



NSW NATIONAL PARKS & WILDLIFE SERVICE

Trinkey State Conservation Area

Plan of Management



Trinkey State Conservation Area Plan of Management

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Trinkey State Conservation Area is in the traditional Country of the Gamilaraay (Gomeri) Aboriginal people.

This plan of management was prepared by staff of the Northern Plains Region of the NSW National Parks and Wildlife Service (NPWS).

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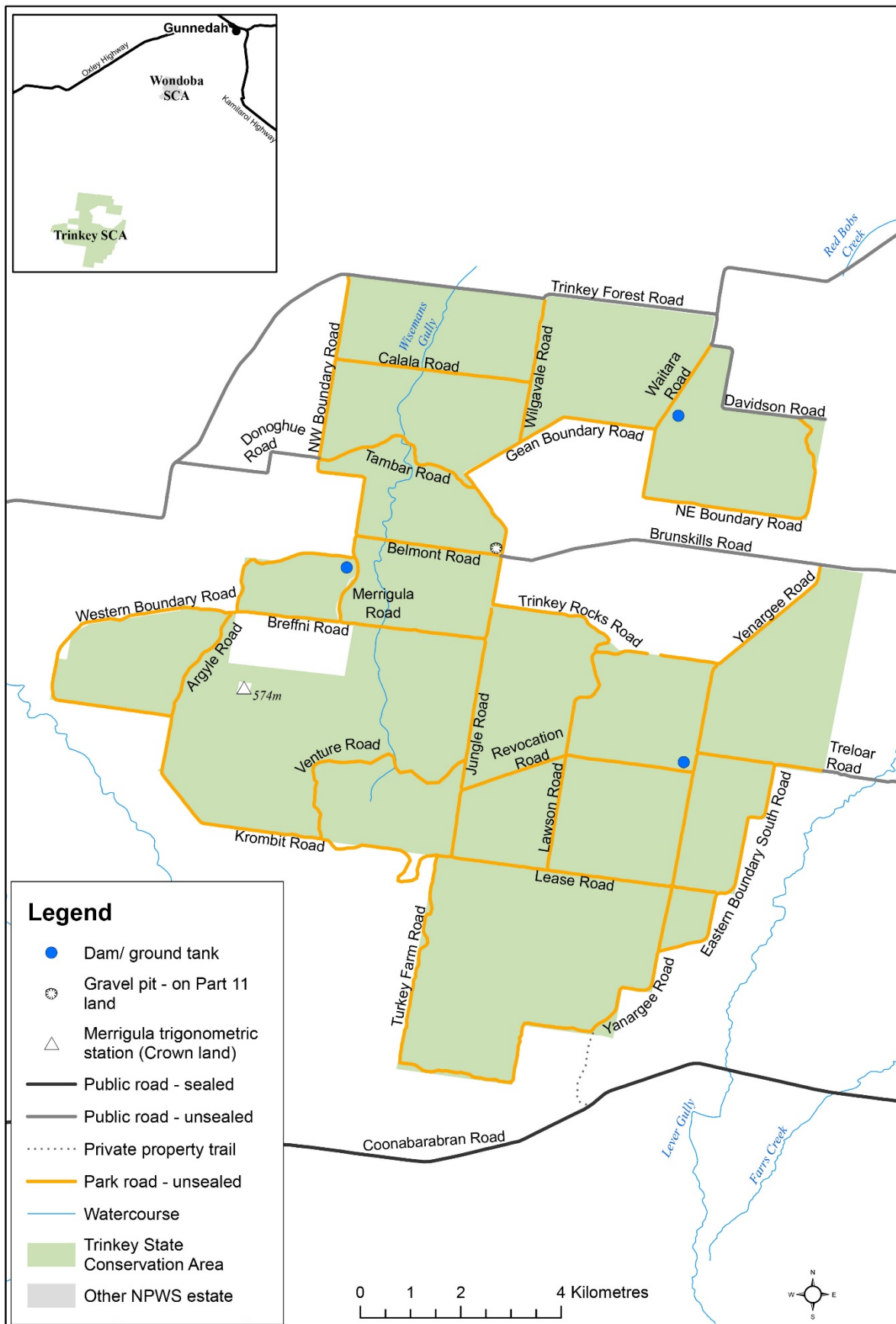


Figure 1 Map of Trinkey State Conservation Area

1. Introduction

1.1 Location, reservation and regional setting

Trinkey State Conservation Area (also referred to in this plan as ‘the park’) is 10,229 hectares, with a boundary 81.2 kilometres in length. It is located approximately 12 kilometres east of Tambar Springs, seven kilometres north–east of Premer and 41 kilometres south–west of Gunnedah.

Trinkey State Conservation Area is one of the parks established under the *Brigalow and Nandewar Community Conservation Area 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 the larger reserved lands to the west such as Warrumbungle National Park and the Pilliga conservation reserves, and the Liverpool Range to the south. It forms part of the catchment for Bundella and Coxs Creeks and the Lake Goran basin, part of the Namoi River Catchment.

Trinkey State Conservation Area is part of both the Liverpool Plains and the Pilliga subregions of the Brigalow Belt South Bioregion (Thackway & Cresswell 1995). Before being reserved as a state conservation area in December 2005 the land was managed as a commercial cypress pine forest by Forests NSW (now the Forestry Corporation of NSW) and included grazing leases.

The park is surrounded by private properties used for grazing and cropping and includes several roads that are vested in the Minister under Part 11 of the *National Parks and Wildlife Act 1974* (NPW Act) to ensure continued access by landowners to neighbouring land. These roads do not form part of the reserved 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).

Trinkey State Conservation Area lies partly within the Gunnedah and Liverpool Plains local government areas. The park falls within the area of the Walhallow Local Aboriginal Land Council and is part of the traditional lands of the Gamilaraay (Gomerioi) Aboriginal people. The park is within the area covered by the Gomerioi People’s Native Title Claim.

1.2 Statement of significance

Trinkey State Conservation Area is significant because of the following values:

Native plants

Trinkey State Conservation Area conserves remnants of the original vegetation and habitats of the Pilliga subregion of the Brigalow Belt South Bioregion. It contains a total of 358 vascular plant species. Two species, *Tylophora linearis* and *Commersonia procumbens* are listed as endangered under both the NSW *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Nine plant communities have been identified within the park, two of which are threatened ecological communities listed under both the BC Act and the EPBC Act. These include White Box – Yellow Box – Blakely’s Red Gum Community and Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Penepplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions.

Native animals

One hundred and fifty-five native animal species have been recorded within the park, including 103 birds, 25 reptiles, 20 mammals and seven amphibians. Of these, 10 bird species and three mammals (spotted-tailed quoll, koala and the little pied bat) are listed as threatened under the BC Act.

Aboriginal heritage

The park protects over 30 known Aboriginal sites, with a likelihood that more sites will be found. It provides an important connection to Country for the local Aboriginal community.

Historic heritage

Two historic blazed trees have been recorded in the park.

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, primarily the NPW Act and National Parks and Wildlife 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 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 historical 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 the park except in accordance with the plan. This plan will also apply to any future additions to the park. 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 Trinkey 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 as state conservation areas under the NPW 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 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 NPW 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 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 where mineral values do not allow for reservation under 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*. The review considers whether each state conservation area should or should not be reserved, as either a national park or nature reserve. Reviews were undertaken in 2008 and 2013 in which the status of Trinkey State Conservation Area remained unchanged.

Subject to the outcome of future reviews, in the long term it is intended that Trinkey Community Conservation Area, Zone 3 State Conservation Area becomes a national park and 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 Trinkey State Conservation Area will focus on the protection of significant vegetation communities, threatened native animal species and the protection of Aboriginal heritage sites.

Major strategies to achieve these objectives are:

- ongoing fire management so that people and property are protected from wildfire, and park values are maintained
- ongoing control of pest species to minimise their impact on park values
- protection of cultural heritage places with community involvement, in particular with members of the local Aboriginal community
- maintenance of information and regulatory signage.

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 to plant and animal species used by Aboriginal people. This plan of management aims to conserve both natural and cultural values. For reasons of clarity and document usefulness, various aspects of natural heritage, cultural heritage, threats and ongoing use are dealt with individually, but their interrelationships are recognised.

Trinkey State Conservation Area is a significant park within the region as it provides key habitat and refuge to a representative sample of native plants and animals, including woodland birds, in an area that is now mainly cleared of its original woodlands and forests.

3.1 Geology, landscape and hydrology

Trinkey State Conservation Area is located in the southern section of the Brigalow Belt South Bioregion. It is composed of country that rises gently from 330 metres above sea level in the north of the park, to a series of higher ridges 574 metres above sea level in the south–west section of the park. This ridgeline creates a watershed that drains westwards into Bundella and Coxs creeks and east and northwards to the Goran Lake basin.

The park is predominantly underlain by Jurassic Pilliga sandstones with associated conglomerates and siltstones. These overlie the earlier Purlawaugh Beds of lithic sandstone, shale, claystone and conglomerates and the Garrawilla Volcanics of dolerite, basalt, trachyte and tuff/breccia. These areas are surrounded to the north and west by water-deposited Quaternary alluviums, gravel, silt, sands and clay deposits of the Liverpool Plains. There is a minor Cenozoic basalt and dolerite intrusion of the earlier Pilliga sandstone in the central west section of the park (Geological Survey of NSW 1968).

The soils are predominantly yellow and red texture contrast soils with smaller regions of deep black cracking clays in the north and west.

Issues

- There is potential for soil erosion issues where small creeks intersect the park's roads or where water lies on road/track surfaces.
- Continued use of park roads by four-wheel drive vehicles and trail bikes during wet weather may result in significant damage to road surfaces. Without remedial action this could make the roads inaccessible to larger vehicles required for firefighting operations.

Desired outcomes

- Soil erosion is minimised.
- Roads and management trails are accessible.

Management response

3.1.1 Undertake all works in a manner that minimises erosion and water pollution. Assess park roads and take action to arrest the erosion.

3.2 Native plants

The vegetation of Trinkey State Conservation Area provides important links within the landscape, but also in terms of vegetation types, between the Warrumbungle and Pilliga areas to the north and the upper Hunter areas of the Wollemi and Goulburn River to the south and east. In terms of diversity, the park is ranked very highly in comparison to many other parks in western NSW across richness overall, regional diversity and species turnover (Hunter 2008).

A total of 358 vascular plant species have been recorded in the park. Two threatened plant species have been recorded in the park (OEH 2016b). *Tylophora linearis* is a twiner listed as vulnerable under the BC Act and as endangered under the EPBC Act. The main threats to this species are forestry activities, track maintenance, and inappropriate disturbance regimes (OEH 2016d). *Commersonia procumbens* is a prostrate shrub which grows in sandy soils often along roadsides. It is listed as vulnerable under both the BC Act and the EPBC Act (OEH 2016a). *Commersonia procumbens* was recorded at only one site within the park in 1999 and has not been recorded since.

Much of the park's vegetation is characterised by white cypress pine (*Callitris glaucophylla*), buloke (*Allocasuarina luehmannii*), black cypress pine (*Callitris endlicheri*), red ironbark (*Eucalyptus fibrosa*), white bloodwood (*Corymbia trachyphloia*) and narrow-leaved ironbark (*E. crebra*), with a scattered shrub layer of peach heath (*Lissanthe strigosa*) and a diverse ground layer of grasses, herbs and forbs (Hunter 2008).

Nine plant communities have been identified within the park, two of which contain components of threatened ecological communities.

Components of White Pine – Buloke – White Box Woodland are protected under the BC Act as White Box – Yellow Box – Blakely's Red Gum Woodland endangered ecological community. This vegetation also potentially meets the description of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland which is listed as critically endangered under the EPBC Act.

Additionally, components of the Pilliga Box – White Box – Myall Woodland and the Dirty Gum – Rough-barked Apple – Buloke Woodland are likely to constitute Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions. It is an endangered ecological community listed under the BC Act. Under the EPBC Act the same community is listed as Weeping Myall Woodlands.

Strategies for the recovery of threatened species, populations 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).

The nine vegetation types identified as part of a comprehensive vegetation survey conducted in 2008 (Hunter 2008) are listed below:

- Buloke – White Cypress Pine – Narrow-leaved Ironbark Forest
- White Cypress Pine – Buloke – White Box Woodland
- Pilliga Box – White Box – Weeping Myall Woodland
- White Box – Western Rosewood Woodland
- Dirty Gum– Rough-barked Apple – Buloke Woodland
- Buloke – Red Ironbark Woodland
- White Bloodwood – Red Ironbark – Black Cypress Pine Woodland
- Blakely's Red Gum– Black Cypress Pine Woodland
- White Cypress Pine – Black Cypress Pine – Red Ironbark – White Bloodwood Woodland.

The Buloke – White Cypress Pine – Narrow-leaved Ironbark Forest community is a layered woodland community restricted to the lower elevation parts of the park, particularly on the northern and eastern outwash flats on the deeper, moist but well-drained soils. It is composed of a tall tree layer of the three main tree species as well as black cypress pine, dirty gum (*E. chloroclada*), Pilliga box (*E. pilligaensis*), Blakely's red gum (*E. blakelyi*) and western grey box (*E. microcarpa*). The shrub and ground cover layer is diverse and includes *Acacia* and *Cassinia* species as the dominant shrubs.

The White Cypress Pine – Buloke – White Box Woodland is the largest community and covers nearly 40% of the park. It is generally layered woodland, however, the presence of understorey shrub layers is highly variable. This community is found throughout the central parts of the park, commonly between mid slopes and flats on well-drained and deep soils. Tree species include the canopy dominants white cypress pine, buloke and white box (*E. albens*), plus Pilliga box, yellow box (*E. melliodora*), dirty gum, narrow-leaved ironbark, kurrajong (*Brachychiton populneus*), rough-barked apple, grey box (*E. moluccana*), red ironbark, Blakely's red gum, black cypress pine, and motherumbah (*Acacia cheelii*). The shrub layer is dominated by several *Acacia* species, sticky daisy-bush (*Olearia elliptica*) and wilga (*Geijera parviflora*).

The remaining communities occur as small disjunct patches, linear strips or are scattered and dispersed throughout the park. Most are currently well-reserved across their range and generally not of conservation concern.

Another community, the Blakely's Red Gum – Black Cypress Pine Woodland, occurs with a low shrubby understorey in disjunct linear patches in the southern parts of the park on mid slopes on deep and moist to well-drained loamy sands. This community is typified by the two canopy dominants Blakely's red gum and black cypress pine along with white cypress pine and kurrajong, with numerous shrub species including *Leptospermum*, *Melaleuca*, *Callistemon*, *Acacia*, *Macrozamia* and *Grevillea* species. This is an unusual community type and likely to be naturally rare in the landscape (Hunter 2008).

Issues

- 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.
- There is potential to gain a fuller understanding of the native plant communities and the status of threatened plant populations.

Desired outcomes

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

Management response

3.2.1 Implement the relevant actions from the *Biodiversity Conservation Program* for threatened plant species occurring in the park.

3.2.2 Undertake systematic plant surveys to enhance the knowledge about plants in the park.

3.2.3 Monitor the regrowth of cypress pine and other species formerly harvested in the park.

3.3 Native animals

One hundred and fifty-five species of native animals have been recorded within Trinkey State Conservation Area including 103 bird, 25 reptile, 20 mammal and seven amphibian species (OEH 2016b). These include 12 threatened species as listed in Table 1.

Table 1 Threatened species recorded in Trinkey State Conservation Area

Common name	Scientific name	BC Act
Spotted harrier	<i>Circus assimilis</i>	Vulnerable
Little eagle	<i>Hieraaetus morphnoides</i>	Vulnerable
Glossy black-cockatoo	<i>Calyptorhynchus lathami</i>	Vulnerable
Little lorikeet	<i>Glossopsitta pusilla</i>	Vulnerable
Turquoise parrot	<i>Neophema pulchella</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
Koala	<i>Phascolarctos cinereus</i>	Vulnerable
Little pied bat	<i>Chalinolobus picatus</i>	Vulnerable
Bush stone-curlew	<i>Burhinus grallarius</i>	Endangered

BC Act = Biodiversity Conservation Act

Source: BioNet accessed 2016 at www.bionet.nsw.gov.au/

Those listed as vulnerable are likely to become endangered unless the circumstances and factors threatening their survival or evolutionary development cease to operate (OEH 2016c).

The bush stone-curlew is known from a single record and is listed as endangered under the BC Act. This means the species is likely to become extinct or is in immediate danger of extinction (OEH 2016c).

As for threatened plants, 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

- There is potential to gain a fuller understanding of the park's native animal species and populations.
- The *Northern Plains Region Biodiversity Monitoring Strategy* (DECC 2009a) provides a framework for monitoring.

Desired outcomes

- All native animal species are conserved.
- Key threatening processes are reduced.

Management response

3.3.1 Implement the relevant actions from the *Biodiversity Conservation Program* for threatened animal species occurring in the park.

3.3.2 Undertake targeted, systematic biodiversity surveys to enhance the knowledge base for management of the park's native animals.

3.4 Aboriginal heritage

Trinkey State Conservation Area lies within the traditional Country of the Gamilaraay (Gomeroi) People and within the Walhallow Local Aboriginal Land Council area. The park is also contained within the Gomeroi People's Native Title Claim which was registered with the National Native Title Tribunal in 2012 (NC2011/006). Gamilaraay and Gomeroi are variations in nomenclature which both refer to the same group of 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.

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. A cultural heritage site survey was conducted in May 2009 by members of the local Aboriginal community and NPWS staff. Over 30 sites have been recorded in the park including several scarred trees, grinding grooves and artefact scatters (DECC 2009b).

Many plant species growing within the park such as the grass tree (*Xanthorrhoea johnsonii*) and porcupine grass (*Triodia scariosa*), were also potentially used as food or medicinal plants, or for constructing tools and utensils (Hunter 2008).

While 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. It is policy that Aboriginal communities be consulted and involved in the management of Aboriginal sites, places and related issues, and the promotion and presentation of Aboriginal culture and history.

Issues

- The park is likely to contain many Aboriginal sites which are as yet unrecorded.
- Aboriginal people have expressed an interest in continuing their involvement in the park, including continued youth training opportunities.

Desired outcomes

- Aboriginal cultural features and historic features and values are identified and protected.
- Aboriginal people are involved in management of the Aboriginal cultural values in the park.

Management response

- 3.4.1 Precede all new ground disturbance work by an assessment for cultural features.
- 3.4.2 Consult and involve the Walhallow and Red Chief local Aboriginal land councils and other relevant Aboriginal community organisations in the management of Aboriginal sites, places and values, including interpretation of places or values.
- 3.4.3 Work cooperatively with Aboriginal people to provide 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 historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic significance. NPWS conserves the significant heritage features of the parks that it manages.

Two historic sites have been recorded within Trinkey State Conservation Area. There are two marked trees, dating from the 1930s to the early 1940s, which were blazed by the former Forestry Commission of NSW to indicate forestry coupe boundaries.

In 1878 part of the area now occupied by the park originally fell under the Trinkey Run lease. From early pastoral maps it appears that much of the land was heavily timbered (or scrubby) and was known locally as the Colly Blue Scrub (LPMA 2010). The Trinkey Run once covered an area of 12,800 acres (5,180 hectares) and was originally owned by George Loder and then by Robert Simson in 1888.

In the early 1890s Trinkey Forest Reserve No. 1261 was established over the Colly Blue Scrub area. Later in 1912 it was gazetted as Forest Reserve No. 28406 and made exempt from operation of ordinary timber licences (LPMA 2010). This forest reserve was converted to Trinkey State Forest on 18 November 1914 with further additions being added in 1924 and 1937 resulting in the present-day area of the park.

Evidence of former forestry practices can be found throughout the park in the form of snagging tracks, the remains of milled flitches and the many cypress and ironbark tree stumps. Evidence in the form of signage and cleared areas, now overgrown, indicates former use of the forest by apiarists.

Issues

- Two blazed survey trees dating from the late 1930s to the early 1940s have been recorded. No other historic sites are recorded for Trinkey State Conservation Area.

Desired outcome

- Historic heritage features and values are identified and protected.

Management response

3.5.1 Record any further blazed survey trees or other historic sites or artefacts found in the park and protect them from damage as far as possible.

3.6 Visitor use

Trinkey State Conservation Area is able to be accessed via Donoghue Road, three entrances off Trinkey Forest Road (also known as the Curlewis – Tambar Springs Road) and two entrances off Brunskills Road. All other entrances to the park are through private property. Signage exists at all the main access points indicating the activities that are permissible within the park.

Trinkey State Conservation Area is used for bushwalking, cycling and horse riding. The park also has a history of use for various other purposes by the local communities, including firewood collection, trail bike riding, hunting and off-road four-wheel driving. Some of these activities were previously permitted under the former Forests NSW management but are now not permitted in the park.

Horse riding is a popular recreational activity that has cultural associations for many Australians. Horse riding will be allowed in the park on the park roads shown on Figure 1.

There are currently no visitor facilities in the park and camping within Trinkey State Conservation Area is not permitted unless by consent. If demand for camping increases from its current very low level, consideration will be given to identifying areas where appropriate visitor facilities could be provided.

Issues

- Trinkey State Conservation Area has a long history of use by the local community for various purposes that are no longer permitted such as firewood collection, trail bike riding and hunting.
- Promotion of community understanding and appreciation of the conservation values of the park will be important for minimising illegal activities.

Desired outcomes

- Impacts upon park values are stable or diminishing.
- Use of the road network will not impact park values.
- Visitor use is ecologically sustainable and does not reduce park values.
- Visitors have an appreciation of park values and conservation issues.

Management response

3.6.1 Permit registered vehicle use, cycling and horse riding on park roads shown on Figure 1. The impacts of use will be monitored.

3.6.2 Permit camping in the park by consent.

3.6.3 Permit organised, self-reliant recreational groups and educational visits, subject to conditions to mitigate adverse impacts such as limitations on group size.

3.6.4 Investigate the need and best locations for information signage in the park.

3.6.5 Develop interpretation signage and other material for visitors and other stakeholders which provides information about park values and park management.

3.7 Education and research

The park has been used on occasions for educational purposes, particularly for training the local Aboriginal community in undertaking cultural surveys (DECC 2009b).

Research undertaken within Trinkey State Conservation Area to date has included native animal, native plant and cultural surveys conducted by NPWS and community groups to better understand the natural and cultural values of the park.

Issues

- Improved knowledge of park values and management effectiveness would benefit park management.

Desired outcomes

- Values are understood and the park is valued by the community.

Management response

3.7.1 Support research which will inform future management of the park such as restoration and management of native vegetation communities following cessation of logging activities.

4. Threats

4.1 Weeds and pest animals

Pest species are plants, animals and pathogens that have negative environmental, economic and social impacts; commonly they are 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 across that region's parks. These strategies also identify priorities for control, including actions listed in the *Biodiversity Conservation Program* (see Sections 3.2 and 3.3), 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 2012a) identifies pest species and priority programs for Trinkey 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 need to be developed to provide a more detailed approach. Significant pest species recorded in the park are discussed below.

Pest animals

Goats (*Capra hircus*), rabbits (*Oryctolagus cuniculus*), feral dogs (*Canis lupus familiaris*) and cats (*Felis catus*) occur in isolated populations restricted to small areas, while feral pigs (*Sus scrofa*) occur as scattered populations. The European fox (*Vulpes vulpes*) is widespread throughout the park. Each of these pest species is listed as a key threatening process under the BC Act (NSW SC 2004a, NSW SC 2002, NSW SC 2009, NSW SC 2000c, NSW SC 2004b and NSW SC 1998 respectively). All except for feral dogs are also listed under the EPBC Act (DoE 2009, TSSC 2001b).

Goat control is listed as a critical priority program within the NPWS pest management strategy (OEH 2012a). Colonies of threatened large-eared pied bats (*Chalinolobus dwyeri*) in the region are susceptible to disturbance by goats, as identified in the *Biodiversity Conservation Program*. Large-eared pied bats have not been recorded in the park to date but suitable habitat features such as moderately large sandstone overhangs are present. Only a small transient population of feral goats has been identified within the southern section of the park. This population is monitored and controlled as needed.

Feral pigs, foxes and wild dogs are all declared pests under the *Local Land Services Act 2013*. All land managers, including NPWS, are required to control (continuously suppress and destroy) declared pest animals to the extent necessary to minimise the risk of the pest causing damage to any land. Trinkey State Conservation Area contains localised high-density populations of feral pigs, which may cause damage to crops adjoining the park if left uncontrolled. Pig baiting programs are undertaken each winter and aerial culling is carried out strategically. Coordinated cross-tenure pest control programs with neighbouring landholders will achieve the best results.

A winter fox baiting program has been running in the park since 2006. A fox baiting program is conducted annually between April and September.

A low presence of wild dogs has been recorded within Trinkey State Conservation Area.

Weeds

The weeds of concern in the park include mother of millions (*Bryophyllum* sp.), tree pear (*Opuntia tomentosa*), common prickly pear (*O. stricta*) and tiger pear (*O. aurantiaca*). These weed species are sprayed annually during the appropriate seasons. Biological control agents such as cactus moth (*Cactoblastis cactorum*) and cochineal (*Dactylopius coccus*) have been spread within prickly pear infestations in the park. Thistles and other 'disturbance' weed species are present along edges of the trail network and along the park boundaries where the level of disturbance by vehicles, machinery and feral animals is greatest.

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 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.

Desired outcomes

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

Management response

- 4.1.1 Continue weed control and pest animal control programs as outlined in the pest management strategy.
- 4.1.2 Monitor the park for state level and regional level priority weeds and significant environmental weeds and treat any new outbreaks.
- 4.1.3 Work cooperatively with North West Local Land Services, Gunnedah Shire and Liverpool Plains Shire councils and neighbours in implementing coordinated weed and pest animal control programs.
- 4.1.4 Continue to record pest species sightings and to undertake control of wild dogs and other pest animals as needed.

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 BC Act (NSW SC 2000b).

There have been no recorded wildfires within Trinkey State Conservation Area. There is little evidence of fire scars and past wildfire events. Litter accumulation and understorey growth also support this observation.

A fire management strategy has been prepared for the park (OEH 2013c). The fire management strategy outlines the key assets within and adjoining Trinkey State Conservation Area including sites of natural and cultural heritage value, fire management zones, and fire control advantages such as management roads and water supply points. It also contains fire regime guidelines for conservation of the park's vegetation communities and identifies areas from which earthmoving machinery must be excluded due to steep terrain and erosion potential.

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 fire 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 and operations.

Management response

4.2.1 Manage wildfires in accordance with the fire management strategy for the park and update this strategy as required.

4.2.2 Undertake prescribed burns to maintain ecological values.

4.2.3 Continue to participate in the Liverpool Range Bush Fire Management Committee. Maintain coordination and cooperation with Rural Fire Service brigades, council fire control officers and neighbours with regard to fuel management and fire suppression.

4.3 Isolation and fragmentation

The area surrounding the park has been extensively cleared in the past, which has resulted in a high loss of biodiversity and fragmentation of habitat in the region. The park itself is somewhat isolated and less than 15% of the park boundary has a native vegetation buffer, the remainder being cleared agricultural land. As such it is important that any native vegetation buffers be preserved.

Long-term conservation of biodiversity depends upon 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.

Desired outcomes

- Maintain and enhance connectivity of the park with local woodland remnants.

Management response

4.3.1 Work with neighbours and relevant authorities 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 2014a). 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 Trinkey 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 2014a

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 and would hasten the death of large, mature trees on which many native animals depend for nesting and roosting (OEH 2011a).

Programs to reduce the pressures arising from other threats, such as habitat fragmentation, invasive species, bushfires and pollution, will help reduce the severity of the effects of climate change.

Desired outcomes

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

Management response

4.4.1 Continue existing fire, pest and weed management programs to increase the park's ability to cope with future disturbances, including climate change.

5. Management operations and other uses

5.1 NPWS management operations

There is an extensive network of unsealed park roads within Trinkey State Conservation Area. This network is maintained by NPWS for firefighting and park management purposes and are constructed to two-wheel drive, dry weather standard. All park roads are open to the public. In the park, some park roads are identified in signage as management trails. Park signage will be updated when they are due for replacement to reflect that these are park roads (open to the public) and not management trails (not open for public vehicle use).

An access strategy prepared for Trinkey State Conservation Area has identified several sections of park road which do not align with the legal boundary for the park. These include sections of Trinkey Rocks Road, Krombit Road and Western Boundary Road. To correct this, NPWS will work with neighbouring landholders to seek to secure permanent legal access.

The following roads have been reserved as Part 11 land, vested in the Minister to provide access through the park for adjoining landowners to access their properties: Wilgavale Road; Waitara Road; Gean Boundary Road between its junctions with Waitara Road and Belmont/Jungle Road; Belmont Road; North–West Boundary Road between the junction with Donoghue Road and Tambar Road, where it meets Merrigula Road. These roads do not form part of the reserved area of the park but their management is subject to this plan, the National Parks and Wildlife Regulation and the requirements of the EPA Act.

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

Desired outcomes

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

Management response

5.1.1 Maintain all park roads shown on Figure 1 for public access and park management purposes such as firefighting and weed control. All park roads will be maintained in accordance with the fire management strategy for the park. Park roads may be temporarily closed for park management purposes as required.

5.1.2 Park roads will remain accessible to the public and maintained to provide access by two-wheel drive vehicles in dry weather.

5.1.3 Secure legal access as required for management purposes.

5.1.4 Retain firefighting water supplies and maintain them as required.

5.2 Non-NPWS uses/operations

Mining and exploration

Exploration for minerals and petroleum, as well as mining and petroleum production, are permissible uses within state conservation areas. Trinkey State Conservation Area overlays an area of potential coal resources in the Maules Creek Coal Measures. This area also has moderate to high potential for coal seam gas (OEH 2014b). Two petroleum titles apply (PEL 1 and PEL 12) – both held by Australian Coalbed Methane Pty Ltd. (DIRE n.d.). These have been

renewed a number of times. As long as exploration 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.

Access by third parties

An inholding of private land is located south–east of the intersection of Breffni and Argyle Roads. Access for the landowner is available via Merrigula Road which is reserved as Part 11 land.

The Merrigula trig station is located on Crown land to the south of the inholding. The trig station is managed and maintained by Land and Property Information which requires occasional access through the park. An agreement between NPWS and the former Central Mapping Authority (now Land and Property Information, part of the Department of Finance, Services and Innovation) provides continued right of access to the station for survey purposes, subject to environmental impact assessment.

Gravel pits

A gravel extraction pit, not currently in use, is located off Gean Boundary Road just north of the Belmont/Jungle Road intersection. Gravel from this quarry was used in the past for construction and maintenance of the park's roads. The gravel pit is reserved as Part 11 land vested in the Minister and may be used to provide gravel for maintaining park roads in the future.

Domestic stock

From time to time stock have strayed into the park from adjoining properties. Fencing agreements have been put in place and this has largely resolved the problem of straying stock.

Apiary

There are six licensed apiary sites within the park. A further 44 sites are vacant and could potentially be reactivated in the future. These sites are recognised as existing interests under the NPW Act as they pre-date the park's reservation. NPWS policy on beekeeping allows existing sites to continue but does not allow any new or additional sites.

The European honeybee (*Apis mellifera*) can have adverse impacts on some native plants and animals (Paton 1996) including poor flower pollination and competition with native nectar feeders. Competition from feral honeybees has been listed as a key threatening process under the BC Act (NSW SC 2006). While managed honeybees were not the subject of this determination, it may be necessary to relocate existing bee sites where apiary activities result in unacceptable environmental impacts, user conflicts or are inconsistent with the park's management.

Desired outcomes

- Mining and mineral exploration activities have minimal impact on natural and cultural values.
- Use of the gravel resource for road maintenance or construction will not impact park values.
- Apiary activities have minimal impacts.

Management response

- 5.2.1 Ensure applications for mining or mineral exploration in the state conservation area are subject to environmental impact assessment and approvals.
- 5.2.2 Investigate the gravel resource of the existing quarry for its quality and volume to determine its suitability to be used by NPWS for maintenance of the park's road network.
- 5.2.3 Monitor the park for feral beehives and use of apiary sites. Investigate whether existing authorised apiary sites in the park need to be relocated due to unacceptable environmental impacts, user conflicts or park management programs, and if necessary relocate them in accordance with the *NPWS Beekeeping Policy*.
- 5.2.4 Ensure the boundary of the park is fenced and stock-proof in accordance with the *NPWS Boundary Fencing Policy*. Establish agreements under the policy with adjoining landowners as required.

6. Implementation

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

Activities identified in the plan are listed in the table below. Relative priorities are allocated against each activity as follows:

- **High priority** activities are imperative to achieve the plan's 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 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 until amended or replaced in accordance with the NPW Act.

Table 3 List of management responses

Management response		Priority
3.1 Geology, landforms and hydrology		
3.1.1	Undertake all works in a manner that minimises erosion and water pollution. Assess park roads and take action to arrest the erosion.	High
3.2 Native plants		
3.2.1	Implement the relevant actions from the <i>Biodiversity Conservation Program</i> for threatened plant species occurring in the park.	High
3.2.2	Undertake systematic plant surveys to enhance the knowledge about plants in the park.	Low
3.2.3	Monitor the regrowth of cypress pine and other species formerly harvested in the park.	Medium
3.3 Native animals		
3.3.1	Implement the relevant actions from the <i>Biodiversity Conservation Program</i> for threatened animal species occurring in the park.	High
3.3.2	Undertake targeted, systematic biodiversity surveys to enhance the knowledge base for management of the park's native animals.	Low
3.4 Aboriginal heritage		
3.4.1	Precede all new ground disturbance work by an assessment for cultural features.	High
3.4.2	Consult and involve the Walhallow and Red Chief local Aboriginal land councils and other relevant Aboriginal community organisations in the management of Aboriginal sites, places and values, including interpretation of places or values.	Medium

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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.	Medium
3.5 Historic heritage	
3.5.1 Record any further blazed survey trees or other historic sites or artefacts found in the park and protect them from damage as far as possible.	Medium
3.6 Visitor use	
3.6.1 Permit registered vehicle use, cycling and horse riding on park roads shown on Figure 1. The impacts of use will be monitored.	Medium
3.6.2 Permit camping in the park by consent.	Medium
3.6.3 Permit organised, self-reliant recreational groups and educational visits, subject to conditions to mitigate adverse impacts such as limitations on group size.	Medium
3.6.4 Investigate the need and best locations for information signage in the park.	Low
3.6.5 Develop interpretation signage and other material for visitors and other stakeholders which provides information about park values and park management.	Low
3.7 Education and research	
3.7.1 Support research which will inform future management of the park such as restoration and management of native vegetation communities following cessation of logging activities.	Medium
4.1 Weeds and pest animals	
4.1.1 Continue weed control and pest animal control programs as outlined in the pest management strategy.	High
4.1.2 Monitor the park for state level and regional level priority weeds and significant environmental weeds and treat any new outbreaks.	Medium
4.1.3 Work cooperatively with North West Local Land Services, Gunnedah Shire and Liverpool Plains Shire councils and neighbours in implementing coordinated weed and pest animal control programs.	High
4.1.4 Continue to record pest species sightings and to undertake control of wild dogs and other pest animals as needed.	Medium
4.2 Fire	
4.2.1 Manage wildfires in accordance with the fire management strategy for the park and update this strategy as required.	High
4.2.2 Undertake prescribed burns to maintain ecological values.	High
4.2.3 Continue to participate in the Liverpool Range Bush Fire Management Committee. Maintain coordination and cooperation with Rural Fire Service brigades, council fire control officers and neighbours with regard to fuel management and fire suppression.	Medium
4.3 Isolation and fragmentation	
4.3.1 Work with neighbours and relevant authorities to encourage conservation of remnant native vegetation in the vicinity of the park.	Low

Management response		Priority
4.4 Climate change		
4.4.1	Continue existing fire, pest and weed management programs to increase the park's ability to cope with future disturbances, including climate change.	High
5.1 Management facilities and operations		
5.1.1	Maintain all park roads shown on Figure 1 for public access and park management purposes such as firefighting and weed control. All roads and trails will be maintained in accordance with the fire management strategy for the park. Park roads may be temporarily closed for park management purposes as required.	High
5.1.2	Park roads will remain accessible to the public and maintained to provide access by two-wheel drive vehicles in dry weather.	Medium
5.1.3	Secure legal access as required for management purposes.	High
5.1.4	Retain firefighting water supplies and maintain them as required.	High
5.2 Non-NPWS uses/operations		
5.2.1	Ensure applications for mining or mineral exploration in the state conservation area are subject to environmental impact assessment and approvals.	High
5.2.2	Investigate the gravel resource of the existing quarry for its quality and volume to determine its suitability to be used by NPWS for maintenance of the park's road network.	Low
5.2.3	Monitor the park for feral beehives and use of apiary sites. Investigate whether existing authorised apiary sites in the park need to be relocated due to unacceptable environmental impacts, user conflicts or park management programs, and if necessary relocate them in accordance with the <i>NPWS Beekeeping Policy</i> .	Medium
5.2.4	Ensure the boundary of the park is fenced and stock-proof in accordance with the <i>NPWS Boundary Fencing Policy</i> . Establish agreements under the policy with adjoining landowners as required.	High

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