



NSW NATIONAL PARKS & WILDLIFE SERVICE

Wondoba State Conservation Area

Plan of Management



Wondoba State Conservation Area Plan of Management

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This plan of management was adopted by the Minister for Energy and Environment on 22 August 2019.

Wondoba State Conservation Area is in the traditional Country of the Gamilaraay (Gomeroi) Aboriginal People.

This plan of management was prepared by staff of the Northern Plains Region and Park Strategy and Services Branch of the NPWS. For additional information or any inquiries about this plan of management or Wondoba State Conservation Area, contact the NPWS Coonabarabran Area Office at 30 Timor Street, Coonabarabran NSW 2450 or by telephone on (02) 6842 1311.

Published by:

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ISBN 978-1-922317-18-6

EES2019/0538

September 2019

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Contents

1.	Introduction.....	1
1.1	Location, reservation and regional setting.....	1
1.2	Statement of significance.....	1
2.	Management context.....	3
2.1	Legislative and policy framework.....	3
2.2	Management purposes and principles.....	3
2.3	Specific management directions.....	4
3.	Values.....	5
3.1	Geology, landscape and hydrology.....	5
3.2	Native plants.....	6
3.3	Native animals.....	7
3.4	Aboriginal heritage.....	8
3.5	Historic heritage.....	9
3.6	Visitor use, education and research.....	10
4.	Threats.....	12
4.1	Pests.....	12
4.2	Fire.....	13
4.3	Isolation and fragmentation.....	14
4.4	Climate change.....	14
5.	Management operations and other uses.....	16
5.1	NPWS management operations.....	16
5.2	Non-NPWS uses and activities.....	16
6.	Implementation.....	18
	References.....	21
 TABLES		
Table 1	Threatened animals recorded in Wondoba State Conservation Area.....	7
Table 2	New England north-west region climate change snapshot.....	15
Table 3	List of management responses.....	18

Wondoba State Conservation Area Plan of Management



Figure 1: Wondoba State Conservation Area

1. Introduction

1.1 Location, reservation and regional setting

Wondoba State Conservation Area (also called 'the park' in this plan) is located approximately 13 kilometres south-west of Gunnedah on the Wandobah Road. The park is 1669 hectares and has a boundary 26.6 kilometres in length. It falls across the Bundella and Mooki subcatchments of the Namoi Catchment area.

Wondoba State Conservation Area lies in the Liverpool Plains subregion of the Brigalow Belt South Bioregion (Thackway & Creswell 1995). Prior to being reserved as a state conservation area in December 2005, the park was managed by Forestry NSW (now the Forestry Corporation of NSW) as a commercial cypress pine forest and included grazing leases and gravel extraction pits. It is surrounded by private properties used for grazing and cropping.

Wondoba State Conservation Area lies within Gunnedah Local Government Area. It falls within the area of the Red Chief Local Aboriginal Land Council, and is part of the traditional lands of the Gamilaraay (Gomeri) Aboriginal people. The park is part of the Gomeri People Native Title Claim (NC2011/006).

Wondoba State Conservation Area is one of the parks established under the *Brigalow and Nandewar Community Conservation Areas Act 2005* (BNCCA Act) and as such forms part of a chain of parks stretching the length of the Brigalow Belt South Bioregion. It provides some connectivity in a highly cleared and fragmented landscape between privately owned uncleared country and smaller forested areas such as Goran State Forest. It provides a representative sample of the uncleared vegetation of the local area.

Access to Wondoba State Conservation Area is via the Wandobah Road from Gunnedah or via Beeson Road (also known as Hennessy Road) off the Oxley Highway to the north-west.

The park includes Milroy Road, about two-thirds of which is a 'Ministerial road' vested in the Minister under Part 11 of the *National Parks and Wildlife Act 1974* (NPW Act) to ensure continued access to neighbouring land. Additional Part 11 lands are located to the west of Wandobah Road and comprise the lands used under permit by the Namoi Valley Archers. These lands do not form part of the gazetted area of the park but their management is subject to this plan, the National Parks and Wildlife Regulation and the requirements of the *Environmental Planning and Assessment Act 1979* (EPA Act). Goscombe Road forms the southern boundary, and Milroy Road transects the park from the Wandobah Road through to Beeson Road.

1.2 Statement of significance

Wondoba State Conservation Area is considered significant for the following values:

Native plants

The park conserves remnants of the original vegetation of the Liverpool Plains. It supports 262 vascular plant taxa from 66 families and 178 genera.

Four plant communities have been identified in the park. One of these contains components of the White Box – Yellow Box – Blakely's Red Gum Endangered Ecological Community listed under the *Biodiversity Conservation Act 2016* (BC Act) and the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands community which is listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Native animals

A total 86 species of native fauna have been recorded within the park including 61 birds, 12 reptiles, 11 mammals and two amphibians. Eight of these species are listed as vulnerable under the BC Act.

Aboriginal heritage

The park protects over 20 known Aboriginal cultural heritage sites, with potentially more sites yet to be found. The park also provides an important connection to Country for the local Aboriginal community.

2. Management context

2.1 Legislative and policy framework

The management of the community conservation area is in the context of the legislative and policy framework of the NSW National Parks and Wildlife Service (NPWS), primarily the NPW Act and Regulation, the Community Conservation Area Agreement developed under the BNCCA Act, the BC Act and NPWS policies.

Other legislation, strategies and international agreements may also apply to management of the area. In particular, the EPA Act 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 EPBC Act 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 NPW Act. Once the Minister has adopted a plan, the plan must be carried out and no operations may be undertaken within Wondoba State Conservation Area except in accordance with the plan. This plan will also apply to any future additions to Wondoba State Conservation Area. 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

The BNCCA Act identifies Wondoba State Conservation Area as a zone 3 community conservation area. Community conservation areas are established under the BNCCA Act. This Act provides for four dedicated management zones of which zones 1, 2 and 3 relate to land reserved under the NPW 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 NPW Act.

Zone 3 state conservation areas

Zone 3 community conservation areas are reserved under the NPW Act to protect and conserve areas that:

- contain significant or representative ecosystems, landforms or natural phenomena or places of cultural significance
- that are capable of providing opportunities for sustainable visitor 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 NPW Act, Zone 3 community conservation areas are therefore 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 NPW 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 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 reuse) 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 where mineral values do not allow for reservation as another category. The NPW Act requires a review of the classification of state conservation areas every five years in consultation with the Minister administering the *Mining Act 1992*. Reviews were undertaken in 2008 and 2013 in which the status of Wondoba State Conservation Area remained unchanged.

Subject to the outcome of future reviews, in the long term it is intended that Wondoba State Conservation Area becomes a national park, therefore management of the state conservation area will also be guided by the management principles for national parks as far as possible.

2.3 Specific management directions

In addition to the general principles for the management of state conservation areas (see Section 2.2), the management of Wondoba State Conservation Area will focus on the protection of the significant vegetation communities, threatened native animals and Aboriginal heritage sites.

Major strategies to achieve these objectives are:

- Ongoing fire management to protect people and property from wildfire, and to maintain park values.
- Ongoing control of pest species to minimise their impact on park values, particularly the impact of Coolatai grass.
- Protect cultural heritage places with the involvement of the community, in particular the local Aboriginal community.
- Provide opportunities for recreation activities that are consistent with the protection of the natural and cultural values of the park.

3. Values

The location, landforms and plant and animal communities of an area have determined how it has been used and valued. Both Aboriginal and non-Aboriginal people place values on natural areas, including aesthetic, social, spiritual and recreational values. These values may be attached to the landscape as a whole or to individual components, for example 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, various aspects of natural heritage, cultural heritage, threats and ongoing use are dealt with individually, but their interrelationships are recognised.

Wondoba State Conservation Area is a significant park within the Northern Plains region as it protects a representative sample of the flora and fauna of a region that is now mainly cleared of its original woodlands and forests. This is particularly important for woodland birds and other native animals as it provides refuge and habitat for these species.

3.1 Geology, landscape and hydrology

Located in the Liverpool Plains subregion of the Brigalow Belt South Bioregion, Wondoba State Conservation Area is composed of undulating country with a series of peaks and gullies (ranging between 520 metres and 390 metres above sea level) with a general fall towards the south-west corner of the park. A series of tributaries drain from the higher areas of the park and enter two separate creek lines that flow to the south-west and eventually towards the Goran basin.

The geology of the park is predominantly composed of Triassic lithic sandstones, silty sandstone, mudstones and conglomerates of the Narrabeen Group, Digby Conglomerate.

Upper Permian sandstone, shale, conglomerate, chert, coal and limestone of the Black Jack Formation, which were formed as part of a delta system that emptied out to a shallow marine shelf, underlie the westward flowing drainage depressions. Tertiary basalts and dolerite volcanics occur at the north-east edge of the park while Quaternary clay, silt, sands and gravel deposited by alluvial processes occur at the lower elevations in the south-west of the park along creek lines (Geological Survey of NSW & University of New England 1971).

Soils range from moist to well-drained and occasionally skeletal on the crests and upper rocky slopes, to moist and deep with a loamy texture on the lower to mid slopes (Hunter 2008).

Issues

- There are potential soil erosion issues where small creeks intersect the park's trails or where water lies on track surfaces. Unauthorised use of these trails by four-wheel vehicles and trail bikes (particularly when wet) may result in significant damage to the trail surfaces. Without remedial action this could make the trails inaccessible to vehicles required for firefighting.

Desired outcome

- Soil erosion is minimised.
- Management trails are accessible.

Management response

- 3.1.1 Undertake all works in a manner that minimises erosion, the movement of sediment and water pollution. Assess trails and take action to mitigate erosion.

3.2 Native plants

A total of 262 vascular plants are known to occur in the park (Hunter 2008). Although no threatened plant species have been found during surveys in the park, less shrubby areas of the White Cypress Pine – White Box Woodland meet the description of the White Box – Yellow Box – Blakely's Red Gum endangered ecological community which is listed under the BC Act. This community is also a listed threatened community under the EPBC Act, as White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands.

In the park, 14% of species are non-native. They are mostly found in previously disturbed areas such as the park boundaries and along the trail network. Of particular concern is the presence of the weed species Coolatai grass (*Hyparrhenia hirta*) in the White Cypress Pine – White Box Woodland. This grass has the potential to spread into all communities in the park (see Section 4.1). Invasion of native plant communities by exotic perennial grasses is listed as a key threatening process under the BC Act (NSW SC 2003).

Four plant communities occur within the park. They are listed and summarised below:

- White Cypress Pine – White Box Woodland
- White Box – Narrow-leaved Ironbark Woodland
- Narrow-leaved Ironbark – White Cypress Pine – Black Cypress Pine Woodland
- Black Cypress Pine – Narrow-leaved Ironbark Woodland.

White Cypress Pine – White Box Woodland

This low open, occasionally shrubby woodland community is commonly found on the lower to mid slopes and covers approximately 50% of the park. Tree species include the community dominants, white cypress (*Callitris glaucophylla*) and white box (*Eucalyptus albens*), plus rough-barked apple (*Angophora floribunda*), Blakely's red gum (*E. blakelyi*), yellow box (*E. melliodora*), narrow-leaved ironbark, kurrajong (*Brachychiton populneus*), and black cypress pine (*Callitris endlicheri*). Shrubby understorey species typically include sticky hop-bush (*Dodonaea viscosa* var. *angustifolia*), oncino burr (*Ocinoxalyx betchei*), native olive (*Notelaea microcarpa*), poison rice-flower (*Pimelea neo-anglica*), and wilga (*Geijera parviflora*).

White Box – Narrow-leaved Ironbark Woodland

This community comprises low shrubby woodland and is found on the mid slopes of the park on soils ranging from deep and moist to skeletal sandy loams. It occurs only in isolated patches, generally where a higher level of past human impact has occurred. The shrub component is typically composed of sticky daisy-bush (*Olearia elliptica*), sticky hop-bush, sticky wallaby-bush (*Beyeria viscosa*), wilga, native olive, berrigan (*Pittosporum angustifolium*), curracabah (*Acacia leiocalyx*) and western silver wattle (*A. decora*). While heavily grazed and logged in the past, as evidenced by some areas of erosion and loss of soil structure, these areas are regenerating naturally.

Narrow-leaved Ironbark – White Cypress Pine – Black Cypress Pine Woodland

This shrubby, low woodland covers 45% of the park and occurs mainly on the upper slopes and rocky ridgelines. The main dominants plus white box, dirty gum (*E. chloroclada*) and yellow box comprise the tree layer. Shrubs include hoary guinea flower (*Hibbertia obtusifolia*), native olive, urn-heath (*Melichrus urceolatus*), sticky hop-bush, oncino burr, grass tree (*Xanthorrhoea johnsonii*) and green wattle (*A. deanei*).

Black Cypress Pine – Narrow-leaved Ironbark Woodland

This strongly layered, low woodland community is found scattered throughout the higher slopes and crests of the park and is particularly associated with shallow soils and/or rocky ridge lines.

Tree species include the two main species and dirty gum, tumbledown red gum (*E. dealbata*), white cypress pine and motherumbah (*A. cheelii*). The shrub layer is typified by urn-heath, cough bush/dead finish (*Cassinia laevis*), small-leaf bush-pea (*Pultenaea foliolosa*) and sticky hop-bush.

Strategies for the recovery of threatened plants and ecological communities have been set out in a statewide *Biodiversity Conservation Program* (formerly known as the *Threatened Species Priorities Action Statement* [DECC 2007]). 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).

Issue

- A long history of forestry and silviculture practices has resulted in significant changes to the structure, diversity and distribution of native vegetation communities. Since those practices ceased with creation of the park, thickets of cypress pine regrowth have developed. Habitat components such as large hollow-bearing trees will have been reduced and will take many years to regenerate.

Desired outcomes

- All native plant and animal species and communities are conserved. Key threatening processes are reduced.
- Structural diversity and habitat values are maintained or improved.

Management response

3.2.1 Undertake systematic biodiversity surveys to enhance the knowledge of plants and vegetation communities in the park.

3.2.2 Implement relevant actions from *Biodiversity Conservation Program* for threatened species, populations and ecological communities in the park.

3.3 Native animals

A total 86 species of native animals have been recorded within Wondoba State Conservation Area including 61 birds, 12 reptiles, 11 mammals and two amphibians (OEH 2016a). Of these, eight are listed as vulnerable under the BC Act (see Table 1) and two species are listed under the EPBC Act.

Table 1 Threatened animals recorded in Wondoba State Conservation Area

Common name	Scientific name	EPBC Act	BC Act
Birds			
Little lorikeet	<i>Glossopsitta pusilla</i>		Vulnerable
Brown treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>		Vulnerable
Speckled warbler	<i>Chthonicola sagittata</i>		Vulnerable
Grey-crowned babbler (eastern subspecies)	<i>Pomatostomus temporalis temporalis</i>		Vulnerable
Varied sittella	<i>Daphoenositta chrysoptera</i>		Vulnerable
Dusky woodswallow	<i>Artamus cyanopterus cyanopterus</i>		Vulnerable
Mammals			

Common name	Scientific name	EPBC Act	BC Act
Koala	<i>Phascolarctos cinereus</i>	Vulnerable	Vulnerable
Corben's long-eared bat	<i>Nyctophilus corbeni</i>	Vulnerable	Vulnerable

Source: BioNet (OEH 2017).

Being listed as vulnerable species means that these animals are likely to become endangered unless the circumstances and factors threatening their survival or evolutionary development cease to operate (OEH 2016b).

Strategies for the recovery of threatened animal species and populations have been set out in a statewide *Biodiversity Conservation Program* (formerly known as the *Threatened Species Priorities Action Statement* [DECC 2007]). 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).

Issues

- The park provides habitat for at least 10 threatened species. The *Biodiversity Conservation Program* and recovery plans contain strategies for the recovery of threatened species.
- There is potential to gain a fuller understanding of the fauna values of the park. The Northern Plains Region Biodiversity Monitoring Strategy (DECC 2009) provides a framework for monitoring.

Desired outcomes

- All native plant and animal species and communities are conserved. Key threatening processes are reduced.
- Structural diversity and habitat values are maintained or improved.

Management response

3.3.1 Undertake systematic biodiversity surveys to enhance the knowledge of native animals and habitats in the park.

3.3.2 Implement the relevant actions from the *Biodiversity Conservation Program* for threatened species and populations recorded in the park.

3.4 Aboriginal heritage

The Wondoba State Conservation Area lies within the traditional Country of the Gamilaraay People. 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.

Wondoba State Conservation Area falls within the area of Red Chief Local Aboriginal Land Council.

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. Over 20 cultural sites have been recorded within the park. Cultural heritage surveys were conducted in November 2007 and March 2008 by members of the Red Chief Local Aboriginal Land Council, Min Min Aboriginal Corporation,

Gunida Gunya Aboriginal Corporation and NPWS staff (RCLALC 2008). The cultural sites found include artefact scatters, grinding groove sites and modified trees. The park is part of the Gomeri People Native Title Claim (NC2011/006).

Many plant species growing in the park, such as grass tree and buck spinifex, were potentially used as food or medicinal plants or for making tools and utensils (Hunter 2008). Cultural use of wild resources, such as medicinal plants and bush tucker, is subject to NPWS policies and licensing.

While the NSW Government has legal responsibility for the protection of Aboriginal sites and places, the NPWS acknowledges the right of Aboriginal people to make decisions about their own heritage. Aboriginal communities are consulted and involved in managing Aboriginal sites, places and related issues, and promoting and presenting Aboriginal culture and history.

Issues

- There are 20 recorded Aboriginal sites on the park and more may be present.
- Little is known about contemporary Aboriginal use of the area. Aboriginal people have expressed an interest in continuing involvement in management of the park, including continued youth training opportunities.

Desired outcomes

- Aboriginal cultural features and values are identified and protected.
- Aboriginal people are involved in managing the Aboriginal cultural values in the park.

Management response

- 3.4.1 Undertake an assessment for cultural sites and features before any ground disturbance work in the park.
- 3.4.2 Consult and involve the Red Chief Local Aboriginal Land Council and other relevant Aboriginal community organisations in protecting and managing Aboriginal sites, places and values, and interpreting places or values.
- 3.4.3 Work cooperatively with Aboriginal people to provide for access to Country for cultural purposes such as culture camps and the sharing of traditional knowledge.

3.5 Historic heritage

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

No historic sites have been recorded within Wondoba State Conservation Area.

The Wondoba Parish map of 1883 shows land marked as the 'Wondobar Run' under lease to Edward Henry Keen in 1886 (LPI 2016).

In the late 1880s, parts of the land now included in the park were reserved from sale for the preservation of timber and for use as a travelling stock route. In 1894 the area immediately to the north of the park was set aside for coalmining, and in 1895 the road reserve along Milroy Road was gazetted and construction of the road was completed in 1904. A section of the

original travelling stock route (which now forms the eastern boundary of the park along Wandobah Road, see Figure 1) was in use until the 1920s.

In 1912 the area of the park excluding the travelling stock route was declared a Forestry Reserve (No. 25859). This meant that the area was reserved for the preservation and growth of timber. From 1915 to 1925 further portions of land were added to the Forestry Reserve and the area later converted to Wondoba State Forest No. 196.

Evidence of former forestry practices can be found throughout the park in the form of snigging tracks and many cypress and ironbark tree stumps. The park, particularly the lower slopes, has been used for livestock grazing in the past. Two former gravel extraction sites are also noted on old parish maps (LPI 2016).

Issues

- No historic sites have been recorded in the park but there are various sites of former land use including an old gravel quarry, snig tracks and tree stumps from past forestry operations.
- As with other former state forests, blazed survey trees may occur in the park indicating forestry coups or boundary markers.

Desired outcome

- Historic heritage features and values are identified and protected.

Management responses

3.5.1 Determine the significance of any historic heritage items found in the park.

3.5.2 Record any blazed survey trees and other items of historical heritage found in the park, and protect them from damage as far as possible.

3.6 Visitor use, education and research

The primary public access for visitors to Wondoba State Conservation Area is via the entrance off Wandobah Road to the carpark (see Figure 1). Public vehicles are not permitted on management trails within the park.

As a former state forest close to Gunnedah, the park has historically been used by the local community for various activities such as firewood collection, four-wheel driving and trail bike riding. These activities were previously permitted under Forests NSW (now the Forestry Corporation of NSW) management but are now not permitted in the state conservation area. Signs at the main access points indicate the activities that are permissible in the park.

While there are currently no visitor facilities in the park, Wondoba State Conservation Area supports nature-based recreation such as bushwalking, cycling and horse riding along management trails. Wondoba State Conservation Area has also been used from time to time for educational purposes, including cultural heritage survey training for members of the local Aboriginal community. The Namoi Valley Archers are also permitted to practice archery within the area indicated on Figure 1 (see also Section 5.2).

Recent research activities within Wondoba State Conservation Area include biodiversity and cultural surveys conducted by NPWS and community groups to better understand the natural and cultural values of the park.

Unauthorised activities such as pig hunting, four-wheel driving and trail bike riding threaten park values by causing erosion on trails and in adjacent bushland. Illegal cutting of firewood is also a

serious problem in the park, including removal of standing trees and coarse woody debris, both important habitat components.

Issues

- Illegal access and activities are having negative impacts on park values. Promoting understanding and appreciation of the park's conservation values is important for minimising damaging activities and maximising visitor enjoyment.

Desired outcome

- Visitor use is ecologically sustainable.
- Low-impact recreational activities in the park are supported.
- Visitors understand the park's values.
- Visitors have an appreciation of park values and conservation issues.

Management response

- 3.6.1 Provide public vehicle access off Wandobah Road. Maintain the existing carpark and construct a low-key picnic area at the park entrance.
- 3.6.2 Permit camping in the park with prior consent from NPWS.
- 3.6.3 Allow cycling and horse riding on the park's management trail network. Cycling and horse riding is not permitted off management trails.
- 3.6.4 Monitor levels and impacts of cycling and horse riding. Where significant or ongoing impacts from horse riding or cycling are identified, conditions on group size, locations and conditions for horse riding and/or cycling will be considered.
- 3.6.5 Develop interpretative signage and other material for visitors and other stakeholders which provide information about park values and park management.
- 3.6.6 Permit organised group recreational and educational visits, subject to limits on numbers and other conditions if necessary to minimise impacts.
- 3.6.7 Organise media releases, educational material and contact with neighbours and community organisations based on park management issues.

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.

NPWS prepares pest management strategies which identify pest species and priorities for control, including actions listed in the *Biodiversity Conservation Program* (see Sections 3.3 and 3.4), threat abatement plans, and other strategies such as the NSW *Biodiversity Priorities for Widespread Weeds* (NSW DPI & OEH 2011) and the *NSW Biosecurity Strategy 2013–2021* (DPI 2013).

The NPWS pest management strategy (OEH 2012) identifies pest species and priority programs for Wondoba State Conservation Area. The overriding objective of the pest management strategy is to minimise adverse impacts of introduced species on biodiversity and other park and community values while complying with legislative responsibilities. The strategy also identifies where other site- or pest-specific plans or strategies are needed to provide a more detailed approach.

Pest animals

Rabbits (*Oryctolagus cuniculus*), feral pigs (*Sus scrofa*) and cats (*Felis catus*) occur in isolated populations restricted to small areas, while foxes (*Vulpes vulpes*) are widespread throughout the park. Each of these pest species is listed as a key threatening process under the BC Act (NSW SC 2002, 2004b, 2000c & 1998 respectively) and under the EPBC Act (DoE 2009 & TSSC 2001b in the case of feral pigs).

Low densities of deer (*Cervus* spp.) are also known to occur occasionally within the park. They are a transient population, moving in and out of the park. Control of deer is difficult due to a lack of effective and efficient control techniques. Deer are also listed as a key threatening process under the BC Act (NSW SC 2004a).

Cooperative pig trapping programs have been undertaken with neighbours, and a winter fox baiting program has been running in the park since 2006.

Weeds

The *Biosecurity Act 2015* and regulations provide specific legal requirements for the prevention, eradication or containment of state level priority weeds. These requirements apply equally to both public and privately owned land. A regional strategic weed management plan prepared under the *Biosecurity Act 2015* identifies those pest plants that are being prioritised for management action, investment and compliance effort within the North West Local Land Services region (North West LLS 2017). These priorities will be implemented via the relevant NPWS pest management strategy.

Scattered infestations of tree pear (*Opuntia tomentosa*) and prickly pear (*Opuntia stricta*) have been recorded in the park. These weeds are controlled by spraying at appropriate times. Biological control agents such as cactoblastis or cochineal may also be applied in the park to control these species. Thistles and other weeds occur along the edges of management trails and park boundaries where the level of disturbance by vehicles and feral animals is greatest.

Coolatai grass has been recorded in the reserve within the White Box – White Cypress Pine community (Hunter 2008). Coolatai grass was introduced to north–west NSW and has now become a significant weed problem in grassy woodlands, along roadsides and travelling stock routes where it can displace native grasses, even in situations where grazing by livestock has

been limited or non-existent. The density of the grass swards can preclude almost all native species and even affect eucalyptus germination and establishment, and the nutritional and moisture uptake by mature trees. Coolatai grass supports rapid combustion during wildfires and germinates readily afterwards (Hunter 2008). Coolatai grass is one of several exotic grasses listed as a key threatening process under the BC Act (NSW SC 2003). Infestations of Coolatai grass in the park are treated by spraying.

Desired outcome

- The impact of introduced species on native species and neighbouring lands is minimised.
- Small and isolated pest populations are controlled.

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 Monitor the park for state level and regional level priority weeds, significant environmental weeds and emerging weeds and treat any new outbreaks.
- 4.1.3 Work cooperatively with North West Local Land Services, Gunnedah Shire Council and neighbours in implementing coordinated weed and pest animal control programs.

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 the loss of particular plant and animal species and communities, and high frequency fires have been listed as a key threatening process under the BC Act (NSW SC 2000b).

There is little evidence of fire scars from past wildfire events. The only known wildfire occurred in 2014 when 130 hectares burnt from a suspected arson ignition. Prior to this wildfire, the park was long unburnt. The majority of the park has been assessed as having only low surface and near-surface fuel levels though a higher fire potential will occur seasonally in areas with a grassy understorey.

A fire management strategy which defines the fire management approach for the park has been prepared (OEH 2013c). The fire management strategy outlines the key assets within and adjoining Wondoba State Conservation Area including sites of natural and cultural heritage value, fire management zones and fire control advantages such as management trails and water supply points. It also contains fire regime guidelines for conservation of the park's vegetation communities. Hazard reduction programs will be conducted in accord with fuel levels within the park as outlined in the fire management strategy.

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

Desired outcomes

- Life, property and natural and cultural values are protected from bushfire.
- Fire regimes are appropriate for conservation of plant and animal communities.
- Natural and cultural features are protected from damage by fire.
- Stakeholders participate in fire management planning.

Management response

- 4.2.1 Manage wildfires in accordance with the fire management strategy for the park and update the strategy as required.
- 4.2.2 Undertake prescribed burns to maintain ecological values as outlined in the fire management strategy.
- 4.2.3 Continue to participate in the Liverpool Range Bush Fire Management Committee. Maintain coordination and cooperation with the Rural Fire Service brigades and neighbours with regard to fuel management and fire suppression.

4.3 Isolation and fragmentation

The area surrounding Wondoba State Conservation Area has been extensively cleared in the past, which has resulted in a high loss of biodiversity and fragmentation of habitat in the region. 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 contribute to the habitat values of the park and provide ecological corridors to other vegetated areas. Maintaining the integrity of the remaining habitat within the park and, where possible, linking this to adjacent areas of vegetation to facilitate wildlife corridors is important in ensuring long-term viability of the park's biological values.

The park is located in a highly cleared and fragmented landscape and exists as an 'island' refuge.

Only 25% of the park's boundary has a native vegetation buffer, the remainder being cleared agricultural land. As such it is important that any native vegetation buffers be preserved.

Desired outcome

- Connectivity of the park with local woodland remnants is enhanced to allow native animal movement.
- A buffer of native vegetation on adjoining land is conserved where it exists.

Management response

- 4.3.1 Work with neighbours and North West Local Land Services to encourage conservation of remnant native vegetation in the vicinity of the park.

4.4 Climate change

Human-induced climate change is listed as a key threatening process under the BC Act (NSW SC 2000a) and habitat loss caused by human-induced greenhouse gas emissions is listed under the EPBC Act (TSSC 2001a).

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 2020–39 are described as 'near future' (or as 2030) and projections for 2060–79 are described as 'far future'

(or as 2070). The snapshot shown in Table 2 is for the New England north–west region which includes Wondoba State Conservation Area.

Table 2 New England north–west region 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 (i.e. > 35°C) will increase	The number of cold nights (i.e. < 2°C) 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 in summer, spring and winter	Severe fire weather days are projected to increase in summer and spring

Source: OEH 2014.

Climate change may significantly affect biodiversity by changing the size of populations and the distribution of species, and altering the geographical extent of habitats and ecosystems. The likelihood of these changes occurring is difficult to assess since it depends on the compounding effects of other pressures, particularly barriers to migration and pressure from feral animals. Species most at risk are those unable to migrate or adapt, particularly those with small population sizes or with slow growth rates.

Heavily cleared and fragmented ecosystems in the New England north–west region are likely to be at greater risk than more intact ecosystems. Climate change may add yet another pressure on these already highly stressed ecosystems. Warmer conditions are likely to favour weed species which could increase in abundance and continue to alter the mix of species in understorey vegetation. More frequent fire is also possible with increasing temperatures, hastening the death of large, mature trees on which many native animals depend for nesting and roosting (OEH 2011a).

In Wondoba State Conservation Area the type of vegetation, namely dry sclerophyll woodland, is able to tolerate a wide range of climatic conditions and is, therefore, likely to be more resilient than other ecosystems. Programs to reduce the pressures arising from other threats, such as habitat fragmentation, invasive species and bushfires, will help reduce the severity of the effects of climate change.

Desired outcome

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

Management response

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

5. Management operations and other uses

5.1 NPWS management operations

NPWS maintains a network of management trails in Wondoba State Conservation Area for park management purposes including pest control and fire operations. Public vehicles are not permitted on management trails within the park, unless under consent, but visitors are allowed to use management trails for walking, cycling and horse riding.

The park is traversed by Milroy Road, a public road maintained by Gunnedah Shire Council. About two-thirds of the formed road within the park is not within the legal road reserve, and for this reason, is Part 11 land vested in the Minister under the NPW Act so as to maintain access for users of the road, including neighbouring landholders. The road reserve will need to be realigned to align with the formed road.

There are three dams in the park which are used for fire and pest management operations.

The majority of the park boundary is fenced to exclude stock from adjoining properties but straying stock are occasionally found in the park.

Desired outcomes

- Management facilities serve management needs and have minimal impact on park values.
- Firefighting capacity is maximised within the park's existing resources.

Management response

5.1.1 Maintain all management trails within the park according to the fire management strategy.

5.1.2 Seek to have the road reserve for Milroy Road realigned with the formed road.

5.1.3 Retain firefighting water supplies and maintain them as required.

5.1.4 Maintain boundary fences to exclude domestic stock from the park in conjunction with park neighbours. As required, enter into fencing agreements with neighbouring landowners in accordance with the NPWS Boundary Fencing Policy.

5.2 Non-NPWS uses and activities

Namoi Valley Archers

The Namoi Valley Archers have over 20 years' history of non-exclusive use of an area of land now within Wondoba State Conservation Area. With the creation of Wondoba State Conservation Area under the BNCCA Act in 2005, a parcel of land approximating the area under occupational permit by Forests NSW (now the Forestry Corporation of NSW) was excluded from the park reservation to allow this existing interest to continue.

Namoi Valley Archers club operates under an occupation permit (no. 2542). The permit covers the land that is vested in the Minister responsible for administering the NPW Act under Part 11. (see Figure 1). This allows the club's continued use of the land for field archery. The Namoi Valley Archers typically use the range two Sundays a month for club events and periodically for competition events. The club has exclusive use of the permit area only during event times. Other conditions of use, such as warning signage on public access roads, notification to NPWS of events and use of portable toilets, are included within the permit.

Travelling stock reserves

Travelling stock reserves adjoin the park on its southern and eastern boundaries. They have not been used for moving stock in many years. Fencing on the shared boundaries is in poor condition and untreated weed infestations are spreading into the park in some locations. Rubbish dumping in the travelling stock reserves is also an issue.

Travelling stock reserves are Crown land managed by Local Land Services, which is undertaking a statewide review to determine the future ownership and management arrangements of these lands. This could include transfer to other agencies, local councils or local Aboriginal land councils. There may be potential for a future addition to Wondoba State Conservation Area on completion of the review. Travelling stock reserves can contribute to the conservation of native vegetation and habitat values in agricultural landscapes by protecting the seedbank of native species and retaining canopy trees. However, where heavily used, continuous grazing of travelling stock reserves can erode their conservation values.

Mining and exploration

Exploration for minerals and petroleum, as well as mining and petroleum production, are permissible uses within state conservation areas. Wondoba State Conservation Area is underlain by coal and petroleum titles in an area of active mining and high potential for coal seam gas.

The coal title (EL 7241) covers some 2575 square kilometres and is held the Department of Planning, Industry and Environment (Resources and Energy) on behalf of the Crown. The petroleum title (PEL 1) is held by Australian Coalbed Methane Pty Ltd. Both titles have been renewed several times. As long as the titles are in place the park will remain a state conservation area to allow for exploration or mining, subject to environmental assessment.

The Department of Planning, Industry and Environment (Resources and Energy) is the lead authority for mining and petroleum activities, including mineral exploration and mine site rehabilitation. The Department will ensure that exploration and production proposals in state conservation areas comply with all statutory requirements, including any necessary environmental impact assessments and approvals.

Desired outcomes

- Field archery is allowed to continue under permit and the area of use is correctly defined as Part 11 land.
- Mining and mineral exploration activities have minimal impact on natural and cultural values.

Management response

- 5.2.1 Allow recreational and competition field archery activities to continue within the area specified by amended occupational permit no. 2542, subject to compliance with the listed conditions.
- 5.2.2 Work cooperatively with North West Local Land Services to address weed, rubbish dumping and other issues in the travelling stock reserves adjoining the park.
- 5.2.3 Ensure applications for mining or mineral exploration in the state conservation area are subject to environmental impact assessment and approvals.

6. Implementation

This plan of management establishes a scheme of operations for the Wondoba State Conservation Area.

Identified activities for implementation are listed in the table below. Relative priorities are allocated against each activity as follows:

- **High priority** activities are imperative to achieve the objectives and desired outcomes 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 but are not urgent.
- **Low priority** activities are desirable to achieve management 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 until amended or replaced in accordance with the NPW Act.

Table 3 List of management responses

Plan reference	Management response	Priority
3.1 Geology, landscape and hydrology		
3.1.1	Undertake all works in a manner that minimises erosion, the movement of sediment and water pollution. Assess trails and take action to mitigate erosion.	Ongoing
3.2 Native plants		
3.2.1	Undertake systematic biodiversity surveys to enhance the knowledge of plants and vegetation communities in the park.	Medium
3.2.2	Implement relevant actions from the <i>Biodiversity Conservation Program</i> for threatened species, populations and ecological communities in the park.	Medium
3.3 Native animals		
3.3.1	Undertake systematic biodiversity surveys to enhance the knowledge of native animals and habitats in the park.	Medium
3.3.2	Implement the relevant actions from the <i>Biodiversity Conservation Program</i> for threatened species and populations recorded in the park.	Medium
3.4 Aboriginal heritage		
3.4.1	Undertake an assessment for cultural sites and features before any ground disturbance work in the park.	High
3.4.2	Consult and involve the Red Chief Local Aboriginal Land Council and other relevant Aboriginal community organisations in protecting and managing Aboriginal sites, places and values, and interpreting places or values.	Medium

Wondoba State Conservation Area Plan of Management

Plan reference	Management response	Priority
3.4.3	Work cooperatively with Aboriginal people to provide for access to Country for cultural purposes such as culture camps and the sharing of traditional knowledge.	Ongoing
3.5 Historic heritage		
3.5.1	Determine the significance of any historic heritage items found in the park.	Medium
3.5.2	Record any blazed survey trees and other items of historical heritage found in the park, and protect them from damage as far as possible.	Medium
3.6 Visitor use, education and research		
3.6.1	Provide public vehicle access off Wandobah Road. Maintain the existing carpark and construct a low-key picnic area at the park entrance.	Medium
3.6.2	Permit camping in the park with prior consent from NPWS.	High
3.6.3	Allow cycling and horse riding on the park's management trail network. Cycling and horse riding is not permitted off management trails.	Medium
3.6.4	Monitor levels and impacts of cycling and horse riding. Where significant or ongoing impacts from horse riding or cycling are identified, conditions on group size, locations and conditions for horse riding and/or cycling will be considered.	Medium
3.6.5	Develop interpretative signage and other material for visitors and other stakeholders which provide information about park values and park management.	Low
3.6.6	Permit organised group recreational and educational visits, subject to limits on numbers and other conditions if necessary to minimise impacts.	Medium
3.6.7	Organise media releases, educational material and contact with neighbours and community organisations based on park management issues.	Low
4.1 Pests		
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	Monitor the park for state level and regional level priority weeds, significant environmental weeds and emerging weeds and treat any new outbreaks.	Medium
4.1.3	Work cooperatively with North West Local Land Services, Gunnedah Shire Council and neighbours in implementing coordinated weed and pest animal control programs.	High
4.2 Fire		
4.2.1	Manage wildfires in accordance with the fire management strategy for the park and update the strategy as required.	High
4.2.2	Undertake prescribed burns to maintain ecological values as outlined in the fire management strategy.	High
4.2.3	Continue to participate in the Liverpool Range Bush Fire Management Committee. Maintain coordination and cooperation with the Rural Fire Service brigades and neighbours with regard to fuel management and fire suppression.	Medium

Wondoba State Conservation Area Plan of Management

Plan reference	Management response	Priority
4.3 Isolation and fragmentation		
4.3.1	Work with neighbours and North West Local Land Services to encourage conservation of remnant native vegetation in the vicinity of the park.	Low
4.4. Climate change		
4.4.1	Continue existing fire, pest and weed management programs and adapt them where required to minimise climate change-induced threats.	Medium
5.1 NPWS management operations		
5.1.1	Maintain all management trails within the park according to the fire management strategy.	Medium
5.1.2	Seek to have the road reserve for Milroy Road realigned with the formed road.	Medium
5.1.2	Retain firefighting water supplies and maintain them as required.	Medium
5.1.3	Maintain boundary fences to exclude domestic stock from the park in conjunction with park neighbours. As required, enter into fencing agreements with neighbouring landowners in accordance with the NPWS Boundary Fencing Policy.	High
5.2 Non-NPWS uses and activities		
5.2.1	Allow recreational and competition field archery activities to continue within the area specified by amended occupational permit no. 2542, subject to compliance with the listed conditions.	High
5.2.2	Work cooperatively with North West Local Land Services to address weed, rubbish dumping and other issues in the travelling stock reserves adjoining the park.	Medium
5.2.3	Ensure applications for mining or mineral exploration in the state conservation area are subject to environmental impact assessment and approvals.	High

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Wondoba State Conservation Area Plan of Management

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