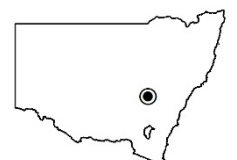




NSW NATIONAL PARKS & WILDLIFE SERVICE

# Mount Canobolas State Conservation Area

Planning Considerations



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Cover photo: Lichen covered rocks near The Walls, part of the endangered Mount Canobolas *Xanthoparmelia* Lichen Community. Marc Irvin/DPIE

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## How to use this document

This document relates the matters considered in preparing the *Mount Canobolas State Conservation Area Draft Plan of Management*. Matters that need to be considered when preparing plans of management are set out in Section 72AA(1) of the *National Parks and Wildlife Act 1974*.

The plan and planning considerations document are for use by park managers in developing and monitoring park management priorities. They also serve to inform communities about the values of the park and what the NSW National Parks and Wildlife Service (NPWS) is doing to care for them.

This document will be updated where appropriate. For example, if we have new information on the values of the park (e.g. new threatened species) or management approaches (e.g. a new pest management technique) or new programs. Scientific names of native plants and animals mentioned in the text are included in Appendix B; those of introduced species of plants and animals are included in Tables 3 and 4. Changes to this document cannot occur where they are inconsistent with the actions and performance measures of the *Mount Canobolas State Conservation Area Draft Plan of Management*.

## Acknowledgments

NPWS acknowledges that Mount Canobolas State Conservation Area is in the traditional Country of the Wiradjuri People.

This planning considerations document was prepared by staff of NPWS.

## Contacting NPWS

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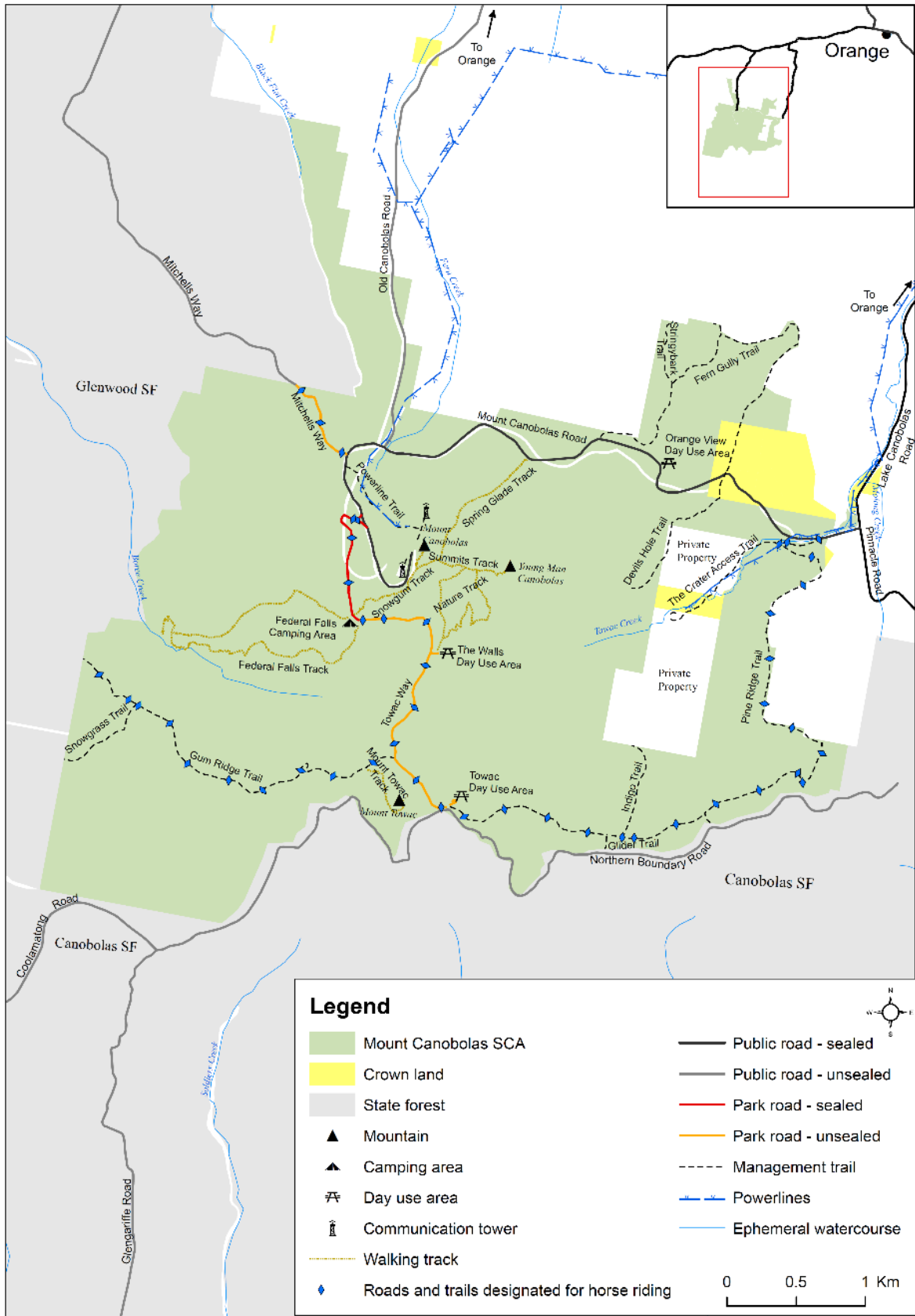


Figure 1 Mount Canobolas State Conservation Area

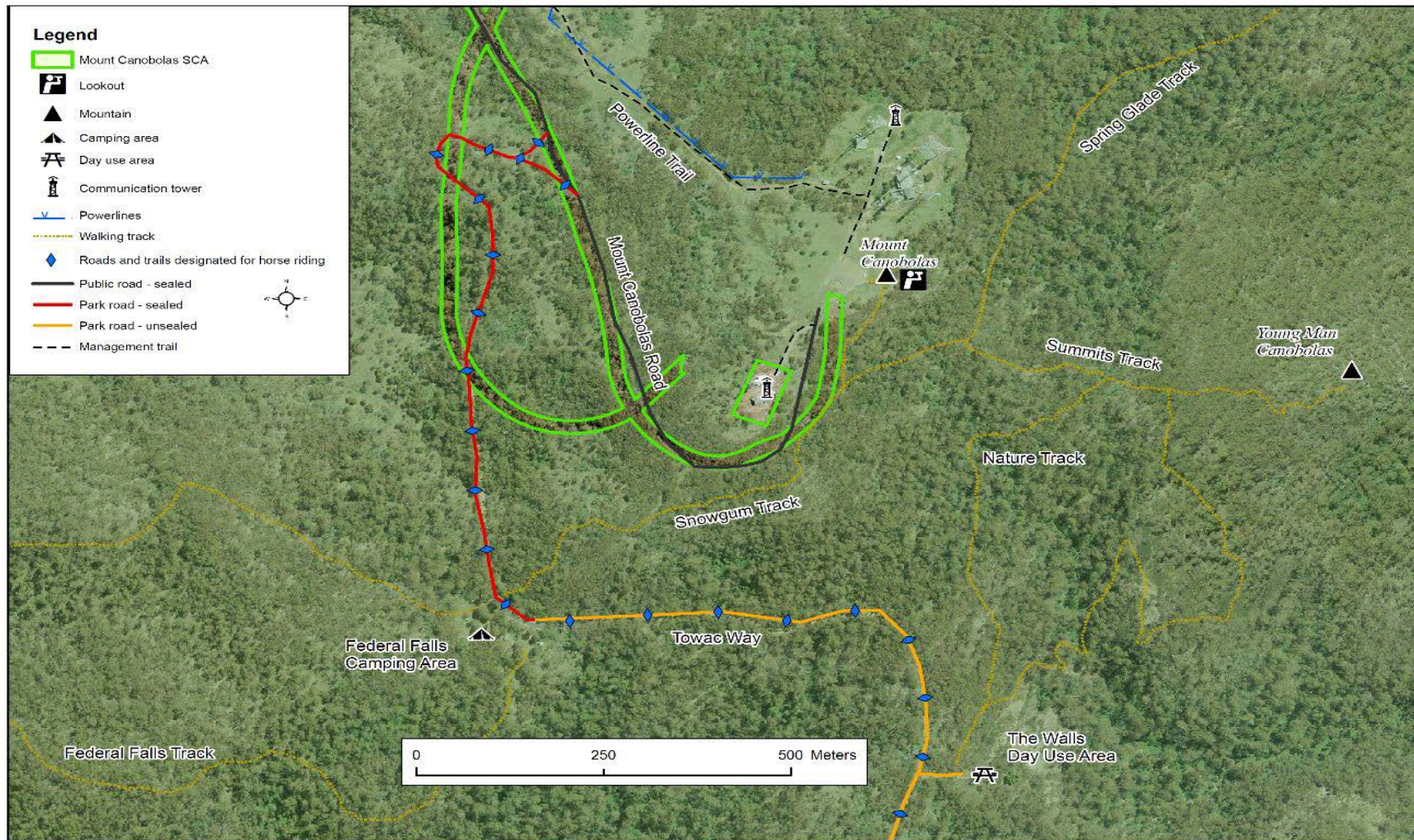


Figure 2 Mount Canobolas State Conservation Area summit

# 1. Landscape setting

Mount Canobolas State Conservation Area is located about 15 kilometres south-west of Orange in the NSW Central West and occupies an area of 1672 hectares.

Mount Canobolas is an extinct volcano and, with a height of 1397 metres above sea level, is one of the highest peaks between the Blue Mountains and Perth. Mount Canobolas and its surrounding peaks are an important landmark of the Central West, visible from up to 50 kilometres away. Views to Mount Canobolas from Orange and surrounds are striking.

The name Canobolas comes from the Wiradjuri Aboriginal *gaanha bulla* meaning 'two shoulders', referring to the two main peaks of Old Man Canobolas and Young Man Canobolas.

The summit of Mount Canobolas provides commanding 270-degree views over the rich agricultural country of the tablelands and slopes of the Central West. The township of Orange can be seen to the north-east, Barton Nature Reserve and Goobang and Nangar national parks to the west, Mullion Range State Conservation Area to the north, Conimbla National Park to the south-west and Winburndale Nature Reserve to the east.

The park lies within the Orange subregion of the South Eastern Highlands Bioregion (DEE 2012). The bioregion covers the dissected ranges and plateaus of the Great Divide, which are lower than the Australian Alps to the south-west. It extends to the Great Escarpment in the east, to the western slopes of the inland drainage basins to the west and continues south into Victoria.

The park contributes to two major catchments within the Murray-Darling Basin. Rainfall on the western side of the park drains into the Lachlan catchment whereas rainfall on the eastern side of the park drains into the Macquarie-Bogan catchment.

The natural vegetation of the Central West has been extensively cleared for agriculture and the remaining remnants are highly fragmented. Mount Canobolas State Conservation Area is an important island remnant in this landscape. The park contains one of the few subalpine areas in the Central West. Its isolation appears to have allowed the evolution of some unique plants and animals, distinct from similar species elsewhere in New South Wales.

The park has long been used for recreation by the people of Orange. Before reservation of the park, the Canobolas Regional Parkland Trust managed the Crown land known as Mount Canobolas Park, providing camping areas, picnic areas and walking tracks. The panoramic views from the summit continue to be a major drawcard for visitors from outside the region as well as locals, and Mount Canobolas is one of the most significant nature-based attractions in the NSW Central West and the most significant in the Orange area. The mountain is an important tourist attraction for both Cabonne and Orange City councils.

The agricultural land surrounding the park supports sheep and cattle grazing on the tablelands and crops such as wheat and canola on the slopes. Apple and cherry orchards and some native bushland adjoins the northern and eastern boundaries of the park. The apple orchards and vineyards on the lower slopes of Mount Canobolas to the north of the park are a significant element of the economy of the Orange region. The park is bounded by radiata pine plantations in Canobolas and Glenwood state forests to the south, west and north-west and there are private radiata pine plantations to the north of the park.

Mount Canobolas Park was reserved as Mount Canobolas State Recreation Area on 5 December 1997. In late 2002, amendments to the National Parks and Wildlife Act changed all state recreation areas to state conservation areas.

There is an 88-hectare inholding of predominantly cleared grazing country in the eastern section of the park. A small inholding (approximately 0.5 hectares) of Commonwealth land is located on the summit of Mount Canobolas. The mountain's prominence has resulted in a considerable amount of infrastructure being installed on the summit, including air safety, telecommunications, radio and television transmitter towers. Some of this infrastructure is in the park (see Section 6) and some in the summit inholding (see Figure 2).

The park is in the administrative areas of Cabonne Shire, the Orange Local Aboriginal Land Council and the Central Tablelands Local Land Services region.



Volcanic dyke. Photo credit: Helmut Bernt.



## 2. Protecting the natural environment

### 2.1 Geology and Landform

The geology of the park is one of the most interesting features and governs its vegetation, soils and landform.

The geology and landform of the area are the result of past volcanic activity. It is thought that at least three separate eruption events occurred about 13–11 million years before present. The first formed a large shield volcano and spread magma over hundreds of square kilometres forming the basis for the rich agricultural soils in and around Orange. The second and third eruptions produced slower moving lava that formed steep-sided features such as domes, vents, dykes and plugs as they cooled. Over millions of years, the softer outer rocks have eroded leaving the present-day landforms of relatively hard domes and plugs. These domes form the tops of the rounded peaks of the park including Mount Canobolas (or Old Man Canobolas), Young Man Canobolas and Mount Towac. These volcanic features are predominantly formed from trachyte rock.

Geological analysis (Sutherland 1995) indicates that Mount Canobolas is related to other volcanic landforms stretching in a chain from Oberon (about 100 kilometres south-east of the park) to south-east Queensland. The most famous of these are the Warrumbungle Range near Coonabarabran and the Nandewar Range near Narrabri. These areas of ancient volcanoes are conserved in Warrumbungle National Park and Mount Kaputar National Park respectively. These large shield volcanoes formed as the Australian plate moved northwards over a stationary 'hot spot' (Middlemost 1981, cited in Percival 1985).

Owing to its geology, Mount Canobolas is the dominant geographic feature in the Orange district, visible from up to 50 kilometres away. The summit of Mount Canobolas offers outstanding views of the surrounding countryside and is a major drawcard for visitors to the park. It is also an important telecommunications site – the towers on the summit are visually imposing and bear witness to the significance of the mountain to our modern lifestyle.

A major aim of this plan is to protect the scenic values of the park by protecting native vegetation and managing appropriate development.

Soils vary throughout the park. Deeper soil deposits are found on the lower slopes and in gullies, whereas thinner, skeletal soils occur on rocky outcrops and higher peaks. The soils on rolling and steeper slopes are formed from trachyte and basalt parent material, and skeletal sand and loams are found on the thinner upper slopes. Red earths and krasnozems are found on the lower slopes.

The topographical relief and altitude of Mount Canobolas affects local weather. Rising some 500 metres above the surrounding tablelands, it produces a strong orographic rainfall effect. Annual rainfall is approximately 200 millimetres higher in the park than in the surrounding lower country. It is common to receive 2–3 snowfalls per year, and snow can persist for up to three weeks on the sheltered southern aspects of the mountain. Cloud formation above the summit is not unusual and the summit can be shrouded in cloud while the surrounding countryside is clear, contributing to the higher annual rainfall figures.

Throughout the year, the temperature at the summit is usually noticeably lower than in the surrounding countryside. The windchill factor is also significant, especially in exposed areas during the cooler months. During spring the weather can vary greatly during the day.

### 2.1.1 Mineral prospectivity

Exploration for minerals and petroleum (including gas), as well as mining and petroleum production, are permissible uses in state conservation areas.

Mount Canobolas State Conservation Area is situated on Tertiary basalts of the Mount Canobolas shield volcano, which have been a source of construction materials and dimension stone. More significantly, in relation to mineral exploration, there are Ordovician to Early Silurian magmatic, volcanic and volcanic-derived sedimentary rocks that are the most prospective rocks for gold and copper in New South Wales (NPWS 2014). Consequently, exploration licences for Group 1 minerals (including copper, gold, lead, molybdenite, silver and zinc) cover Mount Canobolas State Conservation Area.

Significant metalliferous deposits may lie at depth (NPWS 2014). Numerous deep holes drilled through the basalt around Mount Canobolas resulted in the discovery of the Ridgeway ore body some 500 metres below the surface, the most profitable gold and copper ore deposit in Australia and part of Cadia Valley Operations. This operation, located less than 10 kilometres south of the park, comprises two underground mines and an open-cut mine. The mining lease for Cadia Valley Operations was last renewed in October 2017 and extends until 2038.

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



Boulders and ground cover. Photo credit: Boris Hlavica, DPIE.

## 2.2 Native plants and animals

### 2.2.1 Native plants

The native vegetation of the NSW Central West has been extensively cleared for agriculture and what remains is highly fragmented. The view from the summit of Mount Canobolas illustrates this dramatically. Only 25% of the original native vegetation cover of the NSW Central West remains (Goldney & Bowie 1991) and much of this is in poor or declining condition (Goldney et al. 1997). In such a landscape, areas such as Mount Canobolas State Conservation Area are highly significant for conservation.

The park is an isolated high-altitude remnant in relatively good condition. It contains one of the largest remnants of subalpine vegetation in the Central West, several species poorly represented in the Central West, and a number of threatened species and ecological communities listed under the NSW *Biodiversity Conservation Act 2016*.

The park is in the South Eastern Highlands Bioregion and the vegetation communities largely reflect this. There are, however, affiliations with Northern Tablelands vegetation communities. Many of the plant communities and plant species are at the north-western limit of their known distribution and some are highly significant (Hunter 2002; McCarthy & Elix 2014).

The vegetation communities in the park are considered to have developed in isolation from other high-altitude areas, which has led to a degree of uniqueness.

A total of 287 native plant species, in 57 families and 139 genera, has been recorded in the park. Seven vegetation communities have been identified in the park (Hunter 2000, 2002):

- snow gum – mountain gum grassy woodlands and tall open forests
- stringybark – peppermint shrubby open forest and woodlands
- grasslands and grassy open woodlands
- outcrop low open woodlands
- outcrop heath and shrublands
- waterfall low open woodlands
- disturbed creeklines.

See Appendix C for further details.

Most of the park is vegetated with grassy woodlands and tall open forests, with grasslands and grassy open woodlands at higher elevations and shrubby open forests and woodlands at lower elevations. The grassy woodland and tall open forest communities broadly intergrade. The woodland and tall open forest communities are dominated by snow gum, mountain gum and silver-leaf candlebark, with snowgrass as the dominant understorey species.

Patches of the outcrop communities are scattered across the park. These are associated with rocky outcrops and are significant owing to their assemblage of plants. They are restricted to the park and adjoining lands on Mount Canobolas. The threatened Mount Canobolas *Xanthoparmelia* Lichen Community (see Table 1 and Box 1) is found in the rocky outcrop heath and shrublands community.

Waterfall low open woodlands and disturbed creeklines are confined to small isolated areas within the park.

Three **threatened ecological communities** occur in the park (see Table 1). These occur as components of the seven identified vegetation communities of the park. Tablelands Snow Gum Grassy Woodland is the most widespread. Threats to these ecological communities include invasion by weeds and pests (see Section 2.2.3) and anthropogenic climate change

(see Section 2.2.5) is identified as a threat to Tablelands Snow Gum Grassy Woodland and the Mount Canobolas *Xanthoparmelia* Lichen Community. Other threats to the lichen community include disturbance from recreational use, including use of bikes and foot traffic, and high-intensity fire.

Two **threatened plant species** are known from the park: the vulnerable silver-leaf candlebark and a critically endangered prostanthera, *Prostanthera gilesii* (see Table 1 and Box 2).

There are also several other significant plants in the park:

- *Asterolasia rupestris* subsp. *rupestris*, which had been thought to have become locally extinct but was relocated in the park in 2008. The only other known occurrences are on the higher parts of Mount Kaputar National Park.
- Spinning gum, which is at the north-western limit of its distribution, and was previously known only from the Australian Capital Territory and further south.
- Mount Canobolas is an important lichen site and *Xanthoparmelia willisii*, which is not part of the endangered lichen community, is only known in New South Wales from Mount Canobolas and one other locality (McCarthy & Elix 2014).

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

Individual recovery plans may be prepared for nationally listed threatened species and recovery plans have been prepared for some species listed in New South Wales. To date, no threatened plants or communities known from the park have had a recovery plan prepared.



Juvenile leaves of silver-leaf candlebark. Photo credit: Barry Collier.

**Table 1: Threatened plants and ecological communities in the park**

Common name	Scientific name	Status <sup>A</sup>	
		BC Act	EPBC Act
Silver-leaf candlebark	<i>Eucalyptus canobolensis</i>	Vulnerable	Endangered
	<i>Prostanthera gilesii</i>	Critically Endangered	
<b>Communities</b>			
Mount Canobolas <i>Xanthoparmelia</i> Lichen Community	Mount Canobolas <i>Xanthoparmelia</i> Lichen Community	Endangered	
Tablelands Snow Gum Grassy Woodland	Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions	Endangered	
Tableland Basalt Forest	Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions	Endangered	

<sup>A</sup> BC Act = *Biodiversity Conservation Act 2016*;

EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*.

### **Box 1: Mount Canobolas *Xanthoparmelia* Lichen Community**

The endangered Mount Canobolas *Xanthoparmelia* Lichen Community occurs only on Mount Canobolas and is one of three threatened ecological communities in the park. It includes both rock-dwelling (saxicolous) and soil-dwelling (terricolous) lichens.

The Mount Canobolas *Xanthoparmelia* Lichen Community includes a range of lichens including *Cladia fuliginosa*, *Xanthoparmelia canobolensis*, *X. metastrigosa* and *X. sulcifera*. *X. metastrigosa* is known only from Mount Canobolas (McCarthy & Elix 2014). *X. canobolensis*, *X. sulcifera* and *Cladia fuliginosa* are known only from Mount Canobolas and one other locality in NSW (McCarthy & Elix 2014). It is likely that many species of invertebrates are associated with the lichens.

The endangered lichen community occurs within two of the park's vegetation communities: the snow gum – mountain gum grassy woodlands and tall open forests community and the rocky outcrop heath and shrublands community.

Threats to the lichen community include road and drainage works in areas where the lichen community occurs, collection of bush rock, disturbance from recreational use, including walking and cycling, anthropogenic climate change, and high-intensity fires (NSW SC 2001).

Patches of the endangered lichen community occur beside public roads, management trails and walking tracks. No new roads or management trails are proposed under this plan but works on existing roads and management trails must consider impacts on this endangered community. Further, existing walking tracks may need to be rerouted and any proposed cycling tracks will need to be carefully located to limit impacts on the Mount Canobolas *Xanthoparmelia* Lichen Community.

Several actions have been identified for the community through the *Saving our Species* program. These include detailed mapping of the community; inclusion of operational requirements for the community in the park fire management strategy; educating visitors to the park about the community and effects of trampling, bushfires and bushrock and firewood collection; and conducting research to better understand the community and to monitor its response to recovery actions.



Lichen covered boulders near The Walls form part of the endangered Mount Canobolas *Xanthoparmelia* Lichen Community (Marc Irvin/DPIE).

## 2.2.2 Native animals

The range of vegetation communities and the altitudinal range of the park provide a diversity of habitats for native animals. Furthermore, as a remnant island of native vegetation in a largely cleared and fragmented landscape, the park provides habitat for species that were formerly more widespread in the NSW Central West.

More than 120 species of native animals, including 74 species of birds, have been officially recorded in the park and more have also been observed, including up to 200 species of insects. Nine threatened native animals have been recorded in the park (see Table 2). However, there remains a need for systematic and targeted surveys to improve our understanding of the animals of the park. Knowledge of the species present in the park, their ecological requirements and their resilience to environmental change, particularly fire regimes, are essential for adaptive park management. For example, following the significant fire in early 2018 it will be particularly important to improve our understanding of how populations cope and restore after severe environmental change.

**Table 2: Threatened animals recorded in the park**

Common name	Scientific name	Status <sup>A</sup>	
		BC Act	EPBC Act
<b>Birds</b>			
Dusky woodswallow	<i>Artamus cyanopterus cyanopterus</i>	Vulnerable	
Flame robin	<i>Petroica phoenicea</i>	Vulnerable	
Little eagle	<i>Hieraaetus morphnoides</i>	Vulnerable	
Scarlet robin	<i>Petroica boodang</i>	Vulnerable	
Varied sittella	<i>Daphoenositta chrysoptera</i>	Vulnerable	
<b>Mammals</b>			
Eastern bentwing-bat	<i>Miniopterus schreibersii oceanensis</i>	Vulnerable	
Greater glider	<i>Petauroides volans</i>		Vulnerable
Yellow-bellied glider	<i>Petaurus australis</i>	Vulnerable	
Yellow-bellied sheathtail-bat	<i>Saccolaimus flaviventris</i>	Vulnerable	

<sup>A</sup> BC Act = Biodiversity Conservation Act; EPBC Act = Environment Protection and Biodiversity Conservation Act.

The dusky woodswallow and varied sittella are threatened woodland birds that have declined throughout the wheat–sheep belt of New South Wales (Reid 2000).

There are also several other significant animals known from the park, including:

- a rare form of agile antechinus
- Mount Canobolas velvet worm
- Mount Canobolas flatworm – an undescribed planarian worm.

As an isolated vegetated remnant, Mount Canobolas may also be an important stepping stone for migratory birds. The park may also provide habitat during seasonal faunal movements, with some native animals moving to higher and cooler altitudes available in the park in summer (e.g. grey currawong), whereas others that inhabit the park may move to warmer areas out of the park in winter. Recent work also indicates that Mount Canobolas is important habitat for a wide range of insects.

A systematic fauna survey of the park should be undertaken given the high likelihood of endemic species and of restricted populations that may require specific management.

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

Individual recovery plans may be prepared for nationally listed threatened species and recovery plans have been prepared for some species listed in New South Wales. Of the threatened native animals recorded from the park, only the yellow-bellied glider has had a recovery plan prepared (NPWS 2003).



Yellow-bellied sheath-tail bat. Photo credit: DPIE.

### 2.2.3 Weeds and pest animals

Weeds and pests are plants, animals and pathogens that have negative environmental, economic and social impacts and are most commonly introduced species. An introduced species is defined in this plan as any plant or animal species not native to the state conservation area. Pests and weeds can have effects across the range of park values, including on biodiversity, cultural heritage, and catchment and scenic values.

NPWS prepares regional pest management strategies that identify pest species across a region's parks. These strategies also identify priorities for control, including actions under the *Biodiversity Conservation Program* (see Sections 2.2.1 and 2.2.2) and other strategies such as the *NSW Biodiversity Priorities for Widespread Weeds* (DPI & OEH 2011) and the *NSW Biosecurity Strategy 2013–2021* (DPI 2013).



The NPWS regional pest management strategy (OEH 2012) identifies the pest species and priority programs for the park. 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 more detailed site- or pest-specific plans or strategies need to be developed.

Significant pests and weeds recorded in the park are listed in Tables 3 and 4. The *Biosecurity Act 2015* and regulations identify specific legal requirements for the prevention, eradication or containment of state-level priority weeds. These requirements apply equally to public and private land. A regional strategic weed management plan prepared under the Biosecurity Act identifies those pest plants that are priorities for management, investment and compliance effort within the Central Tablelands Local Land Services region (Central Tablelands LLS 2017). Similarly, regional strategic pest animal management plans have been developed to support the implementation of the Biosecurity Act. The *Draft Central Tablelands Regional Strategic Pest Animal Management Plan 2018–2023* (Central Tablelands LLS 2018) identifies regional priorities for pest animal management. These weed and pest animal priorities will be implemented via the relevant NPWS pest management strategy.

Some 47 introduced plants (Hunter 2000, 2002) have been recorded in the park. Significant pest plants that occur in the park include state-level and regional priority weeds (Central Tablelands LLS 2017) such as blackberry (see Box 3), serrated tussock, St John's wort, gorse, Scotch/English broom and willow (see Table 3). Radiata pine wildings are also present in the park (see Table 3).

Blackberry is a recognised threat to the two threatened plants found in the park: silver-leaf candlebark and *Prostanthera gilesii* (see Box 2). Invasion of radiata pine seedlings is also recognised as a threat to silver-leaf candlebark.

The endangered ecological community, Tablelands Snow Gum Grassy Woodland, is threatened by a range of weeds in the park including priority weeds (e.g. African lovegrass, blackberry, Chilean needlegrass, serrated tussock, St John's wort), environmental weeds (e.g. sweet briar), aggressive pasture grasses and escapes from horticulture or silviculture (e.g. radiata pine) (see Table 3). Weed invasion is also a recognised threat to the Tableland Basalt Forest endangered ecological community.

Although the soil-borne and highly pathogenic *Phytophthora cinnamomi* has not been recorded in the park, a species of *Phytophthora* was detected following dieback of several endangered prostanthera. The species and distribution of *Phytophthora* in the park is not known. *Phytophthora* has potential to adversely impact the park's threatened plants and communities and its spread throughout the park could be exacerbated by management and recreation activities. Infection of native plants by *Phytophthora cinnamomi* is listed as a key threatening process under the Biodiversity Conservation Act.

Pest animals known to occur in the park include red fox, goat, pigs, rabbits and deer (see Table 4). Pigs and red foxes move throughout and into and out of the park whereas the distribution of goats and rabbits is more limited. Pigs and foxes can spread introduced plants throughout the park: pigs disturb the soil allowing invasive plants to spread, and foxes eat blackberries in season and spread the seed throughout the park.

Invasion of remnants by feral animals, including rabbits, foxes, pigs and goats, is a recognised threat to the Tablelands Snow Gum Grassy Woodland threatened ecological community in the park. Moderate to heavy grazing by rabbits is a recognised threat to the Tableland Basalt Forest threatened ecological community.

Control programs have been undertaken for foxes over many years. Ground shooting of goats began in 2015–16 and was highly successful, and an annual shooting program

continues. Pigs are trapped when their activity affects park values, infrastructure or neighbouring properties.

The effects of pests on park values may be exacerbated by anthropogenic climate change (see Section 2.2.5).

Tables 3 and 4 summarise key information on the pests and weeds currently known to occur in the park. Further information on pests can be found on the [Department of Planning, Industry and Environment website](#). The *Local Land Services Act* declares certain animals to be pests.

**Table 3: Significant weeds in the park**

Common name	Scientific name	KTP <sup>A</sup>	State priority <sup>B</sup>	Regional priority <sup>B</sup>
African lovegrass	<i>Eragrostis curvula</i>	Y		Community concern
Blackberry	<i>Rubus fruticosus</i> agg.		Asset protection	Asset protection
Broad-leaved cotoneaster	<i>Cotoneaster glaucophyllus</i>			
Chilean needlegrass	<i>Nassella neesiana</i>	Y	Asset protection	Contain
Gorse	<i>Ulex europaeus</i>		Asset protection	Contain
Hawthorn	<i>Crataegus monogyna</i>			
Radiata pine	<i>Pinus radiata</i>			
Scotch broom, English broom	<i>Cytisus scoparius</i> subsp. <i>scoparius</i>	Y	Asset protection	Asset protection
Serrated tussock	<i>Nassella trichotoma</i>	Y	Asset protection	Asset protection
St John's wort	<i>Hypericum perforatum</i>			Asset protection
Sweet briar	<i>Rosa rubiginosa</i>			
Willow	<i>Salix fragilis</i>		Asset protection	Community concern

<sup>A</sup> KTP = key threatening process listed under NSW *Biodiversity Conservation Act 2016*.

<sup>B</sup> = Priority as determined in *Central Tablelands Regional Strategic Weed Management Plan 2017–2022* (Central Tablelands LLS 2017).

### Box 2: Threatened Plants

A critically endangered **prostanthera**, *Prostanthera gilesii*, and the vulnerable **silver-leaf candlebark** are known only from Mount Canobolas. The restricted distribution of both species places them at an elevated risk of extinction.

*P. gilesii* is found only in the park (Conn & Wilson 2015), with an estimated total population of less than 50 mature plants (NSW SC 2017) in two populations. The larger population occurs along a creek line in wet sclerophyll forest. The smaller population occupies a rocky crevice surrounded by heath.



*Prostanthera gilesii*. Photo credit: Steve Woodhall, DPIE.

The population of silver-leaf candlebarks is more secure, with an estimated of about 60,000 individuals (OEH 2017b). Silver-leaf candlebark is generally found between 1100 and 1300 metres above sea level but can occur as low as 850 metres and above 1300 metres. It occurs in subalpine woodland growing on undulating low hills through to steep hills and slopes. Mount Canobolas State Conservation Area is identified as a key management site for silver-leaf candlebark under the *Saving our Species* program.

Threats to these species within the park include disturbance by feral pigs, infestations of blackberry, invasion of radiata pine wildings and high-frequency fire. Repeated fires may limit recruitment of silver-leaf candlebark and cause mortality, and anthropogenic climate change is likely to result in contraction of the distribution of silver-leaf candlebark to higher altitudes and, possibly, to extinction in the wild. Human visitation and soil pathogens are also considered threats to *P. gilesii* (NSW SC 2017) and there has been unauthorised collection of this species.

Several management actions have been identified to secure the silver-leaf candlebark in the wild, both within and outside the park, including:

- Improved fire management planning to ensure that appropriate fire regimes are maintained for the species.
- Weed control, especially for blackberry and radiata pine wildings.
- Augmenting the wild population with ex situ material if required.
- Monitoring of the population and the extent and severity of threats to assess the effectiveness of management.
- Ensuring maintenance of roads, trails and tracks, or other infrastructure and development activities involving disturbance of substrates or vegetation do not adversely affect populations of silver-leaf candlebark (DEE 2017).

It is expected that similar management actions will be developed to protect and secure the populations of *Prostanthera* in the park.

### Box 3: Blackberry

Blackberry is a state-level and regional priority weed (Central Tablelands LLS 2017) and is one of the main weeds of the park. It is widespread throughout the park and has invaded undisturbed areas.

Annual control has been undertaken in the park since 1997, mainly targeting readily accessible blackberry infestations. However, ground control has slowed as remaining infestations are in more difficult terrain and harder to reach. To improve control, aerial spraying of the more remote and inaccessible locations is required, but this is expensive.



Treated blackberry (the reddish areas) below Federal Falls. Photo credit: Steve Woodhall, DPIE.

In addition to traditional control using chemicals, it may also be possible to undertake biological control of blackberry in the park. NPWS will investigate the potential for release of biological control agents for blackberry.

Blackberry is not just an issue for the park. It is also widespread on neighbouring properties, including state forests. It is essential to maintain cooperation with neighbours to control blackberry across the landscape.

Blackberry infestations are a recognised threat to the threatened plants found in the park, impeding regeneration of silver-leaf candlebark and competing with the critically endangered *Prostanthera gilesii*.

Blackberry infestations also provide shelter for feral pigs and may build fuel loads that can increase the intensity of fires, further threatening the critically endangered *P. gilesii* (NSW SC 2017) and other park values.

Two of the park's three threatened ecological communities, Tablelands Snow Gum Grassy Woodland and Tableland Basalt Forest, are directly threatened by weed invasion, including invasion by blackberry.

Given these potential impacts on some of the park's key biological values, it is critical that control of blackberries continues and, where possible, increases significantly. Furthermore, efforts to encourage neighbours to control blackberry on adjoining properties should continue.

**Table 4: Significant pest animals in the park**

Common name	Scientific name	KTP <sup>A</sup>	Declared pest <sup>B</sup>	Priority <sup>C</sup>
Goat	<i>Capra hircus</i>	Y	N	Asset based protection
Pig	<i>Sus scrofa</i>	Y	Y	Asset based protection
Rabbit	<i>Oryctolagus cuniculus</i>	Y	Y	Asset based protection
Red deer	<i>Cervus elaphus</i>	Y	N	Asset based protection
Red fox	<i>Vulpes vulpes</i>	Y	Y	Asset based protection

<sup>A</sup> KTP = Key threatening process listed under NSW *Biodiversity Conservation Act 2016*.

<sup>B</sup> Declared pests as per Local Land Services Act 2013.

<sup>C</sup> = Priority as determined in *Draft Central Tablelands Regional Strategic Pest Animal Management Plan 2018–2023* (Central Tablelands LLS 2018).

### 2.2.4 Fire in the park

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 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 plant and animal species and communities, and high-frequency fires have been listed as a key threatening process under the Biodiversity Conservation Act (NSW SC 2000b).

Much of the park's natural vegetation has a grassy understorey. Before European settlement, periodic burning by bushfires and Aboriginal people played a significant role in the development of these grassy ecosystems and regular fire is required to maintain the grassy understorey. Too-frequent fire however may limit recruitment of some species, cause local extinctions of fire-sensitive species, facilitate the spread of weeds, reduce specific elements of native animal habitat, such as fallen logs, tree hollows and ground litter, and directly threaten native animal populations.

Careful management of fire, of its frequency and intensity, is required to ensure the diversity of vegetation communities is maintained, including those communities with a grassy understorey. High-intensity fire is recognised as a threat to the endangered lichen community.

Mount Canobolas State Conservation Area has had a low frequency of wildfires. While a significant wildfire burnt through the park in February 2018, the previous wildfire of note was in December 1982. The 1982 fire, which started adjacent to the park, burnt approximately 80% of the park. The February 2018 fire, which started near Mitchells Way, burnt more than 70% of the park and spread to neighbouring properties, including commercial forests and orchards.

The steep terrain of the park makes construction of fire control lines difficult, which means that fires that start in the park or enter the park can burn substantial parts of it. NPWS will work with the Rural Fire Service and Forestry Corporation of NSW to investigate and, if

appropriate, construct a new management trail on the western side of the park to provide a control line that may assist firefighters in minimising the size and intensity of fires in this part of the park.

NPWS undertakes hazard reduction burns in the park. Since 2000, seven prescribed burns have been undertaken covering approximately 20% of the park.

Although the fire history of the park indicates that high-intensity wildfire has been fairly infrequent, the intense wildfire in 1982 promoted shrubby understorey species at the expense of grasses. High-intensity fire is recognised as a threat to the endangered lichen community, some of which was burnt in the 2018 wildfire.

A fire management strategy that defines the fire management for the park has been prepared (OEH 2014b). The strategy, which will be updated to include the 2018 fire, includes biodiversity thresholds of at least 10 years between fires in the heathlands and rocky outcrops and in the shrubby understorey dry sclerophyll forests in the park, and intervals between 8 and 40 years for those woodlands and tall open forests with a grassy understorey.

The strategy outlines conservation measures for Aboriginal cultural heritage, threatened species and threatened ecological communities known from the park. For example, the strategy notes that threatened lichens occur on rocky outcrops and provides management guidelines for this community, including avoiding disturbance by vehicles and earthmoving machinery, and avoiding the use of firefighting foams and retardants.

The park fire management strategy identifies asset protection zones at Mount Canobolas summit, Federal Falls Camping Area and The Walls Day Use Area. At these sites, fire management is aimed at the protection of life and property. The rest of the park is zoned as land management zone where fire management is focused on conserving biodiversity and protecting cultural and historic heritage.

In addition to the park fire management strategy, a post-fire recovery program will be prepared and implemented following the 2018 fire. The program will plan and determine priorities for fire response tasks, including infrastructure repair, post-fire rehabilitation works, weed and pest control and research and monitoring of biodiversity fire response.

NPWS maintains cooperative arrangements with surrounding landowners and the Rural Fire Service and is a member of the Canobolas Bush Fire Management Committee.

### **2.2.5 Climate change impacts**

Human-induced climate change is listed as a key threatening process under the Biodiversity Conservation Act (NSW SC 2000a) and habitat loss caused by human-induced greenhouse gas emissions is listed under the *Environment Protection and Biodiversity Conservation Act 1999* (TSSC 2001).

The latest projected changes to climate are from the NSW and ACT Regional Climate Modelling (NARClm) 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’. The snapshot shown in Table 5 is for the Central West and Orana Region, which includes Mount Canobolas State Conservation Area (OEH 2014a).

The projected increases in temperature, number of hot days and severe fire weather days (OEH 2014a) are likely to influence bushfire frequency and intensity across the Central West and Orana Region. Historically, the region experiences more than 30 very high to extreme fire danger days every year. The number of very high to extreme fire danger days are projected to increase by 10–50% and the conditions conducive to large and intense fires, such as prolonged drought, low humidity, number of hot days and high wind speeds, will more than likely increase (DECCW 2010).

**Table 5: Central West and Orana Region climate change snapshot**

<b>Projected temperature changes</b>	
Maximum temperatures are projected to <b>increase</b> in the near future by 0.4–1.0°C	Maximum temperatures are projected to <b>increase</b> in the far future by 1.8–2.7°C
Minimum temperatures are projected to <b>increase</b> in the near future by 0.5–0.9°C	Minimum temperatures are projected to <b>increase</b> in the far future by 1.5–2.6°C
The number of hot days (i.e. >35°C) will <b>increase</b>	The number of cold nights (i.e. <2°C) will <b>decrease</b>
<b>Projected rainfall changes</b>	
Rainfall is projected to <b>decrease</b> in spring	Rainfall is projected to <b>increase</b> in autumn
<b>Projected Forest Fire Danger Index changes</b>	
Average fire weather is projected to <b>increase</b> in summer, spring and winter	Severe fire weather is projected to <b>increase</b> in summer, spring and winter

Source: OEH (2014a).

Climate change may affect biodiversity significantly by altering the size of populations and the distribution of species and altering the geographical extent and species composition of habitats and ecosystems. Species most at risk are those unable to disperse or adapt, particularly those with small population sizes or with slow population growth rates. Opportunities for species to disperse from Mount Canobolas or to shift to higher altitudes are restricted.



*Eucalyptus saxicola* at Mount Canobolas State Conservation Area. Photo credit: Barry Collier, DPIE.

The combined effects of increased temperatures, large wildfires, and more favourable conditions for pests and weeds may adversely impact the natural ecosystems of the park. However, the potential impact of climate change on the park is difficult to assess since it

depends on the compounding effects of other pressures, particularly barriers to dispersal and pressure from introduced animals. Barriers to dispersal are a significant issue for the species of Mount Canobolas. In highly cleared and fragmented ecosystems, such as those in which Mount Canobolas occurs, species are likely to be at greater risk than those in more intact ecosystems.

Furthermore, there is limited scope for the subalpine species to migrate higher as a response to climate change. For this reason, climate change is identified as a threat to the threatened silver-leaf candlebark, known only from Mount Canobolas. It is likely to result in a contraction of the species to higher altitudes and possibly to extinction in the wild.

Anthropogenic climate change is also identified as a threat to several of the endangered ecological communities known to occur in the park including Tablelands Snow Gum Grassy Woodland and the Mount Canobolas *Xanthoparmelia* Lichen Community.

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



Dusky woodswallow. Photo credit: Michael Todd.



### 3. Looking after our culture and heritage

Both Aboriginal and non-Aboriginal people place values on cultural and natural landscapes. These values may be attached to the landscape as a whole or to parts of the landscape such as a particular plant, animal or place. All landscapes contain the imprint of human use – on any given area of land, some historical activity will have taken place. Much of the Australian environment has been influenced by past land-use, and people continue to influence the land through recreational use, cultural practices, the presence of introduced plants and animals and, in some places, air and water pollution.

#### 3.1 Aboriginal culture and heritage

The cultural landscape of the park is part of the Country of the Wiradjuri People, whose cultural boundaries are defined by landscape features and patterns of traditional use on Country.

**What is 'Country'?** To Aboriginal people, the landscape is made up of many features that are interrelated. These include land, water, plants and animals, places and stories, historical and current uses, and people and their interactions with each other and place. These features are central to Aboriginal spirituality and contribute to Aboriginal identity. They are inseparable and make up what is known as 'Country'.

The Country of the Wiradjuri People is known as the land of the three rivers, extending across a vast area of central New South Wales from the Great Divide in the east, and bordered by the Macquarie, Lachlan and Murrumbidgee rivers.

The name Canobolas comes from the Wiradjuri words gaanha bulla meaning 'two shoulders', referring to the two main peaks, Old Man Canobolas (Mount Canobolas) and Young Man Canobolas.

Mount Canobolas is a major Wiradjuri ceremonial site. Dreaming stories are known by some people with a strong traditional connection to Orange, but the stories are not in the public domain (NTSCORP 2012). Nevertheless, it is because of this ongoing traditional knowledge that the site retains its significance to contemporary Wiradjuri People.

In pre-contact times, Mount Canobolas was an important occupation site. It is likely that people camped on the mountain when major ceremonies, such as initiations, took place (NTSCORP 2012). It is not known when the last ceremony was conducted on the mountain, although initiations in other parts of Wiradjuri Country seem to have continued into the early 20th century.

Mount Canobolas has contributed to the social, economic and ceremonial life of the Wiradjuri People for thousands of years and the local Aboriginal community regard Mount Canobolas as highly significant. Aboriginal people have continuing cultural associations and connections to Country in the park including 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 Country are inseparable and need to be managed in an integrated manner across the landscape.

There has been no systematic survey of the park for Aboriginal sites and only 11 Aboriginal sites have been recorded in the park, including open campsites, stone tool working sites and a scarred tree.

**Aboriginal sites** are places with evidence of Aboriginal occupation or places 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.

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



Lichen covered boulders. Photo credit: Boris Hlavica, DPIE.

## 3.2 Shared cultural heritage

History takes place across the landscape. It includes the history of the first Australians – Aboriginal people – and **our shared history** since European settlement. 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 NSW parks and reserves.

Heritage places and landscapes are made up of living stories as well as connections to the past that individuals and communities have inherited and wish to conserve for current and future generations. They can include natural resources, objects, customs and traditions.

Little is known about past European use of the park and further work is required to increase our understanding of this shared cultural heritage.

In 1815 Governor Lachlan Macquarie sent surveyor George Evans on an expedition south-west of Bathurst to find the direction of flow of the Macquarie River. On 23 May 1815 Evans viewed what was to become known as Mount Canobolas and named it Jamieson's Table

Mountain. In 1835 Major Thomas Mitchell was the first European to scale Mount Canobolas while searching for the course of the Darling River.

In 1876 Mount Canobolas was set aside as a water reserve for travelling stock and since then has been under some form of reservation. The Canobolas Regional Parklands Reserve Trust administered Mount Canobolas and another 35 crown reserves in the NSW Central West until 1997 when the area was reserved as Mount Canobolas State Recreation Area. In 2002 the NSW Government introduced legislation to change the status of all state recreation areas to state conservation areas.

The park has reportedly been used for some small-scale timber harvesting and stock grazing in the past. It was the site of a proposed water supply dam for the city of Orange and test foundation holes were dug near the eastern boundary of the park. The park may also contain historic transport routes.

These heritage items have not been assessed to determine their historical significance. An assessment of significance is required before decisions are made about the future management of any of these sites. Should they be found to be of national or state significance, a conservation management plan will be prepared. For structures of local heritage significance, a heritage action statement may be prepared to guide future management and works.

## 4. Providing for visitor use and enjoyment

State conservation areas are places where biodiversity is conserved, ecosystem function and natural landscapes are maintained and where places, objects and features of cultural value are conserved. State conservation areas are also places where:

- provision is made for sustainable visitor or tourist use and enjoyment, where it is compatible with the conservation of the state conservation area's natural and cultural values
- provision is made for the sustainable use (including adaptive reuse) of any buildings or structures or modified natural areas
- provision can be made for appropriate research and monitoring.

These fundamental purposes are recognised in the management principles for state conservation areas established under the National Parks and Wildlife Act.

The summit of Mount Canobolas is a significant destination for tourists and visitors to the region. NPWS visitor surveys during peak periods in 2006 revealed that more than 60% of visitors to the summit originate from outside western NSW, with approximately 10% of visitors being from interstate or overseas. The surveys also revealed that more than 75% of visitors surveyed spent less than half a day in the park, with many simply visiting the summit for the view and then leaving. Few visitors surveyed stayed to use the picnic areas and walking tracks of the park or camped overnight in the park.

Based on NPWS traffic counter and vehicle surveys, it is estimated that approximately 75,000 people visit the summit each year. Visitation is generally higher in the warmer months of summer and autumn, with a decrease in numbers during the colder months of winter and spring. Public holidays and long weekends, such as Easter, are particularly popular times for visitors. Nearly all vehicles use the Mount Canobolas Road from east of the park to reach the summit (see Figure 1).



Bushwalkers on Federal Falls Track. Photo credit: Boris Hlavica, DPIE.

## 4.1 Interpretation and promotion

Promoting the values of the park and its recreational opportunities assists the protection of the natural and cultural heritage of the park, promotes support for conservation and increases the enjoyment and satisfaction of visitors.

As discussed above, many people only visit the park for the views from the summit and do not explore other recreational opportunities in the park. Consequently, information at the summit will be seen by most park visitors and is particularly important to promote the full range of recreational opportunities available in the park and to make visitors aware of the natural and cultural values of the park and the threats to those values. New interpretive signage will be developed and installed at the summit and other key visitor destinations in the park.

Other important components of interpretive information and signage, both within the park and online, are the provision of safety and directional (or wayfinding) information.

All new NPWS signs in the park will be consistent with the NPWS Park Signage Manual. A program to upgrade existing NPWS signs will be undertaken.

The importance of Mount Canobolas to the local tourism industry is well recognised by Cabonne Shire, Orange City Council and the local community. NPWS will continue to work cooperatively with local government tourism organisations to ensure the park is appropriately promoted as part of the tourism opportunities in the local area. This may include inclusion of the park in regional tourist drives, appropriate signposting to the park as well as installation of information and interpretive displays at strategic locations within the park.

## 4.2 Recreation

NPWS parks provide a wide range of visitor opportunities and NPWS aims to ensure that visitors enjoy, experience and appreciate parks while their values are conserved and protected.

Mount Canobolas State Conservation Area has long been used as a recreation area for the people of Orange, and the Mount Canobolas summit has long been a destination for travellers from other areas of New South Wales and interstate. Before reservation of the park, the Canobolas Regional Parkland Trust provided several camping areas, picnic areas and walking tracks.

The park is a significant recreation resource because of its place in the landscape, its natural values, the infrastructure provided and its proximity to a major regional city. The park offers a level of facilities in a bushland setting not available elsewhere in the NSW Central West. Recreational activities undertaken in the park include picnicking, camping, bushwalking, photography, cycling and horse riding.

The primary visitor destination in the park is the summit of Mount Canobolas. In addition to the facilities provided at the summit, the park has a camping area, a number of day use areas and lookouts and six walking tracks.

At nearly 1400 metres altitude, the summit is usually noticeably cooler than the surrounding countryside and the windchill factor can be significant. These factors combined with highly variable spring weather can pose potential problems for visitors who are not prepared for cold temperatures or sudden rain. Snowfalls can also cause problems for vehicles accessing the summit because roads can be impassable for 2–3 days at a time.

### **4.2.1 Vehicle access**

Mount Canobolas State Conservation Area has approximately 13 kilometres of roads available for public vehicle use. This includes Mount Canobolas Road and Old Canobolas Road (see Figure 1), which are both public roads administered and maintained by Cabonne Council and not part of the park. It also includes the park roads, Towac Way and Mitchells Way, which are managed by NPWS. There are also several management trails in the park, which are not available for public vehicle access.

Figure 1 shows the public vehicle access routes and management trails. All public access roads in the park may be temporarily closed for operational reasons or where access may present a danger to the public.

### **4.2.2 Mount Canobolas summit**

The summit of Mount Canobolas, at 1397 metres above sea level, offers commanding 270-degree views of the surrounding region and is the major visitor destination in the park.

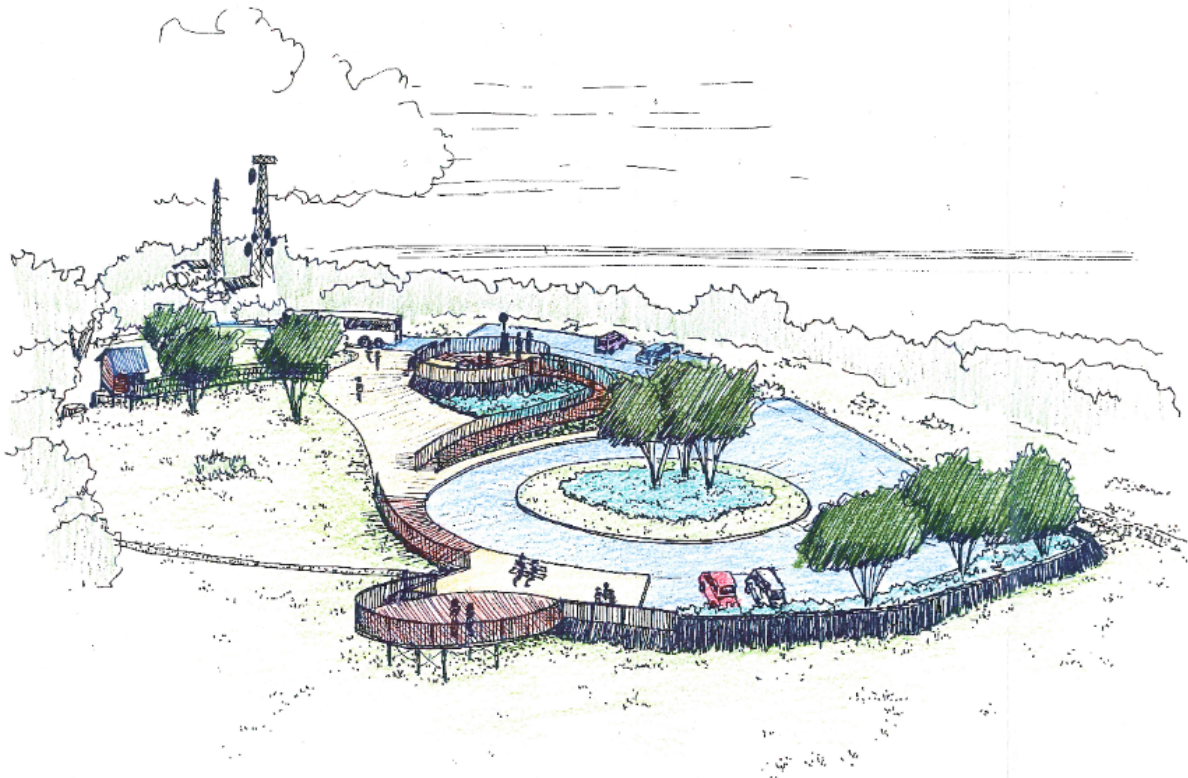
Not all the summit of Mount Canobolas is within the park, with a small inholding of approximately 0.5 hectares (see Figure 2). While this plan only deals with those parts of the Mount Canobolas summit that are part of the park, NPWS will continue to work with the owners of the inholding and of the infrastructure within it.

Park visitor facilities at the summit currently include carparking, a viewing area, a picnic table and an interpretive display. The summit provides direct access to two walking tracks and indirect access to all but one of the other walking tracks in the park.

The present layout of the summit is rather unattractive and uninspiring and the views from the summit are not matched by the presentation of the site itself. This is partly due to the telecommunications infrastructure present. Moreover, for the volume of visitors to the summit, the site provides inadequate facilities.

The Mount Canobolas summit will be redeveloped in a low-key manner to provide an improved visitor experience and improved visitor safety. The redevelopment will improve traffic flow, parking and toilet facilities and provide lookout platforms and interpretive materials. All facilities will be wheelchair accessible.

Significant telecommunications and other infrastructure is located at the summit of Mount Canobolas, both within the park (see Section 6) and the inholding. This infrastructure affects the visual amenity to and from the site and, to a lesser extent, limits recreational opportunities at the summit.



**Figure 3** Artist's impression representative of proposed Mount Canobolas redevelopment, looking south (Out in the Open 2001).

### 4.2.3 Federal Falls Camping Area

Provision of camping sites and facilities in parks allows visitors to have a more in-depth experience.

The Federal Falls Camping Area provides for basic camping and day use and, other than the summit, has become the main visitor site in the park. It is wheelchair accessible. The Federal Falls Camping Area offers campers and day visitors a peaceful bushland setting where they can relax and enjoy the surroundings. It is in the centre of the park and is accessible by two-wheel drive vehicles. Visitors need to bring their own water.

As well as offering camping and day use facilities, the camping area provides a track head for the Federal Falls and Snowgum walking tracks (see Section 4.2.5 and Figure 1).

The Federal Falls Camping Area was redeveloped in 2008–2009 to limit damage to the natural and cultural values at the site. Redevelopment included construction of a new toilet block and carpark and installation of a gas barbeque and shelter, interpretive displays, fireplaces and picnic tables.

### 4.2.4 Day use areas and lookouts

In addition to the Mount Canobolas summit and Federal Falls Camping Area, three day use areas and lookouts will be maintained in the park – The Walls, Orange View and Towac. All are accessible by conventional vehicle. Existing facilities at the poorly drained and little used Tea House Day Use Area, located at the entrance to the park on Mount Canobolas Road, will be removed and the site revegetated, unless the site is used as part of the Orange City Council mountain bike proposal (see Section 4.2.6).

Facilities at The Walls, Orange View and Towac are low-key and restricted to carparking and picnic tables. Visitors need to provide their own cooking facilities and water and remove their rubbish when they leave.

Minor works are required to limit environmental impacts and improve the facilities provided. Proposed works include constructing or formalising carparks, installing vehicle barriers to delineate carparks and installing directional and interpretive signage.

Visitor safety infrastructure at the lookouts and elsewhere throughout the park will be upgraded and or maintained to meet relevant Australian Standards and any NPWS infrastructure guidelines.

Several former visitor nodes have already been closed. Although all infrastructure at these sites has been removed, some locations require further work to stabilise them and to effectively close them to vehicle access. Natural regeneration will be encouraged at these sites but rehabilitation works will be undertaken where necessary.

### 4.2.5 Bushwalking

Bushwalking allows visitors to be in close contact with the environment and can increase understanding and enjoyment of parks and the environment generally.

The walking tracks in the park (see Table 6 and Figure 1) provide a range of length and difficulty. They provide access to a wide area of the park, traversing a variety of vegetation types and lead to some of the park's major natural attractions.

As with all other recreational opportunities, the provision of walking tracks is restricted by potential impacts on the parks natural and cultural values. For example, the Mount Canobolas *Xanthoparmelia* Lichen Community may be vulnerable to disturbance associated with recreational uses such as cycling and walking.



Bushwalker on Mount Towac Track. Photo credit: Boris Hlavica, DPIE.



No new walking tracks are proposed. However, the existing walking tracks and associated track head carparks are in various states of repair and require considerable maintenance, upgrading and, in some cases, rerouting to limit environmental impacts (see Table 6). Very few walkers are using the Hopetoun Falls Track and this track will be closed.

The walking track grades (see Table 6) identify the suitability of a track for different user groups and abilities. All walking tracks in the park are Grade 3, generally being formed tracks with some steep sections, suitable for beginner walkers, although some bushwalking experience is recommended.

**Table 6: Walking tracks in the park**

Name (length)	Description of track and issues	Proposed standard <sup>A</sup> and works
Federal Falls Track (4.1 km)	<p>A challenging loop track accessed from Federal Falls Camping Area. Provides access to Federal Falls.</p> <ul style="list-style-type: none"> <li>The section of track to the base of Federal Falls requires significant work.</li> <li>Erosion occurs in several places.</li> </ul>	<p>Grade 3</p> <p>Upgrade section to base of waterfall with new steps and handrails.</p> <p>Install steps on other steep sections.</p> <p>Reroute as required.</p> <p>Install warning signs and/or safety fencing where required.</p> <p>Install directional signage.</p>
Nature Track (2.0 km loop)	<p>A loop walk accessed from The Walls Day Use Area or via Summits Track. Provides excellent views and can be combined with the Summits Track to provide a longer walk.</p> <ul style="list-style-type: none"> <li>Some steep sections are eroding.</li> <li>Sections have been rerouted to avoid impacts on the endangered lichen ecological community.</li> </ul>	<p>Grade 3</p> <p>Reroute and or install steps on steep sections.</p> <p>Reroute any sections affecting the endangered lichen ecological community.</p> <p>Install directional signage.</p>
Summits Track (1.0 km one way)	<p>Connects the summit of Mount Canobolas or Old Man Canobolas with the summit of Young Man Canobolas. This track connects with the Nature Track, Snowgum Track and Spring Glade Track.</p> <ul style="list-style-type: none"> <li>The descent to the saddle from Mount Canobolas and the ascent to Young Man Canobolas are badly eroded.</li> </ul>	<p>Grade 3</p> <p>Remediate erosion and install steps. Where necessary reroute steeper sections.</p> <p>Ensure track does not affect the endangered lichen ecological community.</p> <p>Install directional signage.</p>
Spring Glade Track (1.0 km one way)	<p>Spring Glade Track ascends towards the summit of Mount Canobolas. It is a fairly easy walk that connects with the Summits Track to provide access to the Mount Canobolas summit and to the Nature Track.</p> <ul style="list-style-type: none"> <li>Lower section is badly eroded.</li> </ul>	<p>Grade 3</p> <p>Remediate erosion and where necessary reroute the lower section.</p> <p>Formalise track head carpark on Mount Canobolas Road.</p> <p>Install directional signage.</p>

Name (length)	Description of track and issues	Proposed standard <sup>A</sup> and works
Mount Towac Track (0.65 km one way)	Short walking track to the summit of Mount Towac. Access is along Gum Ridge Trail, approximately 250 metres from Towac Way. <ul style="list-style-type: none"> <li>Erosion occurs in several places.</li> </ul>	Grade 3 Formalise carpark at junction of Towac Way and Gum Ridge Trail. Install additional steps and drains to address erosion. Install directional signage.
Snowgum Track (0.7 km one way)	A short track connecting the Mount Canobolas summit with the Federal Falls Camping Area. Steep in some sections. <ul style="list-style-type: none"> <li>Some steep sections are eroding.</li> </ul>	Grade 3 Reroute and/or install steps on steep sections. Install directional signage.

<sup>A</sup> The Australian Walking Track Grading System has been used as the basis for this track classification system. For further information on these grades and their relationship to the Australian Standard please refer to the *Users Guide to the Australian Walking Track Grading System* (DSE no date).



The Nature Track. Photo credit: Helmut Bernt.

#### 4.2.6 Cycling and mountain biking

**Cycling** can be an exciting, healthy and environmentally sustainable way of exploring the road and trail network of the park. In accordance with NPWS policy, cycling is generally permitted on park roads and on management trails in state conservation areas.

Cycling along the network of public roads, park roads and the management trails shown on Figure 1 is an appropriate use as it is not likely to negatively affect park values. The cycling participation rate in New South Wales increased approximately 17% between 2005 and 2015 and, although not part of the park, road cyclists are increasingly using the steep slopes of Mount Canobolas Road to test and improve their climbing ability.

**Mountain biking** has also grown in popularity in the local area and across New South Wales, and mountain biking opportunities, including the provision of mountain bike single-tracks, are being considered for the park. Single-tracks are narrow, often winding tracks only wide enough to accommodate riders in single file.

In 2016, Orange City Council prepared a concept plan to develop a substantial network of mountain bike single-track within the park and on adjoining lands (World Trail Pty Ltd 2016). This concept plan proposes some 63 kilometres of mountain bike single-track in the park, traversing much of the park except for the most environmentally sensitive 'no go' areas east of The Walls Day Use Area. The concept plan also proposes the development of a hub or track head at, or near, the Tea House Day Use Area, located at the entrance to the park on Mount Canobolas Road, to provide riders with facilities such as a café or kiosk, toilets and services such as bike hire, transport shuttles and visitor information. An additional 54 kilometres or more of single-track is proposed for lands adjacent to the park, principally in the adjoining Canobolas and Glenwood state forests.

Orange City Council commissioned an economic assessment for the proposal, which forecast the project would attract 50,000 people each year from its fifth year of operation. If the proposal were to proceed, visitor facilities in the park, such as carparks and toilets, would need to expand to manage the forecast increase in visitors and use and to limit adverse environmental, social and visitor safety impacts.

The plan of management enables the detailed planning and construction of the proposals in the concept plan if conditions are met. These conditions include environmental impact assessment (natural, cultural and social assessment under the *Environmental Planning and Assessment Act 1979*) under state and federal legislation, compliance with NPWS policies and public consultation on the final design.

The concept plan may be adjusted as engineering, environmental and other information arises during the design process. However, any facilities constructed must be consistent with the final version of the design approved by the environmental impact assessment process.

Significant future facility upgrades may only be implemented following update of the concept plan, environmental impact assessment, public consultation and review by NPWS.

Any proposal for the construction of mountain biking single-track and other facilities in the park would be required to meet the *OEH Cycling policy* (OEH 2018), the *Sustainable Mountain Biking Strategy* (OEH 2011) and relevant components of the *Sustainability Assessment Criteria for Visitor Use and Tourism in New South Wales National Parks* (DECCW 2011).

In line with NPWS policy and the *Sustainable Mountain Biking Strategy* (OEH 2011), NPWS will assess proposed mountain biking experiences against a set of planning, development and management criteria, including:

- the ecological sustainability of the proposal
- the appropriateness of the location
- the quality of the experience for cyclists
- the need to balance competing visitor demands
- opportunities and demand for cycling across the region, including on other tenures
- visitor safety
- the availability of resources to provide and maintain the experience.

Any proposal for development of mountain biking facilities on park would also need to include support facilities to cater for the expected increased visitor demand, for example expanded carparks and toilets at track heads.

The proposal will also be required to undergo broad public consultation prior to approval and implementation.

If implemented, this proposal will be undertaken by Orange City Council under an agreement with NPWS. Section 151 of the National Parks and Wildlife Act provides for the grant of leases or licences, including a lease or licence to enable activities of a recreational nature and the provision of facilities for that purpose. New agreements for any lease or licence of land, buildings or structures within the park for the purposes of visitor facilities, including mountain bike riding facilities, would be considered as required in accordance with Part 12 of the National Parks and Wildlife Act and the NPWS Property Leasing Guidelines. Before granting a lease or licence, the Minister must be satisfied of the matters identified in section 151B of the National Parks and Wildlife Act. These include: the site suitability and compatibility of the proposal with the natural and cultural values; the sustainable and efficient use of natural resources, energy and water; and the appropriate form and scale of any new building or structures. These criteria are set out in the *Sustainability Assessment Criteria for Visitor Use and Tourism in New South Wales National Parks* (DECCW 2011).

The maintenance and management of any mountain biking single-track facilities will be in accordance with a track management plan that resolves any environmental, safety and social aspects of track use and maintenance. If facilities are operated by a third party, the track management plan will be agreed with the proponent and be part of any authorisation under the National Parks and Wildlife Act.

Licensed operators may provide commercially guided mountain bike tours in the park, including on established single-track under consent and subject to conditions that will help to regulate user numbers, minimise potential conflicts with other users, enhance opportunities for environmental awareness and education and minimise risks to the safety of inexperienced riders. All commercial groups, irrespective of size, require consent. Similarly, all organised events (e.g. club-based events) also require consent. Non-commercial or recreational groups of more than six riders also require consent. This will assist NPWS to limit impacts.

Proposals for large scale events in the park will be assessed on their merits under operating NPWS policy and guidelines.

As with roads and walking tracks in the park, NPWS may impose temporary closures on mountain biking tracks and facilities to limit environmental impacts or risks to visitor safety. For example, NPWS may close tracks during or after rain or snowfall, when wildfire threatens or at times of very high fire danger or during other park operations, such as hazard reduction burning, weed spraying and some pest control programs.

Power-assisted pedal cycles, commonly known as e-bikes or pedelecs, up to the output of 250 watts, will only be allowed on management trails in the park.



Day visitors at the Federal Falls Camping Area. Photo credit: Boris Hlavica, DPIE.

### 4.2.7 Horse riding

Horse riding is a popular recreational activity that has cultural associations for many Australians.

In the park, horse riding has tended to be low-key and infrequent, consisting of individuals, small groups and the occasional organised club event. Most horse riding has occurred on the public and park roads and along Gum Ridge Trail in the south-west of the park.

Most organised longer rides are conducted through the surrounding state forests using Gum Ridge Trail as a short-cut to gain access to the base of Federal Falls via the state forest road network. There is no evidence of damage being caused by this low-frequency activity. Horse riding will continue to be permitted in the park subject to restrictions on the number and size of groups, designated routes and frequency of organised group rides. These restrictions will reflect previous patterns of use.

Horse riding will only be allowed on park roads (Mitchells Way and Towac Way) and designated management trails (i.e. Gum Ridge, Glider and Pine Ridge trails), as shown on Figure 1. Horse riding will not be allowed on walking tracks or off-track. Horses and horse riding will not be allowed in camping or day use areas.

The topography and limited trails mean the park is not generally considered suitable for horse riding events or commercial horse riding activities. However, select use of the park by events being run in areas adjoining the park will be considered.

Organised club events, with appropriate public risk insurance, require consent, irrespective of the size of groups. Other non-organised recreational groups of more than six horses also require consent. Although a general maximum of 16 horses is permitted on any ride, organised club events may be permitted to use other management trails on a limited basis of 1–2 events each year and may cater for groups larger than 16 horses.

### 4.2.8 Fossicking

The Department of Planning and Environment – Resources and Geoscience regulates fossicking in New South Wales. The park is within the Cabonne Local Government Area fossicking district, which means fossickers would not be required to seek consent from mineral exploration licence holders (see Section 2.1.1). There have been no applications made for fossicking in the park since it was reserved.

Fossicking could adversely impact the values of the park, particularly on steep slopes and in those areas where the endangered Mount Canobolas *Xanthoparmelia* Lichen Community occurs (see Section 2.2.1 and Box 1). Given the depth of the mineral deposits, the steep slopes of the park and the potential for disturbance to the threatened lichen community, fossicking will not be allowed in the park.

#### **4.2.9 Group activities – commercial and non-commercial**

Group activities can provide opportunities for people who would otherwise not be able to experience the park and can promote environmental understanding and support for conservation. Large groups can, however, have an environmental impact and can restrict opportunities for independent visitors.

Commercial tourism increases the opportunity for public participation in nature-based activities and provides opportunities for professional instruction in the safety and minimal impact aspects of various recreational pursuits.

Demand to conduct commercial operations in the park has been low. Only a small number of commercial operators are currently licensed to undertake tours in the park. Minimal impact activities and or activities that promote appreciation and understanding may be considered for commercial licensing. As Mount Canobolas is a focal point for Orange and surrounding districts, activities linked to local festivals may also be permitted.

The annual Great Volcanic Mountain Challenge is an 11-kilometre walk and fun run from the Pinnacle (outside the park) to the summit of Mount Canobolas via Mount Towac and Young Man Canobolas using park roads and walking tracks. The inaugural event was held in 2006 and this annual, licensed event now attracts many hundreds of entrants. The event is limited to a maximum of 1000 participants. Limited parking and narrow roads have led the organisers to use buses to transport participants from the finish at the summit of Mount Canobolas back to the starting area.

Organised group activities of a commercial nature require licensing under the National Parks and Wildlife Regulation.

Under the National Parks and Wildlife Regulation, NPWS consent is also required for 'large' non-commercial organised group activities or gatherings, and for competitive events, training exercises or adventure activities of any size. This recognises the fact that certain activities and large groups can have a significant impact on parks, their wildlife, other users and park neighbours.

The definition of a large group varies according to the activity and its location. Consequently, those participating in activities with the potential for higher impacts will need to have smaller group sizes than those involved in activities with lower impacts.

All activities must be consistent with the management principles of the park and be compatible with the natural and cultural heritage values of the park. Applications will be assessed in accordance with relevant NPWS policies and procedures.



Bushwalkers at Mount Towac. Photo credit: Boris Hlavica, DPIE.

## 5. NPWS infrastructure and services

NPWS aims to ensure that park infrastructure and assets are necessary and strategically and operationally efficient. NPWS will assess the types, location and quality of NPWS infrastructure provided, considering factors such as the relevance and performance of assets, and will determine priorities for asset management. This may lead to further capital investment, bringing existing assets up to current standards, maintaining assets at standard, or the decommissioning or disposal of assets (OEH 2015).

In Mount Canobolas State Conservation Area, NPWS is responsible for visitor facilities such as park roads, day use and camping areas, lookouts and walking tracks and park signage (see Section 4). NPWS is also responsible for assets that are integral to management of the park such as management trails, park gates, boundary fencing and water tanks.

A network of **management trails** is maintained for fire management, pest animal and weed control, monitoring and research and emergency access (see Figure 1). Standards for these trails varies with their strategic classification (NSW RFS 2017), which is identified in the park fire management strategy (OEH 2014b). NPWS will work with the Rural Fire Service and Forestry Corporation of NSW to investigate and, if appropriate, construct an additional management trail on the western side of the park (see Section 2.2.4).

Sections of the **boundary fence** with neighbouring properties have been replaced since reservation. Although not required under the *Dividing Fences Act 1991*, NPWS encourages a cooperative approach towards sharing fencing responsibilities. NPWS has provided fencing material to neighbours to support boundary fencing. Current fences are generally in good repair and their condition will be monitored over time. However, some sections of the boundary fence are in poor condition and allow neighbouring livestock to enter the park. NPWS will work with neighbours to maintain the park in a stock-proof condition.

Boundary **gates** are strategically located to provide authorised access for park management, such as fire management. They restrict public vehicle access to some management trails to ensure the trails remain serviceable for park management activities and to maintain visitor experiences for walkers, cyclists, horse riders and other non-motorised users. Unauthorised access associated with illegal activities can have a negative impact on the environmental values of the reserves and neighbouring property and assets.

Measures to reduce the environmental impacts associated with unauthorised entry into the park may include gating and locking vehicle access points, maintaining boundary fencing and compliance and enforcement programs, including cooperative programs with police and the local council.

Two large **water tanks** are located in the park and are principally used as water supplies for firefighting and weed control.



## 6. Non-NPWS infrastructure and services

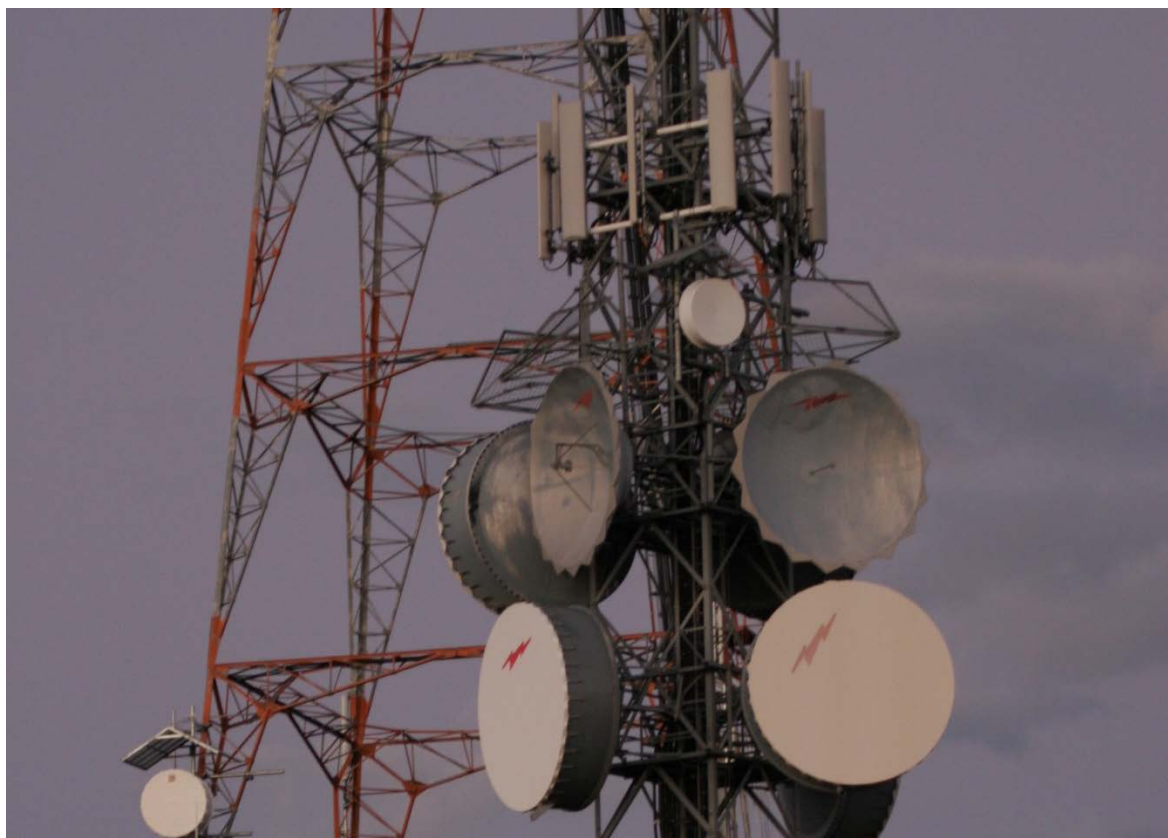
Mount Canobolas State Conservation Area, like many other state conservation areas, national parks and nature reserves, contains a variety of infrastructure or assets that are owned, operated and maintained by other parties. All such uses must be authorised to occupy and use the park, to ensure appropriate management arrangements are in place.

A substantial amount of **telecommunication infrastructure** has been installed on the summit of Mount Canobolas. The towers and associated buildings contain or facilitate a wide range of services, including television, radio, telephone, mobile phone, emergency services, private radio networks and air navigation beacons. The towers on the northern side are within the park, whereas the towers on the southern side are located on an inholding of Commonwealth land and not within the park.

Several organisations manage the telecommunications infrastructure and associated power supply. Leases are in place for all major telecommunications providers.

To limit further impacts on the visual amenity, additional towers will not be constructed in the park unless there are no feasible alternatives. Construction of any new buildings or other ground structures for telecommunications infrastructure will only be permitted within the existing fenced compounds at the summit of Mount Canobolas.

Existing trenching on the summit of Mount Canobolas has capacity for installation of additional underground **optical fibre cables**. New trenching for underground optical fibre cables will only be permitted at the summit once existing trenching have reached capacity.



Telecommunications tower at Mount Canobolas State Conservation Area. Photo credit: Rosie Nicolai, DPIE.

An overhead **powerline** supplies the telecommunications infrastructure on the summit of Mount Canobolas. This enters the park from the north, generally following Old Canobolas Road. Upslope of Mount Canobolas Road, a naturally surfaced four-wheel drive trail runs adjacent to the powerline to the summit. This management trail (shown as Powerline Trail on Figure 1) will be retained for powerline maintenance and park management purposes.

Underground ducting has already been installed from Mount Canobolas Road to the summit and partial or complete burial of the powerline will be encouraged for fire protection and management. Burial of the powerline may be undertaken where it is deemed appropriate, necessary and environmentally acceptable.

Another powerline enters the park from the east, providing power to the private property inholding (see Figure 1).

Easement and maintenance agreements for these powerlines through the park, and for the associated substation on the summit, will be established with the electricity supply authority.

All infrastructure construction works and any associated works involving ground disturbance will be subject to environmental impact assessment.

# Appendices

## Appendix 1 Legislation and policy

The following laws and policies apply to how we manage our parks (this is not a complete list):

### NSW legislation

- *National Parks and Wildlife Act 1974* and NPW Regulation
- *Environmental Planning and Assessment Act 1979*
- *Biodiversity Conservation Act 2016*
- *Heritage Act 1977*
- *Work Health and Safety Act 2011*
- *Local Land Services Act 2013*

### Commonwealth legislation

- *Environment Protection and Biodiversity Conservation Act 1999*

### NPWS policies and strategies

A range of NPWS policies and strategies may also apply to park management:

- Park management policies – <http://www.environment.nsw.gov.au/topics/parks-reserves-and-protected-areas/park-policies>
- Regional pest management strategies – <http://www.environment.nsw.gov.au/pestsweeds/RegionPestManagement.htm>
- Fire management strategies – <http://www.environment.nsw.gov.au/topics/parks-reserves-and-protected-areas/fire/fire-management-strategies>

Other laws, policies and strategies may also apply; please contact NPWS for advice.

## Appendix 2 Scientific names of native plants and animals mentioned in the text

Abbreviation	Meaning
BC Act	<i>Biodiversity Conservation Act 2016</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
V	Vulnerable
CE	Critically Endangered

### Native plants

Common name	Scientific name	Status	
		BC Act	EPBC Act
	<i>Asterolasia rupestris</i> subsp. <i>rupestris</i>		
	<i>Prostanthera gilesii</i>	CE	
Apple box	<i>Eucalyptus bridgesiana</i>		
Black sallee	<i>Eucalyptus stellulata</i>		
Blackwood	<i>Acacia melanoxylon</i>		
Blakely's red gum	<i>Eucalyptus blakelyi</i>		
Brittle gum	<i>Eucalyptus mannifera</i>		
Broad-leaved peppermint	<i>Eucalyptus dives</i>		
Candlebark	<i>Eucalyptus rubida</i> subsp. <i>rubida</i>		
Common fringe-myrtle	<i>Calytrix tetragona</i>		
Dean's wattle	<i>Acacia deanei</i>		
Erect guinea flower	<i>Hibbertia riparia</i>		
Green wattle	<i>Acacia irrorata</i> subsp. <i>irrorata</i>		
Hill fireweed	<i>Senecio hispidulus</i>		
Hoary guinea flower	<i>Hibbertia obtusifolia</i>		
Long-leaved box	<i>Eucalyptus goniocalyx</i>		
Mountain gum	<i>Eucalyptus dalrympleana</i> subsp. <i>dalrympleana</i>		
Mountain mirbelia	<i>Mirbelia oxylobioides</i>		
Myrtle tea-tree	<i>Leptospermum myrtifolium</i>		
Narrow-leaved peppermint	<i>Eucalyptus radiata</i> subsp. <i>radiata</i>		
Red box	<i>Eucalyptus polyanthemos</i> subsp. <i>polyanthemos</i>		
Red stringybark	<i>Eucalyptus macrorhyncha</i>		
Ribbon gum	<i>Eucalyptus viminalis</i>		
Scaly phebalium	<i>Phebalium squamulosum</i>		

Common name	Scientific name	Status	
		BC Act	EPBC Act
Sifton bush	<i>Cassinia arcuata</i>		
Silver-leaf candlebark	<i>Eucalyptus canobolensis</i>	V	E
Snow gum	<i>Eucalyptus pauciflora</i>		
Snowgrass	<i>Poa sieberiana</i>		
Spinning gum	<i>Eucalyptus perriniana</i>		
Sticky cassinia	<i>Cassinia uncata</i>		
Sticky hop-bush	<i>Dodonaea viscosa</i>		

### Native animals

Common name	Scientific name	Status	
		BC Act	EPBC Act
<b>Birds</b>			
Dusky woodswallow	<i>Artamus cyanopterus cyanopterus</i>	V	
Flame robin	<i>Petroica phoenicea</i>	V	
Grey currawong	<i>Strepera versicolor</i>		
Little eagle	<i>Hieraaetus morphnoides</i>	V	
Scarlet robin	<i>Petroica boodang</i>	V	
Varied sittella	<i>Daphoenositta chrysoptera</i>	V	
<b>Mammals</b>			
Agile antechinus	<i>Antechinus agilis</i>		
Eastern bentwing-bat	<i>Miniopterus schreibersii oceanensis</i>	V	
Greater glider	<i>Petauroides volans</i>		V
Yellow-bellied glider	<i>Petaurus australis</i>	V	
Yellow-bellied sheath-tail-bat	<i>Saccolaimus flaviventris</i>	V	
<b>Invertebrates</b>			
Mount Canobolas velvet worm	<i>Cephalofovea pavimenta</i>		
Mount Canobolas flatworm	Undescribed species		

## Appendix 3 Vegetation communities of the park

Common name and description	Values
<b>Snow gum – mountain gum grassy woodlands and tall open forests</b>	
<p>Covers 52% of the park.</p> <p>Found at higher altitudes (above 900 metres above sea level) or in protected areas dominating the central parts of the park. Soils vary but are primarily chocolate brown.</p> <p>As well as snow gum and mountain gum other canopy species include silver-leaf candlebark, ribbon gum, brittle gum, narrow-leaved peppermint, broad-leaved peppermint, red box, long-leaved box, blackwood and green wattle.</p> <p>Tall open forests (up to 50 metres tall) dominated by mountain gum and ribbon gum are associated with creek lines with deep soils. Grassy woodlands dominated by snow gum and silver-leaf candlebark occur on upper slopes and crests on primarily shallow soils.</p>	<p>This community includes the Tablelands Snow Gum Grassy Woodland and the Tableland Basalt Forest endangered ecological communities.</p> <p>Likely to be at the north-western limit of its distribution.</p> <p>The woodland community has been dramatically affected by an intense fire in 1985, which has resulted in a massive germination of a cohort of snow gum.</p>
<b>Stringybark – peppermint shrubby open forests and woodlands</b>	
<p>Covers 26% of the park.</p> <p>Found primarily on shallow but moist soils, from 1000 to 1340 metres above sea level.</p> <p>On less exposed sites, the community is dominated by broad-leaved peppermint and is 20–30 metres tall. On drier, more exposed sites, the community is dominated by red stringybark and only reaches heights of 15–20 metres.</p> <p>A wide range of associated canopy species includes silver-leaf candlebark, mountain gum, snow gum, apple box, candlebark, narrow-leaved peppermint, Blakely's red gum, green wattle and blackwood.</p>	<p>Although widespread and well conserved, with occurrences in the Blue Mountains, Kanagra Boyd and Kosciusko national parks and parks in Victoria, the occurrence in the park is significant owing to the unusual assortment of associated species and the community being at its north-western geographical limit.</p>
<b>Grasslands and grassy open woodlands</b>	
<p>Covers 15% of the park.</p> <p>Found above 1200 metres altitude on shallow moist soils. Examples are usually small and patchily distributed within the snow gum – mountain gum grassy woodlands and tall open forests community.</p> <p>Where present, trees within this community may include snow gum, silver-leaf candlebark, mountain gum, blackwood, green wattle and Dean's wattle.</p> <p>Shrubs such as sticky cassinia and sifton bush occur occasionally.</p> <p>Snowgrass dominates the ground cover.</p>	<p>Across much of its range, this community has been cleared for agriculture or degraded by grazing and inappropriate fire regimes. It is poorly conserved across its range.</p> <p>This community includes the Tablelands Snow Gum Grassy Woodland endangered ecological community.</p>

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**Outcrop low open woodlands**

Covers approximately 4% of the park.  
 Distribution scattered and disjunct through the park, from 1100 to 1360 metres altitude. Soils are always skeletal.  
 Where present, the tree canopy is low (5–10 metres tall) and consists of silver-leaf candlebark, mountain gum and green wattle.  
 Shrubs present include sticky cassinia, scaly phebalium, mountain mirbelia, sticky hop-bush, myrtle tea-tree and hoary guinea flower.  
 Soil development and time since fire affect this community. Where there is little or no soil development, or where there are no substantial cracks in exposed rock, shrubs do not develop or at least do not form dense stands. Trees can invade where there is soil development and or at rock outcrops with a lowered frequency of fires.

This community is vulnerable to inappropriate fire regimes and to trampling by people.

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**Outcrop heaths and shrublands**

Covers approximately 2% of the park.  
 Found as highly disjunct and small patches throughout the park, on skeletal soils.  
 Shrub layer is 1–3 metres tall and includes common fringe-myrtle, mountain mirbelia, sticky cassinia and erect guinea flower.  
 Where little or no soil development occurs, or where there are no substantial rock cracks, shrubs do not develop or do not form dense stands.  
 Frequent fire may decrease shrub cover and increase development of fire-tolerant herbaceous vegetation making this community more like Outcrop low open woodlands.

Likely to be wholly restricted to the park and its surrounds.  
 Vulnerable to inappropriate fire regimes and disturbance by people.  
 Contains unique bryophyte communities, including the endangered Mount Canobolas *Xanthoparmelia* Lichen Community, which occurs on rock faces and shallow soils on rock pavements.

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**Waterfall low open woodlands**

Covers less than 1% of the park.  
 Patches occur at Federal and Hopeton falls.  
 Primarily an open shrubland with an assortment of herbs. Stunted long-leaved box occurs where soil development is better, particularly on the margins of exposed rock surfaces.  
 The scree slopes at the base of the falls have the occasional taller ribbon gum, a few shrubs and a dense ground cover of hill fireweed.

Blackberry is a serious problem within this community.

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**Disturbed creeklines**

Covers 1% of the park.  
 Highly disturbed creek lines occur in the lower reaches of Towac Creek and a minor creek line that leaves the north-eastern corner of the park.  
 Dominant tree species include ribbon gum, black sallee, snow gum and mountain gum.

As its name suggests, this community is highly disturbed and infested by weeds and requires substantial management effort.  
 It is the only community in the park in which black sallee occurs.

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Source: Hunter (2000, 2002).

## Abbreviations

Abbreviation	Meaning
BC Act	<i>Biodiversity Conservation Act 2016</i>
EEC	Endangered ecological community
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
NPW Act	<i>National Parks and Wildlife Act 1974</i>
NPWS	National Parks and Wildlife Service
NSW	New South Wales

## Glossary

The terms listed in this glossary have specific meanings in this document.

Term	Definition
Asset protection zone	Area where the overall fuel hazard is maintained at moderate or below, often by mechanical means (e.g. mowing or slashing). The objective of an asset protection zone is to protect human life and property, and this objective takes precedence over biodiversity conservation in these zones.
Land management zone	Area of land zoned to meet relevant land management objectives.
Management trail	Vehicle trail that forms part of the park, maintained by NPWS for park management purposes. These trails are not available for public vehicle access. They are available for public use by walkers and cyclists, and some are available for use by horse riders.
Park road	Road that forms part of the park, maintained by NPWS for public vehicle access.
Public road	Road that is not part of the park and maintained by NSW Roads and Maritime Services or a local council for public vehicle access.
Single-track	A narrow track for cycling, only wide enough to accommodate riders in single file.
Single-use track	A track that is only available for one type of use only, for example, a walking track that is for use by walkers only.



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