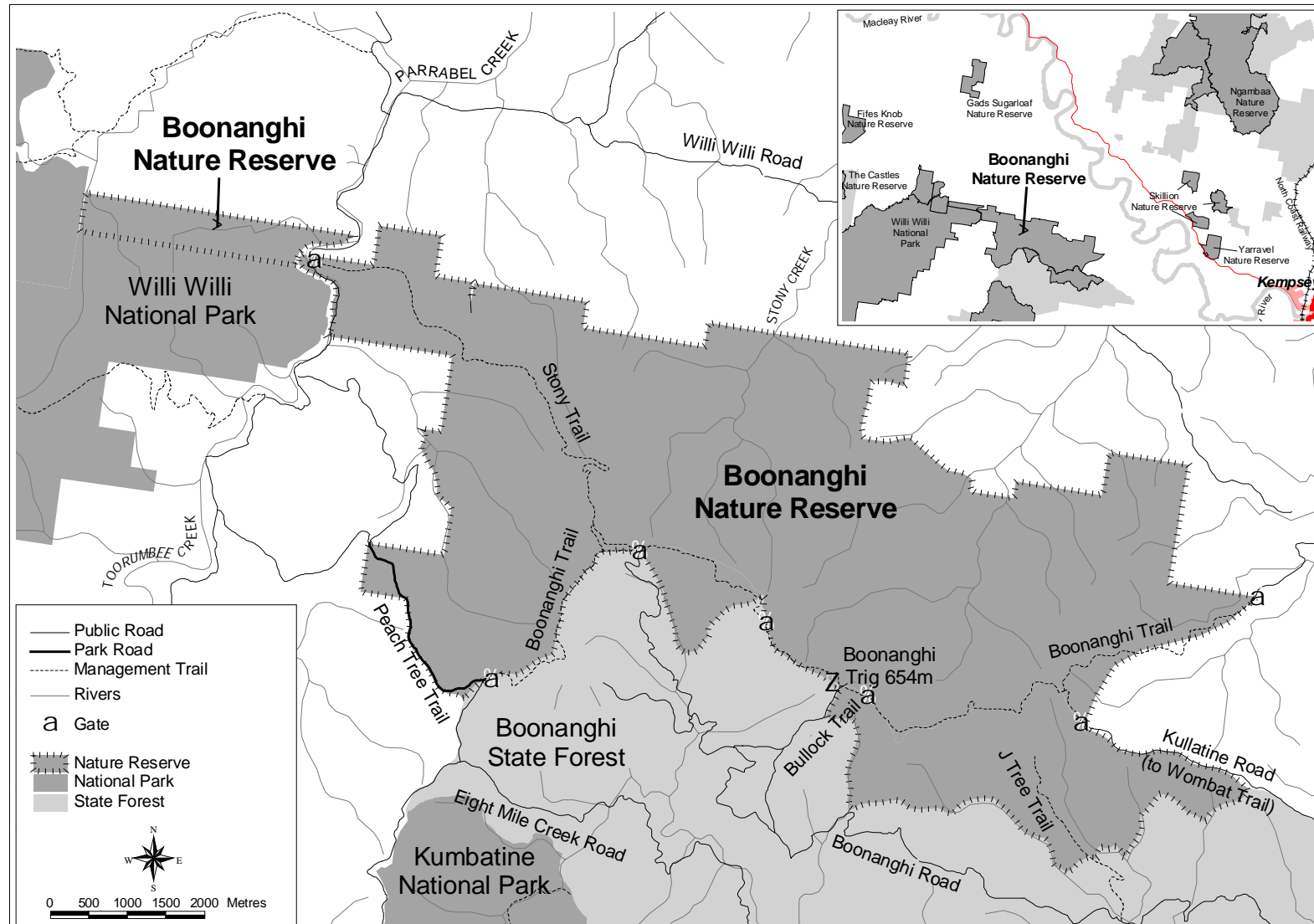
2.6 MANAGEMENT ACCESS

Radio and survey vehicles may access the Boonanghi Trigonometrical and radio tower site via a short section of Boonanghi Trail, reached by Bullock Trail.

To the west, management vehicles may access the reserve from Parrabel Creek via Stony Trail to Boonanghi Trail, or from Toorumbree Creek by Peach Tree Trail and north along Boonanghi Trail. To the north, the reserve may be accessed from Willi Willi Road, through private property with the land owners permission, to Boonanghi Trail. Kullatine Road connects to Boonanghi Road via Wombat Trail to give management access from the east. All the reserve trails are natural surface 4WD dry weather only, as are Kullatine Road, Wombat Trail and Bullock Trail.

The section of the reserve to the west of Toorumbree Creek adjoining the north-eastern boundary of Willi Will National Park has no vehicle access.

3. BOONANGHI NATURE RESERVE AND LOCALITY MAP



4. BOONANGHI NATURE RESERVE — MANAGEMENT ISSUES AND STRATEGIES

Current Situation	Desired Outcomes	Strategies	Priority
<p>Soil and water conservation</p> <p>Although there are currently minimal soil erosion or water quality issues in the reserve, the soils in the reserve are highly erodible if disturbed.</p> <p>The reserve is a steep watershed in a northerly direction from the southern boundary.</p>	<ul style="list-style-type: none"> • There is no evidence of accelerated soil erosion. • There is no reduction in water quality in the reserve's streams. 	<ul style="list-style-type: none"> • Undertake all works, such as trail maintenance and fuel reduction, in a manner that minimises erosion and water pollution. • Liaise with the Mid North Coast Catchment Management Board to ensure water quality is maintained in the reserve's catchment. 	<p>High</p> <p>Medium</p>
<p>Native plant and animal conservation</p> <p>The reserve provides habitat for a number of significant plant and animal species.</p> <p>There has been no formal survey of fauna within the reserve.</p> <p>Ecological viability of the reserve would be improved by the maintenance of vegetation corridors on neighbouring lands. This would assist in the movement of wildlife between the reserve and other forested areas.</p>	<ul style="list-style-type: none"> • There is no loss of native plant and animal species found in the reserve, or reduction in habitat diversity. • Increased knowledge of native plant and animals in the reserve and their ecological requirements. 	<ul style="list-style-type: none"> • Undertake or encourage an appropriate fauna survey and additional appropriate flora surveys, in particular to determine the occurrence of significant species (refer to Research). • Encourage appropriate research into the ecological requirements of significant species in the reserve (refer to Research). • Liaise with neighbours, Landcare groups, vegetation management committees and other land use authorities to encourage retention, and if possible expansion, of areas of native vegetation close to the reserve. 	<p>Medium</p> <p>Medium</p> <p>Medium</p>

Current Situation	Desired Outcomes	Strategies	Priority
<p>Introduced species</p> <p>Giant Parramatta grass is a problem in the radio transmitter area of Boonanghi trigonometrical station.</p> <p>Moth vine is a problem in the Parrabel Creek area.</p> <p>Lantana occurs in limited locations within the reserve. Camphor laurel occurs in low densities in parts of the reserve. These species have the potential to threaten the natural heritage of the reserve.</p> <p>Foxes, cats and rabbits occur in the area immediately north of the reserve.</p> <p>A Pest Management Strategy has been developed for the region as a whole. This strategy identifies pest populations, priorities for control and suggested control methods.</p> <p>Appropriate fencing is important to minimise the likelihood of domestic stock entering the reserve.</p>	<ul style="list-style-type: none"> • The impact of introduced species on native species and neighbouring lands is minimised. • That the spread of giant Parramatta grass by vehicles and the spread of moth vine are minimised or prevented. • Lantana and camphor laurel distribution does not expand beyond the current extent. • Any foxes, cats or rabbits found within the reserve are controlled. 	<ul style="list-style-type: none"> • Seek the cooperation of neighbours in implementing weed and pest animal control programs. Undertake control in cooperation with the Kempsey Rural Lands Protection Board, State Forests of NSW, Kempsey Council, the Mid North Coast Weeds Advisory Council, Country Energy and other stakeholders. • Control, and where possible eradicate, introduced pest plant and animal species found in the reserve in accordance with the Regional Pest Management Strategy. Control of giant Parramatta grass and moth vine will be a priority in the reserve. • Encourage maintenance of effective fencing of northern boundaries with grazing properties to prevent domestic stock entering the reserve. 	<p>Medium</p> <p>High</p> <p>Low</p>

Current Situation	Desired Outcomes	Strategies	Priority
<p>Fire management</p> <p>Fire is a natural feature of the environment of the reserve and is essential to the survival of some plant communities.</p> <p>Frequent or regular fire, however, can cause loss of particular plant and animal species and communities. Fire could also damage fences and threaten neighbouring land.</p> <p>The reserve is currently burnt at a frequency too high to maintain biodiversity.</p> <p>Management trails shown on the map are maintained for management and fire protection purposes.</p>	<ul style="list-style-type: none"> • The potential for spread of bushfires on, from, or into the park is minimised. • Life and property are protected from fire. • Fire regimes are appropriate for long-term maintenance of the park's plant and animal communities. 	<ul style="list-style-type: none"> • Prepare and implement a fire management strategy for the reserve. • Protect the dry rainforest and rainforest/wet sclerophyll forest communities in the reserve from fire. • The use of heavy machinery and vehicles for fire management purposes must be confined to trails shown on the reserve map. In emergency situations, former trails (e.g. logging trails) may be reopened if essential to protect natural or cultural values in or off the reserve. No new trails are to be constructed anywhere in the reserve. • Encourage research into the ecological effects of fire in the park, particularly the fire response of significant plant species and the fire requirements of the various plant communities (refer to Research). • Use prescribed fire to achieve a variety of fire regimes in appropriate vegetation types and maintain habitat suitable for species with specific requirements. • Continue active participation in the Kempsey Bush Fire Management Committee. Maintain close contact and cooperation with Council fire officers, volunteer bush fire brigades, State Forests of NSW and neighbours concerning fire management on an off the reserve. • The reserve may be closed to public use during periods of extreme fire danger. 	<p>High</p> <p>High</p> <p>High</p> <p>Low</p> <p>Low</p> <p>High</p> <p>High</p>

Current Situation	Desired Outcomes	Strategies	Priority
<p>Cultural heritage</p> <p>There are no known Aboriginal or European cultural sites within the reserves.</p> <p>No formal cultural heritage surveys have been undertaken in the reserve.</p>	<ul style="list-style-type: none"> Cultural heritage studies are undertaken and any objects or sites are appropriately recorded and protected. 	<ul style="list-style-type: none"> Undertake an archaeological survey and cultural assessment prior to all new works with the potential to impact on Aboriginal or non-Aboriginal sites and values. Maintenance of existing reserve infrastructure will not require this assessment. Consult with the Dughutti elders and the Kempsey Local Aboriginal Land Council in all aspects of management of Aboriginal sites, places and values. Provide copies of any research findings on Aboriginal cultural heritage to the Land Council (refer to Research). Encourage appropriate cultural heritage surveys of the reserve (refer to Research). 	<p>High</p> <p>Medium</p> <p>Low</p>
<p>Visitor use</p> <p>Use of the reserve must be carefully managed since it is a relatively small and significant area of remnant vegetation.</p> <p>Promotion of community understanding and appreciation of the conservation values of the reserve can minimise inappropriate visitor activities.</p> <p>The reserve currently receives very low levels of visitor use.</p> <p>Infrequent horse riding by casual riders, as well as non-competitive group rides, has</p>	<ul style="list-style-type: none"> There is widespread community understanding and appreciation of the reserve's natural and cultural values, as well as management programs. Visitor use is ecologically sustainable and consistent with its management as a nature reserve. Signage identifies the reserve boundaries and prohibited activities. 	<ul style="list-style-type: none"> Liaise with neighbours and community organisations to promote community understanding of the reserves values and management strategies. Permit nature based visitor use such as bushwalking, bird watching and nature observation in the reserve. Permit cycling on management trails in the reserve. Recreational wood fires and camping will not be permitted in the reserve. Subject to no unacceptable environmental or other impacts, up to 5 consents may be given each calendar year for groups of up to 10 horses to use Peach Tree Trail in Boonanghi Nature Reserve. 	<p>Low</p> <p>High</p> <p>Low</p> <p>High</p> <p>High</p>

Current Situation	Desired Outcomes	Strategies	Priority
<p>occurred along Peach Tree Trail.</p> <p>There are no visitor facilities within the reserve.</p>		<ul style="list-style-type: none"> • Competitive horse riding events and commercial horse riding will be prohibited in the reserve. • Public vehicles will not be permitted on roads and trails in the reserve, with the exception of Peach Tree Trail. • Erect tenure and information signage at reserve boundaries, indicating prohibited activities. No other visitor facilities will be provided. 	<p>High</p> <p>High</p> <p>High</p>
<p>Research</p> <p>Scientific study is needed to improve understanding of the reserve's natural and cultural values, the processes that affect them and the requirements for management of particular species.</p>	<ul style="list-style-type: none"> • Research that enhances the information base and assists management of the reserves is encouraged or undertaken. 	<ul style="list-style-type: none"> • Undertake or encourage appropriate research to improve knowledge and management of the reserve's natural and cultural heritage, as well as visitor use (refer to Native plant and animal conservation, Fire management and Cultural heritage). 	<p>Low</p>
<p>Management operations and non-NPWS use</p> <p>Vehicle access through the reserve is facilitating the spread of Giant Parramatta Grass.</p> <p>The southern boundary where the radio transmitters are located has not been surveyed and boundaries between the reserve and Boonanghi State Forest are not defined.</p>	<ul style="list-style-type: none"> • Management facilities adequately serve management needs and have acceptable impact. • Non-NPWS vehicle access is limited to Boonanghi Trigonometrical site and the radio transmitters, via Bullock trail, to reduce the spread of Giant Parramatta Grass. 	<ul style="list-style-type: none"> • Close, and rehabilitate where necessary, all roads not required for management purposes or essential access to private lands, and not shown on the map. • Maintain management trails to a minimum of 4WD dry weather standard (see reserve map). • In consultation with SFNSW and the Rural Fire Service, install the following preferred gates, at agreed specific locations and with agreed keying: <ul style="list-style-type: none"> – Boonanghi Trail/Kullatine Road Junction on Kullatine Trail; 	<p>High</p> <p>High</p> <p>High</p>

	<ul style="list-style-type: none"> • Access to and use of the Boonanghi radio transmitter site occurs under formal consent. 	<ul style="list-style-type: none"> – On either side of the radio towers on Boonanghi Trail, allowing access to the towers by Bullock trail only; – On Boonanghi Trail at the northern boundary of the reserve; – On Stony trail at Parrabel Creek; – On Stony Trail, south of Boonanghi Trail; – On Boonanghi Trail to the north of Peach Tree trail. <ul style="list-style-type: none"> • Gate other management trails as required. • Survey and formalise consent to the existing use of the radio tower and Boonanghi Trigonometrical site, for a defined area of the site within the reserve. 	<p>Low</p> <p>High</p>
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High priority activities are those imperatives to achievement of the objectives and desired outcomes. They must be undertaken in the near future to avoid significant deterioration in natural, cultural or management resources.

Medium priority activities are those that are necessary to achieve the objectives and desired outcomes but are not urgent.

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

5. REFERENCES

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