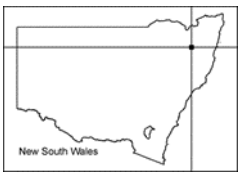
NSW NATIONAL PARKS & WILDLIFE SERVICE

Goonoowigall State Conservation Area, Barayamal National Park and Nullamanna National Park

Plan of Management



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Cover photo: Middle Creek, Goonoowigall State Conservation Area. Photo credit: Peter Croft/DPIE

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For additional information or any inquiries about this group of parks or this plan of management, contact the NPWS Glen Innes Area Office at 68 Church Street (PO Box 281), Glen Innes NSW 2370 or by telephone on 02 6739 0700.

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Environment, Energy and Science
Department of Planning, Industry and Environment
Locked Bag 5022, Parramatta NSW 2124
Phone: +61 2 9995 5000 (switchboard)
Phone: 1300 361 967 (Environment, Energy and Science enquiries)
TTY users: phone 133 677, then ask for 1300 361 967
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Contents

List of tables

List of figures

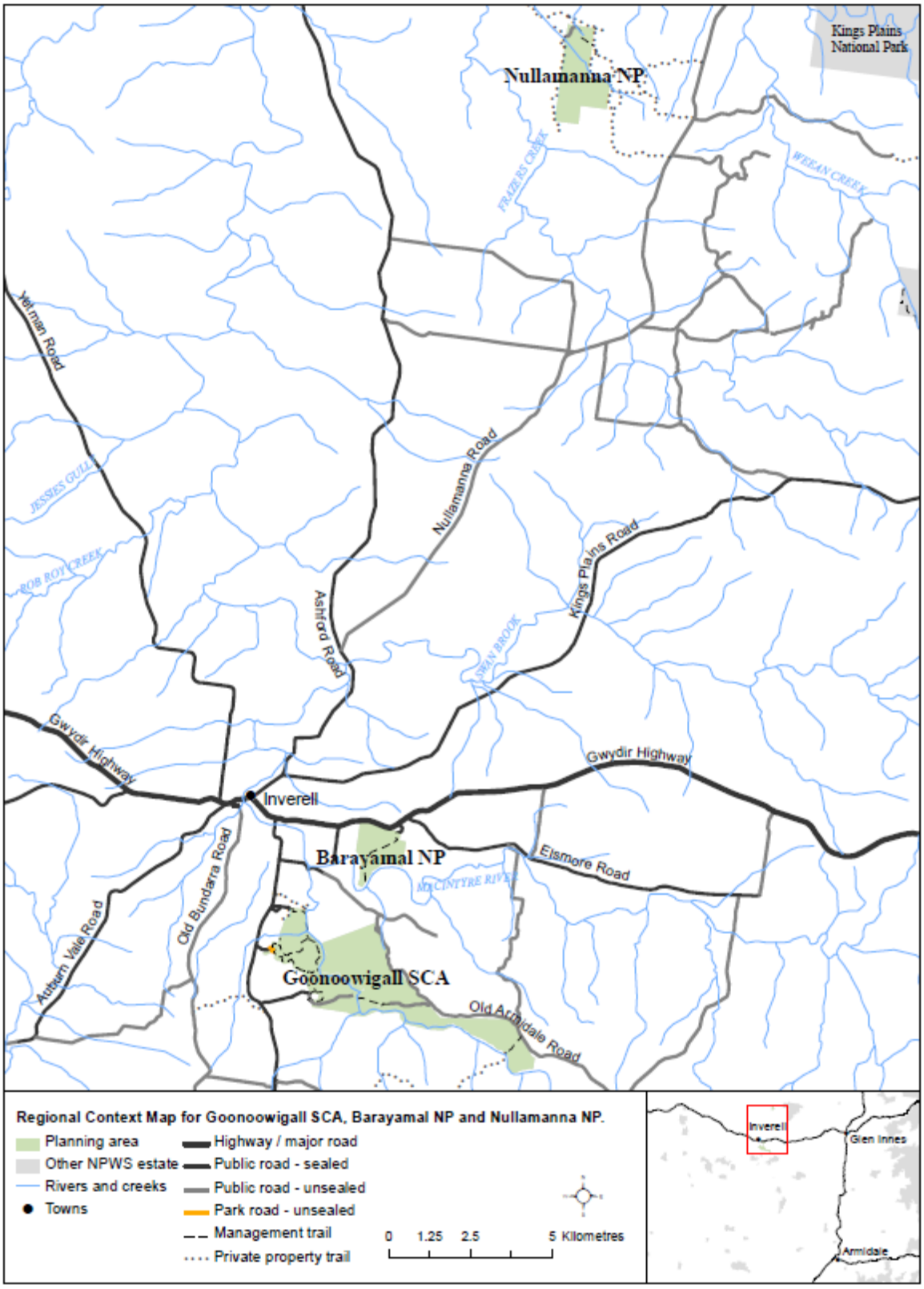

Figure 1 Location of the parks

1. Introduction

1.1 Location, reservation and regional setting

Features	Description
Location	Goonoowigall Community Conservation Area Zone 3 State Conservation Area (referred to as Goonoowigall State Conservation Area in this plan), Barayamal Community Conservation Area Zone 3 National Park and Nullamanna Community Conservation Areas Zone 3 National Park are collectively referred to as 'the parks' in this plan. The parks are located close to the township of Inverell in the New England North West region of New South Wales. Goonoowigall State Conservation Area is five kilometres south of Inverell. Barayamal National Park is five kilometres east of Inverell and Nullamanna National Park is located 31 kilometres north-east of Inverell. See Figure 1. The name *goonoowigall* is a Jukumbal Aboriginal word meaning 'wallaby rocks'. *Barayamal* and *nullamanna* are the local Aboriginal words for 'black swans' and 'large water hole' respectively.
Area	The parks collectively cover 1530 hectares. Goonoowigall State Conservation Area is 1055 hectares, Barayamal National Park is 179 hectares and Nullamanna National Park is 296 hectares.
Reservation date	The parks were all reserved on 1 December 2005.
Previous tenure	Goonoowigall State Conservation Area was formerly subject to tin mining that resulted in development of the township of Ferndale. The town, which was located in the park, is now abandoned and there are only a few relics from this time remaining in the park. The land was designated as a Crown land bushland reserve for public passive recreation and the preservation of native flora and fauna in 1976. It was administered by the Goonoowigall Bushland Reserve Trust until its reservation as a state conservation area in 2005. Barayamal National Park was previously Crown land, part of the Inverell town common designated in 1868. Nullamanna National Park was formerly part of Nullamanna State Forest. All parks were reserved under the *Brigalow and Nandewar Community Conservation Area Act 2005*. At the time of reservation, the Act used the spelling Goonoowigal which was then the official spelling for the name of the surrounding locality. The Geographical Names Board discontinued this spelling in 2007 in favour of Goonoowigall.
Regional context	
Biogeographic region	Goonoowigall State Conservation Area lies on the western edge of the New England Tablelands Bioregion, and Barayamal and Nullamanna national parks lie in the Nandewar Bioregion. They are part of a network of parks in the Inverell area that includes Kings Plain National Park, Tingha Plateau National Park and State Conservation Area, and Gwydir River National Park and State Conservation Area.
Surrounding land use	The surrounding landscape is mainly cleared farmland with some urban subdivision in areas close to Inverell.
Other authorities	The parks are located in the administrative areas of Inverell Shire Council, Northern Tablelands Local Land Services and Anaiwan Local Aboriginal Land Council.

1.2 Statement of significance

Goonoowigall State Conservation Area

Biological values: The park supports a number of species and communities listed as threatened under the *Biodiversity Conservation Act 2016*, including 14 animals, five plants and three threatened ecological communities (Howell Shrublands, McKies Stringybark / Blackbutt Open Forest, and White Box – Yellow Box – Blakely's Red Gum Grassy Woodland).

Aboriginal heritage values: The park has high cultural significance and was one of the most significant Aboriginal heritage areas assessed as part of Western Regional Assessment. It protects many important areas of cultural significance to Aboriginal people, including a significant art site and the remains of an Aboriginal camp.

Shared heritage values: The park contains various remains of tin mining sites and the historic settlement of Ferndale. The park has evidence of the early European settlement and development of Inverell and surrounds. Historic sites include a tannery, a wool scour, relics from tin mining, brickworks activities and the remains of the Ferndale settlement.

Landscape values: The park is one of the few remaining natural landscapes around Inverell. It features gently undulating terrain combined with spectacular granite boulders such as Thunderbolts Rock.

Recreational values: There is a network of popular walking tracks and trails through the park, providing visitors with access to features like Thunderbolts Lookout, Goonoowigall Falls and Middle Creek.

Barayamal National Park

Biological values: The park supports six threatened animal species, four threatened plant species and White Box – Yellow Box – Blakely's Red Gum Grassy Woodland.

Landscape values: The park is one of the few remaining natural landscapes around Inverell.

Nullamanna National Park

Biological values: The park supports four threatened animal species, one threatened plant species and a high diversity of bird species.

Aboriginal heritage values: Stone artefacts have been identified in the park.

Landscape values: The park is an isolated woodland remnant in a landscape that has been largely cleared.

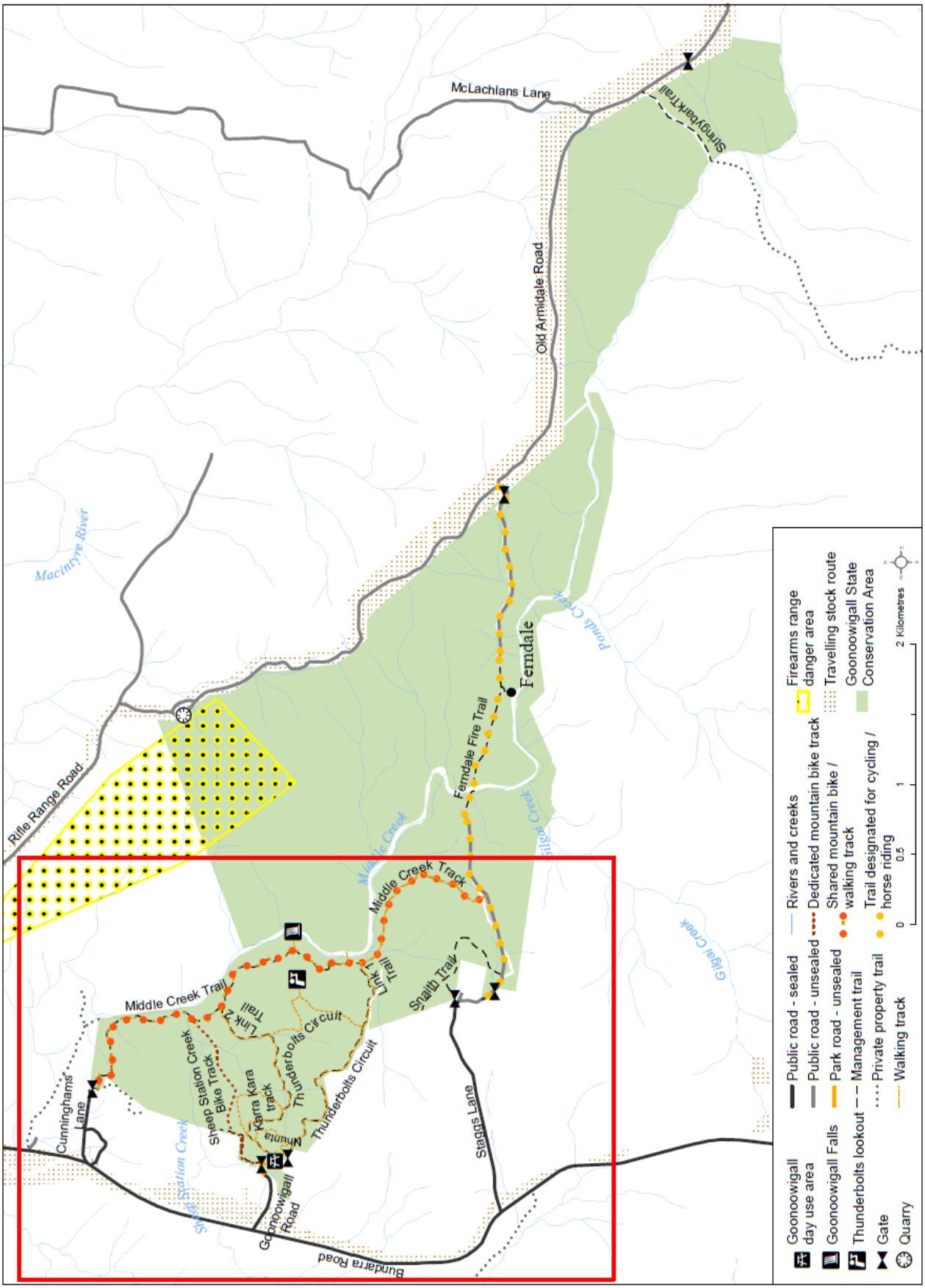

Figure 2 **Goonoowigall State Conservation Area**

Figure 3 **Inset showing day use area, cycling and walking tracks**

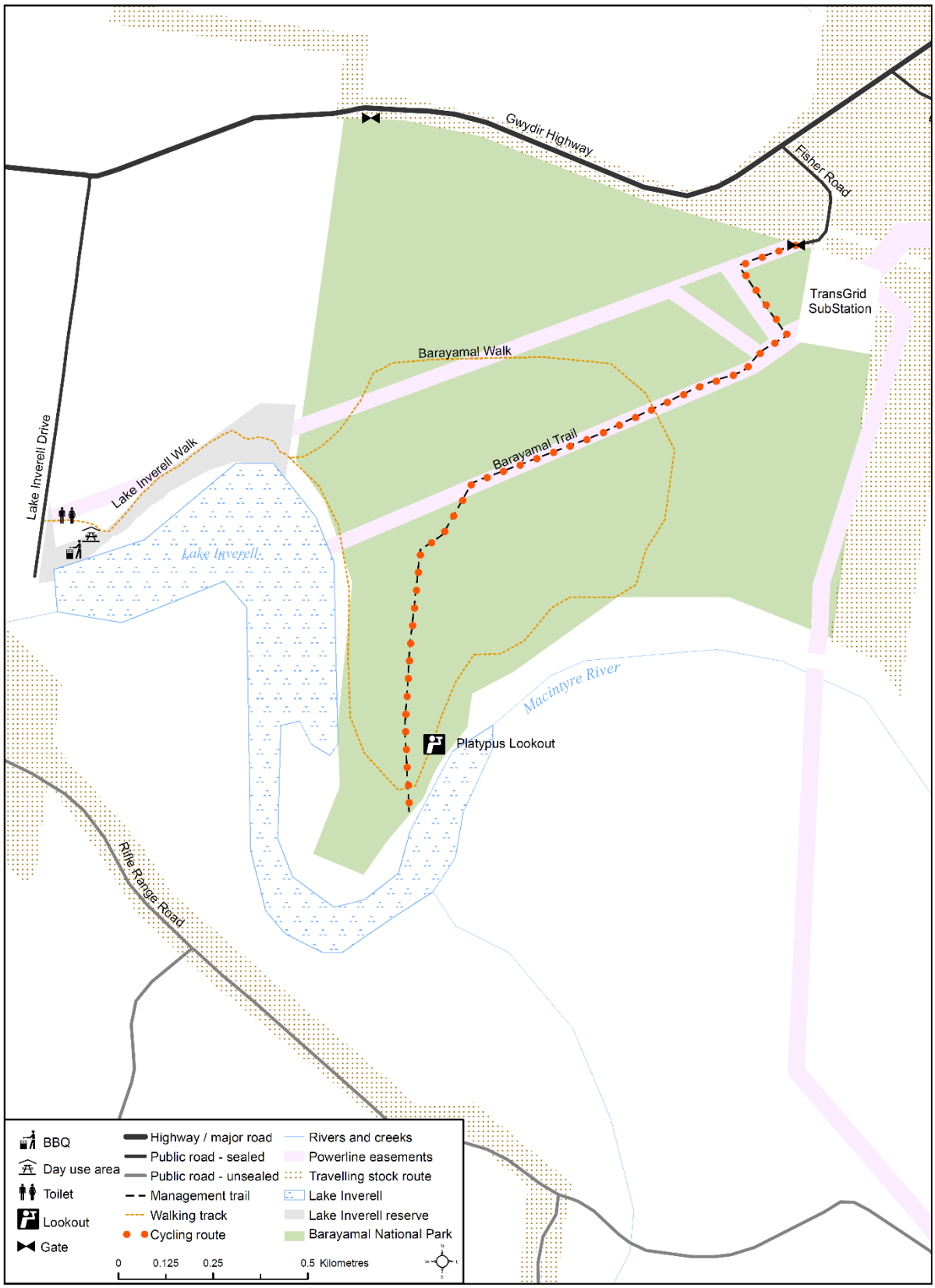

Figure 4 Barayamal National Park

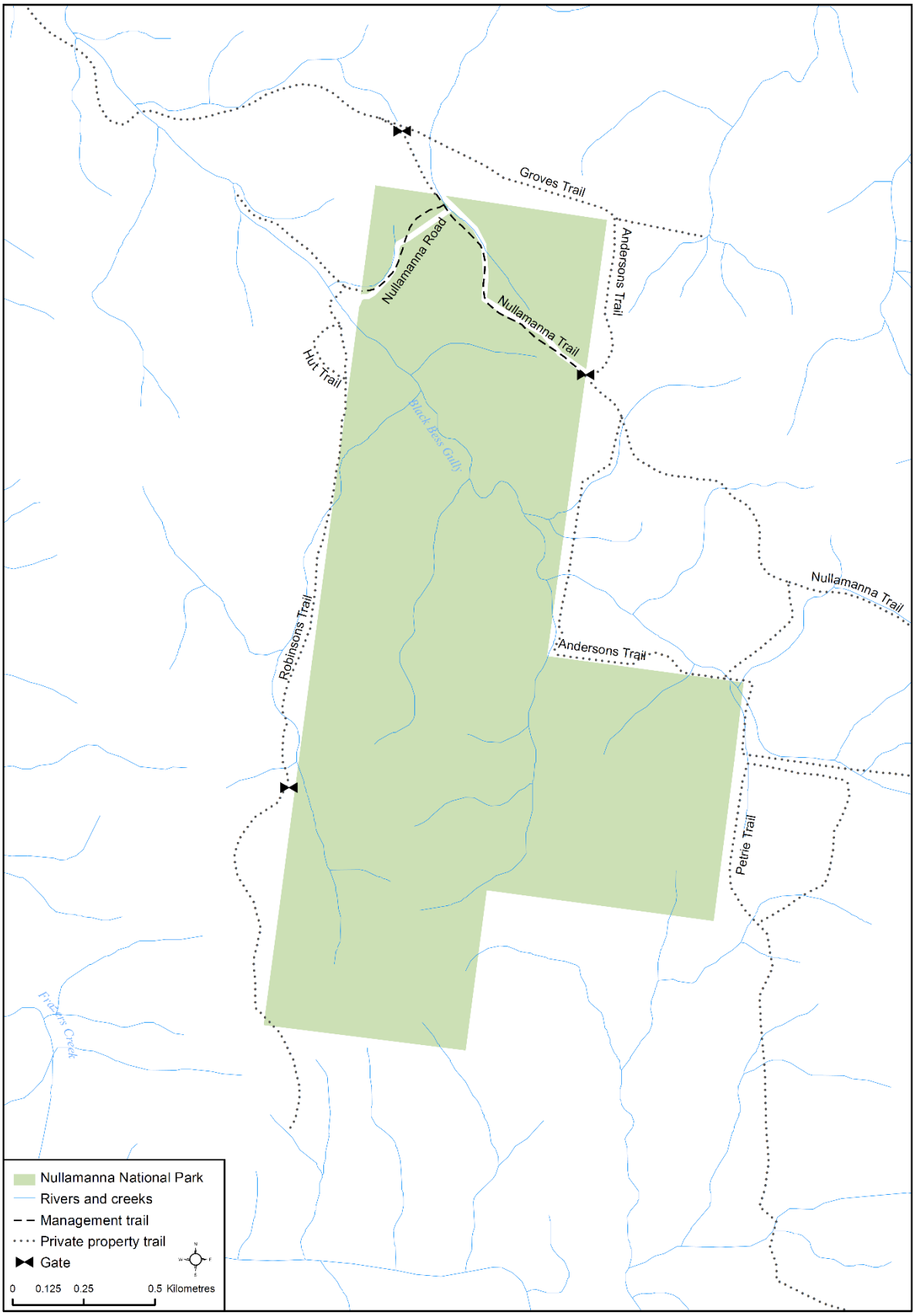

Figure 5 Nullamanna National Park

2. Management context

2.1 Legislative and policy framework

The management of these parks is in the context of the legislative and policy framework of the NSW National Parks and Wildlife Service (NPWS); primarily the *National Parks and Wildlife Act 1974* and Regulation, the Community Conservation Area Agreement developed under the *Brigalow and Nandewar Community Conservation Area Act 2005*, the *Biodiversity Conservation Act 2016* and NPWS policies.

Other legislation, strategies and international agreements may also apply to management of the area. In particular, the *Environmental Planning and Assessment Act 1979* may require assessment of the environmental impact of works proposed in this plan. The NSW *Heritage Act 1977* may apply to the excavation of known archaeological sites or sites with potential to contain historic archaeological relics. The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* may apply in relation to actions that impact matters of national environmental significance, such as migratory and threatened species listed under that Act.

A plan of management is a statutory document under the National Parks and Wildlife Act. Once the Minister has adopted a plan, the plan must be carried out and no operations may be undertaken within the parks except in accordance with the plan. This plan will also apply to any future additions to parks. Should management strategies or works be proposed in future that are not consistent with this plan, an amendment to the plan will be required.

2.2 Management purposes and principles

Community conservation areas

Community conservation areas are established under the Brigalow and Nandewar Community Conservation Area Act. That Act provides for four dedicated management zones of which zones 1, 2 and 3 relate to land reserved under the National Parks and Wildlife Act as a national park, Aboriginal area or a state conservation area respectively. Land in zones 1, 2 and 3 are managed consistent with the management principles set out in the National Parks and Wildlife Act.

Zone 1 national parks

Zone 1 community conservation areas, including Barayamal and Nullamanna, are reserved as national parks under the National Parks and Wildlife Act to protect and conserve areas containing outstanding or representative ecosystems, natural or cultural features or landscapes or phenomena that provide opportunities for public appreciation, inspiration and sustainable visitor or tourist use and enjoyment.

Under section 30E of the Act, Zone 1 community conservation areas are managed to:

- conserve biodiversity, maintain ecosystem functions, protect geological and geomorphological features and natural phenomena and maintain natural landscapes
- conserve places, objects, features and landscapes of cultural value
- protect the ecological integrity of one or more ecosystems for present and future generations
- promote public appreciation and understanding of the park's natural and cultural values

- provide for sustainable visitor or tourist use and enjoyment that is compatible with conservation of natural and cultural values
- provide for sustainable use (including adaptive re-use) of any buildings or structures or modified natural areas having regard to conservation of natural and cultural values
- provide for appropriate research and monitoring.

The primary purpose of Zone 1 community conservation areas is to conserve natural and cultural heritage. In doing so, opportunities are provided for appropriate and sustainable recreation.

Zone 3 state conservation areas

Zone 3 community conservation areas, including Goonoowigall, are reserved as state conservation areas under the National Parks and Wildlife Act to protect and conserve areas that:

- contain significant or representative ecosystems, landforms or natural phenomena or places of cultural significance
- are capable of providing opportunities for sustainable visitor or tourist use and enjoyment, the sustainable use of buildings and structures, or research
- are capable of providing opportunities for uses permitted under other provisions of the Act.

Under section 30G of the Act, Zone 3 community conservation areas are managed to:

- conserve biodiversity, maintain ecosystem functions, protect natural phenomena and maintain natural landscapes
- conserve places, objects and features of cultural value
- provide for the undertaking of uses permitted under other provisions of the National Parks and Wildlife Act (including uses permitted under section 47J such as mineral exploration and mining), having regard to the conservation of the natural and cultural values of the state conservation area
- provide for sustainable visitor or tourist use and enjoyment that is compatible with conservation of the area's natural and cultural values and with uses permitted in the area
- provide for sustainable use (including adaptive re-use) of any buildings or structures or modified natural areas having regard to conservation of the area's natural and cultural values and with other uses permitted in the area
- provide for appropriate research and monitoring.

Land is reserved as a state conservation area primarily where mineral values do not allow for reservation under another category. The National Parks and Wildlife Act requires a review of the classification of state conservation areas every five years in consultation with the Minister administering the *Mining Act 1992*. The review considers whether each state conservation area should or should not be reserved as either a national park or nature reserve.

Subject to the outcomes of future reviews, it is anticipated that Goonoowigall State Conservation Area will eventually become a national park and will continue to be covered by this plan of management. Meanwhile, the management of the state conservation area will be guided by the management principles for national parks as far as possible.

2.3 Specific management directions

The management challenge for the parks is to conserve and protect the natural and cultural heritage values, while providing for sustainable visitor use. In addition to the general principles for the management of these parks (see Section 2.2), the following specific management directions apply:

- Conserve natural and cultural values, and protect diverse plant and animal communities, including threatened species and ecological communities.
- Protect traditional and contemporary Aboriginal cultural heritage in partnership with local Aboriginal communities.
- Provide sustainable recreational activities in Barayamal National Park and Goonoowigall State Conservation Area.
- Provide interpretive and educational information that assists in visitor understanding and enjoyment of the parks.
- Control pest plant and animal species.
- Manage fire to protect life, property and biodiversity.
- Manage trails to provide for management purposes, property protection and emergency access.

3. Values

This plan aims to conserve both natural and cultural values of the parks. The location, landforms and plant and animal communities of an area have determined how it has been used and valued by Aboriginal and non-Aboriginal people. These 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. To make this plan clear and easy to use, various aspects of natural heritage, cultural heritage, threats and ongoing use are dealt with individually, although these features are interrelated.

3.1 Geology, landscape and hydrology

The topography of **Goonoowigall State Conservation Area** is variable, with slopes and ridges in the east and granite boulder formations at Thunderbolts Rock to the west reaching elevations of 740 metres (AMBS 2009). It lies on a geological formation known as the Gilgai Granite, which dates from the early Triassic or late Permian. Gilgai Granite is a fractionated leucogranite (granite igneous rock) which is responsible for most of the region's tin deposits (Brown 2006).

The park contains impressive outcrops of exposed granite which are a popular scenic feature enjoyed by visitors. Thunderbolts Lookout (see Figure 3) is one such granite outcrop that provides visitors the opportunity to appreciate the woodland vista and surrounding landscape, including the Inverell township. The red and yellow solodic soils on the upper slopes have high sand and gravel content, low fertility, are erodible and have a low water-holding capacity (Inverell Shire Council 2007).

Barayamal National Park is located on basalt which dates to the Tertiary period and has flat to gently undulating alluvial plains with an average elevation of 600 metres above sea level. The black earth soils found in the Tertiary basalt landscape on the foot slopes and floodplains have principally been farmed for cropping, pasture and timber. They are fertile, dark brown to black cracking clays with a friable and self-mulching surface (Inverell Shire Council 2007).

Nullamanna National Park is undulating to hilly and conserves part of Gagan Mountain, which has an altitude of 761 metres. It lies on a geological formation known as the Emmaville Volcanics, which are characterised by felsic volcanic rock. The soils are red and yellow solodic soils.

Goonoowigall State Conservation Area, and Barayamal and Nullamanna national parks are located within the Macintyre River catchment, which is part of the Border Rivers basin. Waterways in Goonoowigall State Conservation Area include Sheep Station Creek, Gilgai Creek and Ponds Creek, which are intermittent tributaries of Middle Creek. Middle Creek flows north and joins the Macintyre River, which borders Barayamal National Park on the southern side. Black Bess Gully runs through Nullamanna National Park and drains to Frazers Creek, joining the Severn River near Ashford.

Issues

- Soil erosion occasionally occurs on some of the trails and creeks in the parks. A Crown reserve along the course of Middle Creek is not part of Goonoowigall State Conservation Area and so NPWS has limited capacity to address erosion or other issues along this creek.

Desired outcomes

- The aesthetic values of the parks' landscapes are protected.
- The water quality of the parks' creeks and downstream waterways remains high.

Management response

3.1.1 Undertake works in a manner that minimises erosion and water pollution.

3.1.2 Monitor erosion on the network of tracks and trails in the parks and undertake remedial actions as required.

3.1.3 Seek the transfer of the Crown reserve along Middle Creek to Goonoowigall State Conservation Area

3.2 Native plants

The native plant communities of the parks were surveyed by Hunter in 2008 (Hunter 2008a, 2008b, 2008c), although many parts of the parks have not been comprehensively surveyed. The parks support a diverse range of native plant communities, including three threatened ecological communities listed in Table 1.

Table 1 Threatened ecological communities in the parks

Ecological community	Location	Status [1]	
		BC Act	EPBC Act
Howell Shrublands in the New England and Nandewar bioregions	Goonoowigall SCA	EEC	
McKies Stringybark / Blackbutt Open Forest in the Nandewar and New England Tablelands bioregions	Goonoowigall SCA	EEC	
White Box – Yellow Box – Blakely's Red Gum Grassy Woodland	Goonoowigall SCA Barayamal NP	EEC	CEEC

[1] BC Act = Biodiversity Conservation Act; EPBC Act = Environment Protection and Biodiversity Conservation Act; EEC = endangered ecological community; CEEC = critically endangered ecological community.

Goonoowigall State Conservation Area

Eight vegetation communities (see Appendix 1) and 481 plant species have been recorded in Goonoowigall (Hunter 2008b). Five plant species in the park are listed as threatened under the Biodiversity Conservation Act, four are also listed nationally, and the park supports eight species of regional significance (see Table 2).

The dominant vegetation community in Goonoowigall State Conservation Area, covering over 80% of the park, is Black Cypress Pine – Orange Gum [1]. These woodlands are part of the McKies Stringybark / Blackbutt Open Forest Endangered Ecological Community (Hunter 2008b).

Three of the plant communities in the park are part of the White Box – Yellow Box – Blakely's Red Gum Woodland Endangered Ecological Community. This community also

[1] Appendix 1 includes scientific names for plants mentioned in this section.

conforms to the definition of the critically endangered community White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland, which is listed under the Environment Protection and Biodiversity Conservation Act. These woodlands, referred to in this plan as Grassy Box Gum Woodlands, are critical habitat for the inland NSW breeding population of the threatened little lorikeet (*Glossopsitta pusilla*) (see Section 3.3), recognised as one of the woodland birds in decline in the State due to habitat clearance and fragmentation (Courtney & Debus 2006).

Goonoowigall State Conservation Area also supports Howell Shrublands Endangered Ecological Community, which is significant as there are only two other known reserved populations in the New England Bioregion (Hunter 2008b). There are 27 species of orchids known from the park, including the donkey orchid (*Diuris parvipetala*) and long tail greenhood (*Pterostylis woollsii*).

Barayamal National Park

Barayamal National Park contains large areas of regrowth due to past logging and grazing. Five vegetation communities have been described in the park, with four of the five communities recognised as being Grassy Box Gum Woodlands (see Table 1 and Appendix 1). The White Box – Red Stringybark Woodland community is an unusual variant and is of local importance due to its rarity in the park and the regional landscape (Hunter 2008a) (see Appendix 1). The park also contains two plants listed as vulnerable at the state and federal levels, and two that are listed as endangered (see Table 2).

Table 2 Threatened and significant plants in the parks

Common name	Scientific name	Status [1]		Location
		BC Act	EPBC Act	
Austral toadflax	*Thesium australe*	V	V	Barayamal NP
Bailey's indigo	*Indigofera baileyi*	E		Barayamal NP
Granite boronia	*Boronia granitica*	V	E	Goonoowigall SCA
Granite homoranthus	*Homoranthus prolixus*	V	V	Goonoowigall SCA
Hawkweed	*Picris evae*	V	V	Barayamal NP
Inverell cycad	*Macrozamia humilis*	E		Goonoowigall SCA
Lobed redgrass	*Bothriochloa biloba*		E	Barayamal NP
McKie's stringybark	*Eucalyptus mckieana*	V	V	Goonoowigall SCA
Native milkwort	*Polygala linariifolia*	E		Goonoowigall SCA Nullamanna NP
New England bottlebrush	*Callistemon pungens*		V	Goonoowigall SCA
Regionally significant plants				
	Cassinia macrocephala subsp. *tenuis* [2]			Goonoowigall SCA
Derwentia	*Derwentia arenaria*			Goonoowigall SCA
Donkey orchid	*Diuris parvipetala*			Goonoowigall SCA
Granite wattle	*Acacia granitica*			Goonoowigall SCA
Long tail greenhood	*Pterostylis woollsii*			Goonoowigall SCA

Common name	Scientific name	Status [1]	Location
McBarron's goodenia	*Goodenia macbarroni*		Goonoowigall SCA
Youman's stringybark	*Eucalyptus youmanii*		Goonoowigall SCA
Zieria	*Zieria odorifera*		Goonoowigall SCA

1 BC Act = Biodiversity Conservation Act; EPBC Act = Environment Protection and Biodiversity Conservation Act; V = vulnerable; E = endangered.

2 Known distribution is restricted to Goonoowigall (Orchard 2004).

Nullamanna National Park

In Nullamanna National Park, Tumbledown Gum – Black Cypress Pine is the dominant community, covering over 80% of the park. Five vegetation communities have been described in Nullamanna National Park (Hunter 2008c). Though none of the communities are listed as threatened, the park contains a significant stand (approximately 33 hectares) of Mugga Ironbark – Grey Box Woodland, which is of conservation significance (Hunter 2008c). This community contains mulga ironbark, which is a preferred food source for the critically endangered regent honeyeater (*Anthochaera phrygia*) (see Section 3.3). The ironbark has been harvested heavily in nearby areas in the past as it was used for construction and firewood. The park supports native milkwort, an endangered plant.

Strategies for the recovery of threatened species, populations and ecological communities have been set out in a statewide *Biodiversity Conservation Program* (OEH 2017). These actions are currently prioritised and implemented through the *Saving our Species* program, which aims to maximise the number of threatened species that can be secured in the wild in New South Wales for 100 years (OEH 2013b).

Individual recovery plans are prepared for nationally listed threatened species and some recovery plans were previously prepared for some species listed in New South Wales to consider management needs in more detail. To date, a national recovery plan has been prepared for granite boronia.

Issues

- Competition and habitat degradation by feral goats (*Capra hircus*) are threats to populations of granite homoranthus, granite boronia, native milkwort and zieria.
- Native plant communities are threatened by invasion of exotic perennial grasses, such as Coolatai grass (*Hyparrhenia hirta*).

Desired outcomes

- Knowledge of significant plant species and communities is improved.
- Significant ecological communities and populations are appropriately managed and conserved.

Management response

3.2.1 Implement relevant actions in the *Biodiversity Conservation Program* for threatened plant species, populations and communities that occur in the parks.

3.2.2 Work with neighbours to encourage conservation of remnant native vegetation near the parks to link habitat with known wildlife corridors.

3.3 Native animals

Goonoowigall State Conservation Area provides habitat for a range of native animal species including 108 birds, 16 reptiles, 13 mammals and seven frogs. Fourteen of these species have been listed as threatened under the Biodiversity Conservation Act (see Table 3). The park is also an important refuge for declining woodland bird species, with 14 of 20 species identified as in decline in the NSW sheep-wheat belt known to occur in the park (Reid 1999).

Table 3 Threatened animals in the parks

Common name	Scientific name	Status [1]		Location
		BC Act	EPBC Act	
Reptiles				
Border thick-tailed gecko	*Uvidicolus sphyrurus* [2]	V	V	Goonoowigall SCA Nullamanna NP
Birds				
Black-chinned honeyeater (eastern subspecies)	*Melithreptus gularis*	V		Goonoowigall SCA Nullamanna NP
Brown treecreeper	*Climacteris picumnus*	V		Goonoowigall SCA Barayamal NP Nullamanna NP
Diamond firetail	*Stagonopleura guttata*	V		Goonoowigall SCA Barayamal NP Nullamanna NP
Dusty woodswallow	*Artamus cyanopterus*	V		Goonoowigall SCA Nullamanna NP
Glossy black-cockatoo	*Calyptorhynchus lathami*	V		Goonoowigall SCA
Little eagle	*Hieraatetus morphnoides*	V		Goonoowigall SCA
Little lorikeet	*Glossopsitta pusilla*	V		Goonoowigall SCA Barayamal NP Nullamanna NP
Regent honeyeater	*Anthochaera phrygia*	CE	E	Goonoowigall SCA
Speckled warbler	*Pyrrholaemus saggitatus*	V		Goonoowigall SCA Nullamanna NP
Square-tailed kite	*Lophoictinia isura*	V		Barayamal NP
Turquoise parrot	*Neophema pulchella*	V		Goonoowigall SCA Barayamal NP
Varied sittella	*Daphoenositta chrysoptera*	V		Goonoowigall SCA Barayamal NP Nullamanna NP
Mammals				
Eastern long-eared bat	*Nyctophilus timoriensis*	V		Goonoowigall SCA
Koala	*Phascolarctos cinereus*	V	V	Barayamal NP

Common name	Scientific name	Status [1]		Location
Spotted-tailed quoll	*Dasyurus maculatus*	V	E	Goonoowigall SCA

[1] BC Act = Biodiversity Conservation Act; EPBC Act = Environment Protection and Biodiversity Conservation Act; V = vulnerable; E = endangered CE = critically endangered.

[2] Previously known as Underwoodisaurus sphyrurus.

The park lies within the Eastern Tablelands Corridor Complex, which connects landscape features such as the escarpment of the Great Dividing Range to the north-west slopes and Nandewar Bioregion. As one of the few bushland remnants that are conserved in the Tingha Plateau biogeographic area, the park is important in conserving the natural communities and species unique to the Tingha Plateau area. Minimising threatening processes within the park, and creating linkages with surrounding bushland, is considered critical to the survival of both common and threatened species.

Barayamal National Park is one of the few conserved remnant bushlands within the Northern Plains biogeographic province of the Nandewar Bioregion and is important in conserving communities and species unique to this area. Seven species listed as vulnerable have been recorded in the park (see Table 3). The park supports 79 bird species and is an important refuge for seven species of woodland birds that are known to be declining across the NSW sheep-wheat belt (Reid 1999).

Nullamanna National Park also represents an important local refuge for woodland birds in an otherwise highly cleared landscape. Ten bird species identified in the park are considered significant as they are woodland birds that are declining in New South Wales (Reid 1999). The park supports eight vulnerable animal species.

Both Nullamanna and Barayamal national parks are considered key refuges for bird species, particularly in times of drought (DECC 2007).

As for plants, strategies for the recovery of threatened animal species and populations have been set out in a statewide *Biodiversity Conservation Program* (OEH 2017). These actions are currently prioritised and implemented through the *Saving our Species* program, which aims to maximise the number of threatened species that can be secured in the wild in New South Wales for 100 years (OEH 2013b).

Individual recovery plans are prepared for nationally listed threatened species and some recovery plans were previously prepared for some species listed in New South Wales to consider management needs in more detail. To date, national recovery plans have been prepared for the regent honeyeater and spotted-tailed quoll.

Issues

- In the parks there has been a loss of hollow-bearing trees that are important roosting habitat for the vulnerable eastern long-eared bat and other micro-bats, and important nesting habitat for numerous bird species.
- Predation, habitat degradation, competition and disease transmission caused by feral pigs (*Sus scrofa*) are impacting park values.
- Predation by feral cats (*Felis catus*) and red foxes (*Vulpes vulpes*) is impacting native animals.
- There is limited information on native animals and no formal fauna surveys have been undertaken in the parks.

Desired outcomes

- Knowledge of the parks' significant animals and their habitat is improved.
- Negative impacts on threatened species are minimised.

Management response

3.3.1 Implement relevant actions in the *Biodiversity Conservation Program* and recovery plans for threatened species and populations in the parks.

3.3.2 Undertake fauna surveys in the parks to gather baseline data on fauna species.

3.4 Aboriginal heritage

The parks lie within the traditional Country of the Jukambul People and in the Anaiwan Local Aboriginal Land Council area. Jukambul People's land stretches from Bukkulla to Inverell, Bingara, Bundarra, almost to Tingha, Pindari and as far north as Wallangarra (Wiedemann 2001). The land, water, plants and animals 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, kinship systems and strengthening social bonds. Aboriginal heritage and connection to nature are inseparable and need to be managed in an integrated manner across the landscape.

Aboriginal sites are places with evidence of Aboriginal occupation or that are related to other aspects of Aboriginal culture. They are important as evidence of Aboriginal history and as part of the culture of local Aboriginal people.

Goonoowigall State Conservation Area contains the site of an Aboriginal camp at Sheep Station Gully (near Sheep Station Creek), known as 'the gully', that was occupied from the 1930s to 1960s. Many of the Aboriginal Elders who grew up in this camp now reside in nearby Inverell. Some still regularly visit the park and regard it as their childhood home.

The Inverell Reconciliation Group rehabilitated the old Aboriginal settlement area in Goonoowigall State Conservation Area prior to gazettal and established an educational walk now known as the Nhunta Karra Kara Track (see Section 3.6).

Although a systematic archaeological survey has not been carried out in Goonoowigall State Conservation Area, a cultural assessment was made as part of the Nandewar Western Regional Assessment Aboriginal Cultural Heritage Project (DECC 2003). The park was considered to have high cultural significance and is one of the most significant of the Crown land areas assessed as part of the Western Regional Assessment (RACAC no date). There are two recorded rock art sites in the park, one of which is contemporary art. The Australian Museum Aboriginal archaeological collection also contains flakes from the nearby Goonoowigall wool scour and from an area on the Old Armidale Road (AMBS 2009).

Little is known about past Aboriginal association with **Barayamal** or **Nullamanna** national parks. Nullamanna National Park has one artefact site recorded along a creek-line in the park and other artefact sites known at Frazers Creek close to the park. It is possible that there may be other sites within the parks.

Although the NSW Government has legal responsibility for the protection of Aboriginal sites and places, NPWS acknowledges the right of Aboriginal people to make decisions about their own heritage. Aboriginal communities will be consulted and involved in managing Aboriginal sites, places and related issues; and in promoting and presenting Aboriginal culture and history. The Goonoowigall Elders have expressed an interest in providing input into the management of sites within the state conservation area.

There is currently a Native Title registered claim NC2011/006 over the land within the parks, which is yet to be determined.

Issues

- The key threats to Aboriginal heritage values are visitor impacts, fire and use of heavy machinery.

Desired outcomes

- Aboriginal people are involved in managing Aboriginal cultural values in the parks.
- Understanding of the cultural values of the parks is improved.
- Significant Aboriginal cultural and historic heritage features are documented, assessed and protected as appropriate.

Management response

3.4.1 Continue to consult and involve the Anaiwan Local Aboriginal Land Council, Goonoowigall Elders and other relevant Aboriginal community organisations and custodial families in the management of their Country, including the management of Aboriginal sites and places, and cultural and natural values.

3.4.2 Undertake an archaeological survey and cultural assessment before all works with the potential to impact Aboriginal and historic sites or values.

3.4.3 Encourage further research into the Aboriginal and historic heritage values of the parks.

3.4.4 Monitor the condition of Aboriginal sites and the Nhunta Karra Kara Track and implement appropriate protection measures as required.

3.4.5 Record Aboriginal and historic heritage sites, assess sites for heritage significance, and retain in situ.

3.4.6 Provide opportunities for Aboriginal people to access Country, to maintain, renew or develop cultural practices and associations.

3.5 Shared heritage

Heritage places and landscapes are made up of living stories as well as connections to the past that individuals and communities have inherited from the past and wish to conserve for current and future generations, and can include natural resources, objects, customs and traditions. Cultural heritage comprises places and items that may have historical, scientific, aesthetic and social significance. NPWS conserves the significant heritage features of NSW parks and reserves.

There are sites of potential historic heritage value in **Goonoowigall State Conservation Area**. To date, most of these sites have not been fully assessed to determine their level of historic significance. Before decisions are made about the future management of the areas, an assessment of significance is required. Should the sites be found to be of national, state or high local historic heritage significance, a conservation management plan will be prepared. For simple structures of local heritage significance, a heritage action statement will be prepared to guide future management and works.

Tin was discovered in the area around 1872 and Middle Creek was mined for tin until the 1960s. Tin mining along Middle Creek and its tributaries brought thousands of men with their

families into the area (AMBS 2009 [2]). Within Goonoowigall State Conservation Area, evidence of mining includes several wide channels or water races such as 'The Slot', with tailing mounds also evident (AMBS 2009).

The site of the small abandoned township called Ferndale lies within Goonoowigall State Conservation Area. The small community was made up of farmers, tin miners and employees of the wool scour and tannery (AMBS 2009). Housing was built in the late 1800s and a one-teacher school was established in 1899 named the Cairnmore School. A wool scour operated at Ferndale from 1892 until the early 1920s (AMBS 2009). Water was supplied to the scour by a water race and the remains of the race and brick sluice gate exist in the park. Fellmongering (dealing in hides and skins) and tanning took place in the settlement. A brick works also operated in the park from around the 1880s to 1950s. The township was abandoned in the early 1920s and no buildings exist today. However, the hearths of some of the structures remain and three old elm trees identify a homestead site (AMBS 2009).

Thunderbolts Lookout is a popular location in Goonoowigall State Conservation Area. However, there is no evidence that it was ever used by Frederick Ward, the bushranger known as Thunderbolt.

Goonoowigall State Conservation Area was dedicated as Goonoowigall Bushland Reserve in 1976 for public passive recreation and the preservation of native flora and fauna. The park was administered by the Goonoowigall Bushland Reserve Trust until it was reserved as a state conservation area in 2005. Past members of the Trust have continued to provide input to park management as part of a local voluntary consultative group.

Barayamal National Park was used for grazing stock following its reservation as part of the Inverell town common in 1868. Although there are no recorded historic sites in the park, there is known to have been two huts and some fencing, and some trees were ringbarked.

There are no recorded historic sites in **Nullamanna National Park**. The land was a state forest before it was reserved as a national park in 2005. There is evidence of some logging of ironbark trees for posts and firewood throughout the park.

Issues

- Occasionally vegetation regrowth occurs around some of the historic heritage sites, such as the wooden hut footings in Goonoowigall State Conservation Area. This may be a possible fire hazard and can hinder people accessing and viewing heritage sites. Most of the heritage sites in the park are not fire-prone and are in scattered and isolated areas, which makes maintenance difficult.

Desired outcomes

- Significant historic features are appropriately conserved and managed.

Management response

3.5.1 Control vegetation around wooden hut footings to reduce fire risk.

3.5.2 Record historic sites and assess their significance.

[2] In developing AMBS 2009 report, local historical information was collected in consultation with local community members including former residents of Goonoowigall, residents of Inverell and staff of Inverell Library.

3.5.3 Undertake an archaeological survey and cultural assessment prior to all works with the potential to impact historic sites and places.

3.6 Visitor use

NPWS parks and reserves provide a range of visitor opportunities. NPWS aims to ensure that visitors enjoy, experience and appreciate parks at the same time as conserving and protecting park values.

Access, day use areas and walking tracks

Goonoowigall State Conservation Area is located approximately five kilometres south of Inverell. The main public vehicle access to the park is off Goonoowigall Road via the Bundarra Road, south of Inverell, which provides the only public vehicle access into the park (see Figure 3).

The park is popular with visitors for bushwalking, mountain bike riding, horse riding and birdwatching. Visitors also enjoy the spectacular boulders at Thunderbolts Lookout and the Goonoowigall Falls rock formation on Middle Creek, which flows in times of flood.

Goonoowigall Day Use Area is located at the main entrance to the park off Goonoowigall Road. This day use area is the starting point for the network of tracks and trails in the park and contains interpretation for the Nhunta Karra Kara Track (see Figure 3) and other park recreation information.

The Nhunta Karra Kara Track has numerous interpretive signs along its length, providing information on past Aboriginal use, bush tucker stories and cultural information for visitors. The track also includes a memorial for the Aboriginal people who lived in or travelled through the area in the past.

Barayamal National Park is located approximately five kilometres east of Inverell. Most visitors enter the park from the neighbouring Lake Inverell Reserve, along the Lake Inverell Walk (see below and Figure 4). Walking and cycling are the only means of public access within the park. Walking in the park is popular, particularly along Barayamal Walk, which is a marked walking route. This route complements Lake Inverell Walk located in the neighbouring Lake Inverell Reserve. Barayamal Walk includes interpretive signs that highlight various elements of the woodlands, as well as a seat at Platypus Lookout with views over Lake Inverell.

The neighbouring Lake Inverell Reserve off Lake Inverell Drive is managed by Inverell Shire Council. It provides day use facilities including picnic tables, toilets and gas barbecues.

Nullamanna National Park has no legal public vehicular access, visitor facilities or formed walking tracks (see Figure 5). Use of the park by the public is only possible if access can be negotiated with neighbouring landowners. Visitor facilities and recreational opportunities are provided nearby in Goonoowigall State Conservation Area, Kings Plains and Barayamal national parks and at Lake Inverell Reserve.

Horse riding

Horse riding is a popular recreational activity that has cultural associations for many Australians. The NPWS *Strategic Directions for Horse Riding in NSW National Parks* (OEH 2012) provides a framework to improve riding opportunities in eight priority regions in New South Wales, including the Northern Tablelands Region, which is now part of Northern Inland Branch.

Horse riding will be allowed in Goonoowigall State Conservation Area along Ferndale Trail (see Figures 2 and 3). Horse riding is not permitted on any other trails or tracks in the park.

The park does not provide for overnight camping with horses due to the lack of holding areas and potential disturbance to environmental and cultural values. Large groups of more than five horse riders are not permitted in the state conservation area.

Horse riding is not suitable in Barayamal and Nullamanna national parks due to their small size and lack of connectivity to existing horse trails.

Cycling

Cycling occurs in Goonoowigall State Conservation Area and Barayamal National Park. This plan allows for continued cycling along Middle Creek Trail and Ferndale Trail in Goonoowigall State Conservation Area, and along Barayamal Trail in Barayamal National Park (see Figures 3 and 4).

A mountain bike track, called Sheep Station Creek Bike Track, has been developed in Goonoowigall State Conservation Area (see Figure 3). It starts at Goonoowigall Day Use Area and continues to Middle Creek Trail. The track follows an old vehicular track and is for use by cyclists only.

Before development of the track, cyclists were using the walking track section of Thunderbolts Circuit between Link Trails 1 and 2 to access Middle Creek Trail (see Figure 3). This section of the walking track has steep sections and sharp corners, and there have been collisions between walkers and bike riders on this track. Due to these safety issues, this trail is not suitable for cycling and cycling is not permitted on Thunderbolts Circuit.

Issues

- Barayamal National Park has a history of informal camping along the edge of Lake Inverell. This activity has negatively impacted park values through soil compaction, vegetation removal, firewood collection and littering.
- Campfires have been a cause of bushfires in Barayamal National Park.
- Before the reservation of Goonoowigall State Conservation Area, dog walking occasionally occurred in sections of the park. Consistent with NPWS policy, this activity is not allowed in the park.

Desired outcomes

- Visitor use of the parks is appropriate and ecologically sustainable.
- Negative impacts of visitors on park values are minimised.
- Visitor opportunities encourage appreciation and awareness of park values and their conservation.

Management response

3.6.1 Maintain the management trail and walking track networks for the parks as shown on Figures 2, 4 and 5.

3.6.2 Public vehicle access is only permitted on Goonoowigall Road in Goonoowigall State Conservation Area.

3.6.3 Maintain Goonoowigall Day Use Area and the interpretation signs in Goonoowigall State Conservation Area.

3.6.4 Camping, campfires and dogs (dog walking) are not permitted in any of the parks.

Horse riding

3.6.5 Allow horse riding along Ferndale Trail in Goonoowigall State Conservation Area and signpost accordingly. Horse riding is not permitted on any other tracks or trails in the state conservation area.

3.6.6 Horse riding is not permitted in Barayamal and Nullamanna national parks.

3.6.7 Camping with horses is not allowed in any of the parks.

3.6.8 Monitor the social and environmental impacts of horse riding, including erosion and weed impacts. Horse riding routes may be closed for rehabilitation where impacts are identified.

Cycling

3.6.9 Allow cycling on Middle Creek Trail, Ferndale Trail and Sheep Station Creek Track in Goonoowigall State Conservation Area; and along Barayamal Trail in Barayamal National Park (as shown on Figures 2 and 4). Cycling will not be allowed on any other track or trail in the parks, including Nhunta Karra Kara Track and Thunderbolts Circuit in Goonoowigall State Conservation Area.

3.6.10 Manage Sheep Station Creek Bike Track as a cyclists-only mountain bike track and signpost accordingly.

3.6.11 Install signs on the roads and trails in the parks where cycling is allowed.

3.6.12 Roads and trails may be closed to cycling where there is unacceptable environmental impact or risk to cyclists and other users.

3.6.13 Trails will be monitored and areas showing signs of unacceptable damage will be closed to cycling.

4. Threats

4.1 Pests

Pest species are plants, animals and pathogens that have negative environmental, economic and social impacts and are most commonly introduced species. Pests can have impacts across the range of park values, including impacts on biodiversity, cultural heritage, catchment and scenic values.

The *Biosecurity Act 2015* and its regulations provide specific legal requirements for the response, management and control of biosecurity risks, including weeds and pest animals. These requirements apply equally to public and privately owned land. Under this framework, Local Land Services (LLS) has prepared regional strategic weed management plans and regional strategic pest animal management plans for each of its 11 regions, including Northern Tablelands Region (Northern Tablelands LLS 2017, 2018).

The LLS plans identify priority weeds and pest animals in each of the regions, plus the appropriate management response for the region (i.e. prevention/alert, eradication, containment or asset protection).

NPWS prepares regional pest management strategies which identify the operations and control actions undertaken by NPWS to meet the priorities from regional strategic pest and weed management plans. This also includes other important programs such as the *Biodiversity Conservation Program* (see Sections 3.2 and 3.3). The overriding objective of the NPWS regional pest management strategies is to minimise adverse impacts of introduced species on biodiversity and other park and community values while complying with legislative responsibilities. These strategies are regularly updated. Reactive programs may also be undertaken in cooperation with neighbouring land managers, in response to emerging issues.

Pest species that are also key threatening processes may be managed under the *Biodiversity Conservation Program* where it includes key threatening processes strategies. The *Saving our Species* program has developed targeted strategies for managing key threatening processes using the best available information to minimise current and future impacts of key threatening processes on priority biodiversity values, including threatened species and ecological integrity.

Major pests of concern in the parks are listed in Table 4. These are currently targeted in priority regional pest programs. However, priorities may change over time as pests are brought under control, or as new threats emerge.

Weeds

Weeds, in particular the state-level priority blackberry, have been identified as impacting habitat structure and composition and some vulnerable plant communities in the parks.

Table 4 identifies priority weeds species in the parks. These priority species pose the greatest threat to the natural values and threatened species in the parks. Specific management programs are designed to control these species. All other weed species recorded in the parks will be monitored and controlled where possible.

In **Goonoowigall State Conservation Area** the tree of heaven infestation was dense along large sections of Middle Creek when the area was reserved in 2005. Since then, weed control efforts have reduced the infestation to less than 10% of its original area. Coolatai grass spraying has been undertaken each year and will be an ongoing focus throughout the parks. Control of Coolatai grass is a priority action for the recovery of the vulnerable species,

granite homoranthus, which is known to occur in the state conservation area. Control of weed species in Howell Shrublands is also a high priority (see Section 3.2).

Table 4 Significant weeds and pests in the parks

Common name	Scientific name	Location
Weeds		
African lovegrass	*Eragrostis curvula* [1]	Barayamal NP
Blackberry	*Rubus fruticosus* [2, 3, 4]	Goonoowigall SCA Barayamal NP
Coolatai grass	*Hyparrhenia hirta* [1]	All three parks
Mother of millions	*Bryophyllum* spp.	Goonoowigall SCA
Osage orange	*Maclura pomifera*	Barayamal NP
Prickly pear	*Opuntia* spp.	All three parks
Privet	*Ligustrum lucidum* [4]	Barayamal NP
St John's wort	*Hypericum perforatum* [4]	Barayamal NP
Tree of heaven	*Alianthus altissima*	Goonoowigall SCA Barayamal NP
Pest animals		
Feral cat	*Felis catus* [4]	All three parks
Feral goat	*Capra hircus* [4]	Goonoowigall SCA Nullamanna NP
Feral pig	*Sus scrofa* [4]	Goonoowigall SCA Nullamanna NP
Red fox	*Vulpes* [4]	All three parks
Rabbit	*Oryctolagus cuniculus* [4]	All three parks
Wild dog	*Canis familiaris* [4]	Nullamanna NP

[1] Other regional weeds (Northern Tablelands LLS 2017).

[2] Weed of National Significance.

[3] State-level priority weeds (Northern Tablelands LLS 2017).

[4] Regional priority weed or pest animal (Northern Tablelands LLS 2017, 2018).

Barayamal National Park has three major cleared power easements that transect the park. These areas have extensive weed infestations and will continue to be the focus of annual weed spraying programs. Coolatai grass has entered the park from the highway and has invaded the park up to 100 metres from the park boundary in some places. Weed infestations along the river foreshore are also a priority, including Coolatai grass, St John's wort, blackberry, prickly pear, privet and Osage orange.

Nullamanna National Park does not currently have major infestations of any weed species but there are isolated occurrences of prickly pear, and Coolatai grass occurs in grazing lands surrounding the park.

Pest animals

Pest animals that occur in the parks are listed in Table 4. Each of these species pose a threat to threatened species and are listed as key threatening processes under the Biodiversity Conservation Act and the Environment Protection and Biodiversity Conservation

Act (except wild dogs, which are not listed under Commonwealth legislation). The impact of feral pigs and feral goats on conservation values is substantial. Feral pigs cause major disturbance and damage to soils, roots, sensitive ground flora and wetland environments. Areas disturbed by feral pigs are at risk from subsequent weed invasion and soil erosion. Feral goats graze native plants, compete with native animals for shelter, spread weeds, trample vegetation and can damage Aboriginal heritage sites.

Feral pigs and goats are a threat to the vulnerable granite homoranthus and endangered Howell Shrublands. Major threats to the granite boronia are the impacts of inappropriate fire regimes and browsing by stock and feral goats (NPWS 2002). Grazing by feral goats is also considered a major threat to the endangered Inverell cycad and native milkwort, and the regionally significant granite wattle, *Derwentia arenaria* and *Zieria odorifera* (Hunter 2008b).

Wild dogs are known to occur in and around Nullamanna National Park. In NSW, the term 'wild dog' refers to all wild-living dogs: dingoes, feral domestic dogs and the hybrid descendants of these, all of which are currently considered to be *Canis familiaris* (LLS 2018). Wild dogs may also have significant impacts on the distribution and abundance of native wildlife. NPWS will continue to include Nullamanna National Park in wild dog control programs as required.

Stock occasionally stray into the parks from neighbouring properties where fencing is inadequate.

Desired outcomes

- Pest plants and animals are controlled and where possible eliminated.
- Negative impacts of pest species on park values are minimised.

Management response

4.1.1 Continue weed control and pest animal control programs as outlined in pest management strategies relevant to the park.

4.1.2 Seek the cooperation of neighbours in implementing weed and pest control programs. Undertake control in cooperation with the Northern Tablelands Local Land Services, Landcare groups and neighbours.

4.1.3 Monitor priority weeds and their impacts. Treat any new outbreaks where possible.

4.1.4 Develop and implement boundary fencing agreements with neighbours where appropriate in accordance with NPWS policy.

4.2 Fire

The primary objectives of NPWS fire management are to protect life, property, community assets and cultural heritage from the adverse impacts of fire, while also managing fire regimes in parks to maintain and enhance biodiversity. NPWS also assists in developing fire management practices that contribute to conserving biodiversity and cultural heritage across the landscape, and implements cooperative and coordinated fire management arrangements with other fire authorities, neighbours and the community (OEH 2013a).

Fire is a natural feature of many environments and is essential for the survival of some plant communities. However, inappropriate fire regimes can lead to loss of particular plant and animal species and communities, and high frequency fires have been listed as a key threatening process under the Biodiversity Conservation Act (NSW SC 2000b).

Anecdotal information of the wildfire history of **Goonoowigall State Conservation Area** suggests that the whole park was burnt in 1956. Other significant fire events include a fire in

1982 where over 60% of the park was burnt. Since that time, there have been two smaller wildfires caused by arson and more recently, a significant wildfire in December 2019 that burnt approximately 66% of the park. The wildfire, and associated asset protection work undertaken, caused damage to a variety of assets including signage, tables, tracks and trails. Replacement of damaged assets and remediation of tracks and trails will be undertaken where necessary. The wildfire burnt intensely in some parts of the reserve, including rock outcrops, where the Howell Shrublands Endangered Ecological Community was affected. The recovery of this community, and flora and fauna generally, will be monitored especially for any weed ingress.

Assets that are vulnerable to fire in the park include the day use facilities and some cultural sites. Neighbouring assets at risk from fire include nearby housing and farming infrastructure. The park is adjoined by small, rural residential, private landholdings with the greatest density occurring on Cunninghams Lane, Staggs Lane, Goonoowigall Road and Rifle Range Road.

The most recent fire in **Barayamal National Park** was in 2008 and was caused by arson. Escaped campfires have also been ignition sources in the past. A comprehensive fire history for the park prior to gazettal is not known. Assets that are vulnerable to fire near the park are the TransGrid substation and nearby houses.

There is no comprehensive fire history for **Nullamanna National Park**, however, some neighbours have stated there has been no fire in the park for over 100 years. Robinsons Hut, a drover's hut on a property west of the park, is an asset that is vulnerable to fire.

Fire management strategies, which define the fire management approach for the parks, have been prepared (NPWS 2008, 2009) and these are updated periodically. The fire management strategies outline the recent fire history of the parks, key assets within and adjoining the parks including sites of natural and cultural heritage value, and fire management zones and fire control advantages such as management trails and water supply points. The strategies also contain fire regime guidelines for conservation of the parks' vegetation communities. An asset protection zone is maintained in Barayamal National Park near the TransGrid substation.

NPWS maintains cooperative arrangements with surrounding landowners and the Rural Fire Service and is actively involved with the Northern Tablelands Bush Fire Management Committee. Cooperative arrangements include fire planning, fuel management and information sharing. Hazard reduction programs, ecological burning proposals and fire trail works are submitted annually to the bush fire management committee.

Desired outcomes

- Negative impacts of fire on life, property and the environment are minimised.
- The potential for spread of bushfires on, from or into the parks is minimised.
- Fire regimes are appropriate for conservation of native plant and animal communities.

Management response

4.2.1 Implement the fire management strategies for the parks and update as required.

4.2.2 Continue to be involved in the Northern Tablelands Bush Fire Management Committee and maintain cooperative arrangements with local Rural Fire Service brigades, other fire authorities and surrounding landowners regarding fuel management and fire suppression.

4.2.3 Suppress unplanned fires in the parks in accordance with the fire management strategies.

4.2.4 Manage the parks to protect biodiversity in accordance with the identified fire regimes in the fire management strategies.

4.2.5 Monitor the ability of flora to recover between fires and review regimes where relevant.

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

4.3 Unauthorised vehicles

The parks contain a network of management trails for fire and pest management purposes. In accordance with NPWS policy, these management trails are only available for management vehicles and other authorised users and are not available for public vehicle access. Motorbike riding has occurred in Goonoowigall State Conservation Area and Barayamal National Park in the past. Significant damage has occurred in some areas including the development of unauthorised trails. These trails have caused erosion, fragmentation and damage to vegetation.

Motorbike riding also impacts the safety of other trail users in these parks including bushwalkers, horse riders and cyclists. There have been a few incidents reported where walkers have encountered motorbike riders travelling at high speeds. NPWS has undertaken an education program to inform visitors that management trails are not available for unauthorised vehicle use. This approach has significantly reduced the use of motorbikes in these parks.

Desired outcomes

- Unauthorised use of management trails in the parks is minimised.
- Negative impacts on park values are minimised.

Management response

4.3.1 Continue ongoing education programs to minimise unauthorised use of management trails by motorbike riders.

4.3.2 Monitor illegal motorbike use on management trails. Where required, install and

4.4 Isolation and fragmentation

The area surrounding the parks has been extensively cleared, which has resulted in a high loss of biodiversity and has fragmented the landscape and reduced habitat (Hunter 2008c). The parks comprise three areas that are relatively small and isolated and subject to edge effects, making them more vulnerable to disturbances. Adjacent land uses place pressures on the parks through the incursion of pest plant and animal species such as Coolatai grass and blackberry. Adjacent urbanised land also impacts the parks through a range of activities such as predation by pets, stormwater drainage, encroachments and unauthorised recreational activities.

Cooperative arrangements with neighbours are important for the management of access, fire, weeds and pest animals. Additionally, long-term conservation of biodiversity depends on the protection, enhancement and connection of remaining habitat across the landscape, incorporating vegetation remnants on both public and private lands.

Nearby vegetated areas, for example a voluntary conservation area near Nullamanna National Park, contribute to the habitat values of the parks. Maintaining the integrity of the

remaining habitat in the parks, and where possible linking the parks to adjacent areas of vegetation to facilitate wildlife movement, is important in ensuring the long-term viability of the parks' biological values.

Desired outcome

- The negative impacts of isolation and fragmentation are reduced.

Management response

4.4.1 Maintain cooperative arrangements with nearby landholders regarding access, fire and pest species management.

4.4.2 Encourage protection and enhancement of native vegetation on public and private lands in the vicinity of the parks.

4.4.3 Liaise with neighbours, local council and Northern Tablelands Local Land Services to encourage the retention and appropriate management of key habitat and corridors adjacent to the parks.

4.5 Climate change

Human-induced climate change is listed as a key threatening process under the Biodiversity Conservation Act (NSW SC 2000a) and the associated loss of habitat is listed under the Environment Protection and Biodiversity Act (TSSC 2001). The latest information on projected changes to climate are from the NSW and ACT Regional Climate Modelling ('NARClim') project (OEH 2014). The climate projections for 2020–2039 are described as 'near future'; and projections for 2060–2079 are described as 'far future'. The snapshot shown in Table 5 is for the Northern Tablelands Region, which includes the parks (OEH 2014).

Table 5 Northern Tablelands climate change snapshot

Projected temperature changes	
Maximum temperatures are projected to increase in the near future by 0.4–1.0°C	Maximum temperatures are projected to increase in the far future by 1.9–2.7°C
Minimum temperatures are projected to increase in the near future by 0.5–1.0°C	Minimum temperatures are projected to increase in the far future by 1.6–2.7°C
The number of hot days will increase	The number of cold nights will decrease
Projected rainfall changes	
Rainfall is projected to decrease over most of the region in winter	Rainfall is projected to increase in autumn
Projected Forest Fire Danger Index changes	
Average fire weather is projected to increase during summer, spring and winter	Severe fire weather days are projected to increase in summer and spring

Source: OEH 2014.

The projected increases in temperature, number of hot days (OEH 2014) and high fire risk days are likely to influence fire frequency and intensity across the region, and the fire season is likely to be extended (DECCW 2010).

Climate change may significantly affect biodiversity by changing the size of populations and the distribution of species, and altering the geographical extent and species composition of

habitats and ecosystems. Species most at risk are those unable to migrate or adapt, particularly those with small population sizes or slow growth rates.

The potential impact of climate change on the parks is difficult to assess since it depends on the compounding effects of other pressures, particularly barriers to migration and pressure from introduced animals. If fire extent increases under future conditions of increased fire danger, however, fire-sensitive ecosystems such as Howell Shrublands could undergo structural and compositional changes. Changes in the fire regime are likely to compound the impacts of other climatic changes; for instance, disturbance by fire together with an increase in summer rainfall is likely to benefit certain weeds.

NPWS will continue to manage threats from climate change to park values in a collaborative way with other land managers. The presence of the parks will improve the resilience of natural and cultural values through the protection of native flora and fauna (DECCW 2010). Furthermore, programs to reduce the pressures arising from other threats, such as invasive species and bushfires, will also help reduce the severity of the effects of climate change.

Desired outcome

- The impacts of climate change on natural systems are minimised.

Management response

4.5.1 Continue existing fire, pest and weed management and bushland restoration programs and adapt where required to minimise climate change-induced threats.

5. Management operations and other uses

5.1 Management facilities and operations

There are several management trails in the parks that are maintained for operational purposes. In accordance with NPWS policy, vehicle use of management trails is only available for authorised activities such as essential park management, fire and emergency response. Use of management trails by the public is generally limited to bushwalking, and some management trails are designated for use by cyclists and horse riders (see Section 3.6).

There is a disused quarry partly in Goonoowigall State Conservation Area on the Old Armidale Road that is no longer required as a resource. Motocross and motorbike riding have been occurring illegally in the quarry. These activities have caused erosion and damaged revegetation. NPWS has undertaken some rehabilitation works at the quarry and has placed logs and vegetation in strategic positions to try and stop motorbike activities and encourage rehabilitation of vegetation.

The eastern and western ends of Ferndale Trail generally align with two Crown road reserves and are not part of Goonoowigall State Conservation Area (see Figure 2). In the past the section of Ferndale Trail within the park was used for dog walking, which is not permitted under NPWS policy.

Desired outcome

- Facilities and operations have minimal impact on the parks.

Management response

5.1.1 Maintain the network of park roads and management trails as shown on Figures 2, 4 and 5. Install gates and/or signs to prevent unauthorised public vehicle access to management trails where required.

5.1.2 Seek inclusion of the Ferndale Trail Crown road reserves into Goonoowigall State Conservation Area.

5.1.3 Continue to rehabilitate the former quarry using measures such as erosion control earthworks, rubbish removal, fencing of areas to allow for regeneration and weed control as appropriate.

5.2 Non-NPWS uses and operations

Mining and exploration

Exploration for minerals and petroleum (including gas), as well as mining and petroleum production, are permissible uses in state conservation areas. Goonoowigall State Conservation Area has current group one (metallic minerals), group six (corundum, diamond, ruby and sapphire) and petroleum exploration titles. No current mining titles have been granted.

NPWS will work with the relevant regulatory authority to ensure that exploration and production proposals in state conservation areas comply with all statutory requirements, including any necessary environmental impact assessments and approvals.

Fossicking is generally not permitted in parks because it can pose unacceptable risks to natural and cultural values (OEH 2018). Fossicking has not been undertaken in the parks since they were reserved and will not be permitted in these parks.

Transmission lines

Barayamal National Park has three power easements for high voltage transmission lines that transect the park (see Figure 4). These easements are approximately 30 metres wide. The easements fragment the park and weed species have established along their edges. Essential Energy and TransGrid periodically maintain these electricity easements, including the control of weeds.

TransGrid maintains one high voltage electricity transmission line in the park, which is covered by a formal easement. Transmission lines and associated management generate impacts from clearing or trimming of vegetation, use of herbicides and the maintenance of access trails, as well as the visual impact of the lines and towers. These impacts are minimised through a statewide agreement between TransGrid and NPWS relating to the inspection and maintenance of existing transmission lines and infrastructure.

Essential Energy maintains the other two powerlines traversing the park, which are also covered by a formal easement. In accordance with the *Electricity Supply Act 1995,* a network operator can operate and use the existing powerlines whether or not there is a formal easement in place.

Clearings and vehicle trails along the powerlines have environmental and visual impacts. No access or maintenance agreement currently exists with Essential Energy but the company must comply with the National Parks and Wildlife Act and Regulation when carrying out any maintenance or replacement work and will require NPWS consent for certain works.

Rifle range

Inverell Rifle Range is located to the north-east of Goonoowigall SCA (see Figure 2). NPWS is installing signage along the rifle range danger zone where it intersects with Goonoowigall SCA to improve public safety.

Desired outcomes

- Mining and mineral exploration activities have minimal impact on natural and cultural values.
- Non-NPWS related uses and activities are managed to minimise impacts on park values and infrastructure.
- The TransGrid transmission line in Barayamal National Park is managed in accordance with the statewide easement and maintenance agreement.
- Essential Energy transmission lines in the parks are managed in accordance with consent and protocol.

Management response

5.2.1 Applications for mining or mineral exploration in the Goonoowigall State Conservation Area will be subject to environmental impact assessment and approvals.

5.2.2 Continue to liaise with TransGrid regarding access and maintenance needs in accordance with the agreement.

5.2.3 Continue to liaise with Essential Energy regarding access and maintenance needs in accordance with the protocol.

6. Implementation

This plan of management establishes a scheme of operations for Goonoowigall State Conservation Area and Barayamal and Nullamanna national parks.

Identified activities for implementation are listed in Table 6. Relative priorities are allocated against each activity as follows:

High priority activities are imperative to achieve the objectives and desired outcomes of this plan, and must be undertaken in the near future to avoid significant deterioration in natural, cultural or management resources.

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

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

Ongoing activities are undertaken on an annual basis or in response to an issue that arises.

This plan of management does not have a specific term and will stay in force and apply to any additions to Barayamal and Nullamanna national parks and Goonoowigall State Conservation Area, or until amended or replaced in accordance with the National Parks and Wildlife Act.

Table 6 List of management responses

Management response	Priority
3.1 Geology, landscape and catchments	
3.1.1 Undertake works in a manner that minimises erosion and water pollution.	Ongoing
3.1.2 Monitor erosion on the network of tracks and trails in the parks and undertake remedial actions as required.	Ongoing
3.1.3 Seek the transfer of the Crown reserve along Middle Creek to Goonoowigall State Conservation Area.	Low
3.2 Native plants	
3.2.1 Implement relevant actions in the *Biodiversity Conservation Program* for threatened plant species, populations and communities that occur in the parks.	High
3.2.2 Work with neighbours to encourage conservation of remnant native vegetation near the parks to link habitat with known wildlife corridors.	High
3.3 Native animals	
3.3.1 Implement relevant actions in the *Biodiversity Conservation Program* and recovery plans for threatened species and populations in the parks.	High
3.3.2 Undertake fauna surveys in each of the parks to gather baseline data on fauna species.	Ongoing
3.4 Aboriginal heritage	
3.4.1 Continue to consult and involve the Anaiwan Local Aboriginal Land Council, Goonoowigall Elders and other relevant Aboriginal community organisations and custodial families in the management of their Country, including the management of Aboriginal sites and places, and cultural and natural values.	Ongoing
3.4.2 Undertake an archaeological survey and cultural assessment before all works with the potential to impact Aboriginal and historic sites or values.	Ongoing

Management response	Priority
3.4.3 Encourage further research into the Aboriginal and historic heritage values of the parks.	Medium
3.4.4 Monitor the condition of Aboriginal sites and the Nhunta Karra Kara Track and implement appropriate protection measures as required.	High
3.4.5 Record Aboriginal and historic heritage sites, assess sites for heritage significance, and retain in situ.	Medium
3.4.6 Provide opportunities for Aboriginal people to access Country, to maintain, renew or develop cultural practices and associations.	Medium
3.5 Shared heritage	
3.5.1 Control vegetation around wooden hut footings to reduce fire risk.	Medium
3.5.2 Record historic sites and assess their significance.	Medium
3.5.3 Undertake an archaeological survey and cultural assessment prior to all works with the potential to impact historic sites and places.	Ongoing
3.6 Visitor use	
3.6.1 Maintain the management trail and walking track networks for the parks as shown on Figures 2, 4 and 5.	Ongoing
3.6.2 Public vehicle access is only permitted on Goonoowigall Road in Goonoowigall State Conservation Area.	Ongoing
3.6.3 Maintain Goonoowigall Day Use Area and the interpretation signs in Goonoowigall State Conservation Area.	Ongoing
3.6.4 Camping, campfires and dogs (dog walking) are not permitted in any of the parks.	Ongoing
Horse riding	
3.6.5 Allow horse riding along Ferndale Trail in Goonoowigall State Conservation Area and signpost accordingly. Horse riding is not permitted on any other tracks or trails in the state conservation area.	Ongoing
3.6.6 Horse riding is not permitted in Barayamal and Nullamanna national parks.	Ongoing
3.6.7 Camping with horses is not allowed in any of the parks.	Ongoing
3.6.8 Monitor the social and environmental impacts of horse riding, including erosion and weed impacts. Horse riding routes may be closed for rehabilitation where impacts are identified.	Ongoing
Cycling	
3.6.9 Allow cycling on Middle Creek Trail, Ferndale Trail and Sheep Station Creek Track in Goonoowigall State Conservation Area; and along Barayamal Trail in Barayamal National Park (as shown on Figures 2 and 4). Cycling will not be allowed on any other track or trail in the parks, including Nhunta Karra Kara Track and Thunderbolts Circuit in Goonoowigall State Conservation Area.	Ongoing
3.6.10 Manage Sheep Station Creek Bike Track as a cyclists-only mountain bike track and signpost accordingly.	
3.6.11 Install signs on the roads and trails in the parks where cycling is allowed.	Medium
3.6.12 Roads and trails may be closed to cycling where there is unacceptable environmental impact or risk to cyclists and other users.	Ongoing
3.6.13 Trails will be monitored and areas showing signs of unacceptable damage will be closed to cycling.	Low
4.1 Pests	

Management response	Priority
4.1.1 Continue weed control and pest animal control programs as outlined in pest management strategies relevant to the park.	High
4.1.2 Seek the cooperation of neighbours in implementing weed and pest control programs. Undertake control in cooperation with the Northern Tablelands Local Land Services, Landcare groups and neighbours.	Medium
4.1.3 Monitor priority weeds and their impacts. Treat any new outbreaks where possible.	Ongoing
4.1.4 Develop and implement boundary fencing agreements with neighbours where appropriate in accordance with NPWS policy.	Low
4.2 Fire	
4.2.1 Implement the fire management strategies for the parks and update as required.	High
4.2.2 Continue to be involved in the Northern Tablelands Bush Fire Management Committee and maintain cooperative arrangements with local Rural Fire Service brigades, other fire authorities (e.g. NSW Fire and Rescue and Forestry Corporation of NSW) and surrounding landowners regarding fuel management and fire suppression.	Ongoing
4.2.3 Suppress unplanned fires in the parks in accordance with the fire management strategies.	Ongoing
4.2.4 Manage the parks to protect biodiversity in accordance with the identified fire regimes in the fire management strategies.	Ongoing
4.2.5 Monitor the ability of flora to recover between fires and review regimes where relevant.	Medium
4.2.6 Rehabilitate areas disturbed by fire suppression operations as soon as practical after the fire.	Medium
4.3 Unauthorised vehicles	
4.3.1 Continue ongoing education programs to minimise unauthorised use of management trails by motorbike riders.	Medium
4.3.2 Monitor illegal motorbike use on management trails. Where required, install and maintain barriers and signage to reduce unauthorised use of management trails.	Medium
4.4 Isolation and fragmentation	
4.4.1 Maintain cooperative arrangements with nearby landholders regarding access, fire and pest species management.	Ongoing
4.4.2 Encourage protection and enhancement of native vegetation on public and private lands in the vicinity of the parks.	Medium
4.4.3 Liaise with neighbours, local council and Northern Tablelands Local Land Services to encourage the retention and appropriate management of key habitat and corridors adjacent to the parks.	Ongoing
4.5 Climate change	
4.5.1 Continue existing fire, pest and weed management and bushland restoration programs and adapt where required to minimise climate change-induced threats.	Ongoing
5.1 Management facilities and operations	
5.1.1 Maintain the network of park roads and management trails as shown on Figures 2, 4 and 5. Install gates and/or signs to prevent unauthorised public vehicle access to management trails where required.	Ongoing
5.1.2 Seek inclusion of the Ferndale Trail Crown road reserves into Goonoowigall State Conservation Area.	Medium

Management response	Priority
5.1.3 Continue to rehabilitate the former quarry using measures such as erosion control earthworks, rubbish removal, fencing of areas to allow for regeneration and weed control as appropriate.	Medium
5.2 Non-NPWS uses and operations	
5.2.1 Applications for mining or mineral exploration in the Goonoowigall State Conservation Area will be subject to environmental impact assessment and approvals.	Ongoing
5.2.2 Continue to liaise with TransGrid regarding access and maintenance needs in accordance with the agreement.	Ongoing
5.2.3 Continue to liaise with Essential Energy regarding access and maintenance needs in accordance with the protocol.	Ongoing

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Appendix 1. Vegetation communities in the parks

Comm. no.	Vegetation community [1]	Common names	Conservation status [2]
Goonoowigall SCA (Hunter 2008b)			
1	*Angophora floribunda – Eucalyptus macrorhyncha – Callitris endlicheri*	Rough-barked apple – red stringybark – black cypress pine	Not of conservation concern
2	*Callitris endlicheri – E. prava*	Black cypress pine – orange gum	Parts fall within McKies Stringybark / Blackbutt Open Forest EEC
3	*E. bridgesiana – Angophora floribunda – E. blakelyi*	Apple box – rough-barked apple – Blakely's red gum	Parts fall within White Box – Yellow Box – Blakely's Red Gum Grassy Woodland EEC (Grassy Box Gum Woodlands)
4	*E. blakelyi – Angophora floribunda*	Blakely's red gum – rough-barked apple	Falls within Grassy Box Gum Woodlands EEC
5	*E. prava – Callitris endlicheri*	Orange gum – black cypress pine	Not of conservation concern
6	*Leptospermum brachyandrum*	Weeping tea-tree	Probably rare and disjunct in the landscape but currently not thought to be of concern
7	*Leucopogon muticus – Homoranthus prolixus*	Blunt beard-heath – granite homoranthus	Falls within Howell Shrublands EEC
8	*E. blakelyi*	Blakely's red gum	Falls within Grassy Box Gum Woodlands EEC
Barayamal NP (Hunter 2008b)			
1	*E. blakelyi – E. melliodora*	Blakely's red gum	Falls within Grassy Box Gum Woodlands EEC
2	*E. viminalis – E. rubida – Angophora floribunda*	Ribbon gum – candlebark – rough-barked apple	Falls within Grassy Box Gum Woodlands EEC
3	*E. albens – E. melliodora*	White box – yellow box	Falls within Grassy Box Gum Woodlands EEC
4	*Dichanthium sericeum – Bothriochloa biloba*	Bluegrass	Falls within Grassy Box Gum Woodlands EEC
5	*E. albens – E. macrorhyncha*	White box – red stringybark	Unusual variant, rare in the landscape and the park
Nullamanna NP (Hunter 2008c)			
1	*E. dealbata*	Tumbledown red gum	Disjunct occurrences probably under threat from climate change, but currently not thought to be of concern

Comm. no.	Vegetation community [1]	Common names	Conservation status [2]
2	*E. dealbata – Callitris endlicheri*	Tumbledown red gum – black cypress pine	Not of conservation concern; well reserved across its range
3	*Angophora floribunda – Callitris endlicheri*	Rough-barked apple – black cypress pine	Not currently of conservation concern, probably adequately reserved across its range, though of limited spatial extent and generally in poor condition
4	*E. moluccana – Callitris endlicheri*	Grey box – black cypress pine	Not currently of conservation concern, though a unique combination of taxa
5	*E. sideroxylon – E. moluccana*	Mugga ironbark – grey box	Considered of conservation concern and potentially requiring listing as an endangered community

[1] Community description provided below.

[2] From Hunter 2008a, 2008b, 2008c.

Community descriptions

(Based on Hunter 2008a, 2008b, 2008c)

Howell Shrublands in the New England Tablelands and Nandewar Bioregions EEC

Usually dominated by low shrubs, particularly *Babingtonia densifolia* and granite homoranthus. Other shrubs, forbs and grasses also present. Species mix changes over time. Occasionally all shrubs absent, giving grassland structure, or various eucalypts and cypress pine (*Callitris glaucophylla*) may be present, giving a low open shrubby woodland structure.

Confined to areas of extensive granite outcropping.

White Box – Yellow Box – Blakely's Red Gum Woodland EEC

Woodland or derived native grassland with a ground layer of native grasses and herbs and a sparse scattered shrub layer. White box (*Eucalyptus albens*), yellow box (*E. melliodora*) or Blakely's red gum (*E. blakelyi*) dominate where the tree layer persists. In the Nandewar Bioregion, grey box trees (*E. macrocarpa* or *E. moluccana*) may also be dominant or co-dominant in the community.

McKies Stringybark / Blackbutt Open Forest EEC

Open forest characterised by the presence of McKie's stringybark (*E. mckieana*), New England blackbutt (*E. andrewsii*), and black cypress pine (*Callitris endlicheri*). Other tree species may also be present. A wide range of shrub and forb species make up the understorey.

White Box – Red Stringybark

Barayamal community 5. Grassy woodland with occasional shrub layer. Canopy characterised by white box (*E. albens*) and red stringybark (*E. macrorhyncha*). Kurrajong (*Brachychiton populneus*) may also be present. Ground layer is diverse. Community considered a transitional assemblage relative to soil type and aspect and is uncommon within the landscapes (Hunter 2008a).

Mugga Ironbark – Grey Box

Nullamanna community 5. Tall canopy layer dominated by mugga ironbark (*E. sideroxylon*) and grey box (*E. moluccana*) with black cypress pine (*Callitris endlicheri*) and narrow-leaved ironbark (*E. crebra*). Scattered shrub and understorey layer present.

Rough-barked Apple – Red Stringybark – Black Cypress Pine

Goonoowigall community 1 and Nullamanna community 3. Woodland or forest, often shrubby, that is widespread on the north-west slopes. Main canopy species are rough-barked apple (*Angophora floribunda*), red stringybark (*E. macrorhyncha*) and black cypress pine (*Callitris endlicheri*). Shrubs include *Acacia neriifolia*, *Acacia deani*, *Leptospermum brevipes* and *Leucopogon muticus*.

Black Cypress Pine – Orange Gum

Goonoowigall community 2 and community 5. The dominant community in Goonoowigall SCA covering 80% of the park with black cypress pine (*Callitris endlicheri*) and orange gum (*E. prava*) the main canopy species. *Leucopogon muticus*, *Brachyloma daphnoides*, *Leptospermum brevipes* and *Leucopogon melaleucoides* are the dominant shrubs and *Pomax umbellate*, *Cymbopogon refractus*, *Cheilanthes sieberi*, *Aristida ramose* and *Dichelachne micrantha* in the ground layer.

Weeping Tea-tree

Goonoowigall community 6. A restricted community in the central northern portion of the park with up to 70% tall shrub cover of *Leptospermum brachyandrum*, *Acacia neriifolia* and *Callistemon pungens*. A creek-line shrubland.

Tumbledown Gum – Black Cypress Pine

Nullamanna community 1 and community 2. The dominant community in Nullamanna NP, approximately 80% of the park with *E. dealbata* and *Callitris endlicheri* dominant canopy species. *Leucopogon muticus*, *Notelaea macrocarpa* and *Melichrus urceolatus* are the dominant shrubs and *Cymbopogon refractus*, *Cheilanthes sieberi* and *Austrodanthonia caespitosa* in the ground layer.

Grey Box – Black Cypress Pine

Nullamanna community 4. Community found associated with tributaries of the major drainage line in the northern half of the park with *E. moluccana* and *Callitris endlicheri* dominant canopy species. *Notelaea macrocarpa* and *Olearia elliptica* are the main shrubs with the grasses *Echinipogon caespitosus*, *Austrodanthonia caespitose* and *Aristida caput-medusae* in the ground layer.