



NSW NATIONAL PARKS & WILDLIFE SERVICE

# Crawney Pass National Park Community Conservation Area Zone 1

Plan of Management



© 2019 State of NSW and Department of Planning, Industry and Environment

With the exception of photographs, the State of NSW and Department of Planning, Industry and Environment are pleased to allow this material to be reproduced in whole or in part for educational and non-commercial use, provided the meaning is unchanged and its source, publisher and authorship are acknowledged. Specific permission is required for the reproduction of photographs.

The Department of Planning, Industry and Environment (DPIE) has compiled this report in good faith, exercising all due care and attention. No representation is made about the accuracy, completeness or suitability of the information in this publication for any particular purpose. DPIE shall not be liable for any damage which may occur to any person or organisation taking action or not on the basis of this publication. Readers should seek appropriate advice when applying the information to their specific needs.

All content in this publication is owned by DPIE and is protected by Crown Copyright, unless credited otherwise. It is licensed under the [Creative Commons Attribution 4.0 International \(CC BY 4.0\)](#), subject to the exemptions contained in the licence. The legal code for the licence is available at [Creative Commons](#).

DPIE asserts the right to be attributed as author of the original material in the following manner: © State of New South Wales and Department of Planning, Industry and Environment 2019.

**This plan of management was adopted by the Minister for the Environment on 8 August 2019.**

The Department acknowledges that Crawney Pass National Park is in the traditional Country of the Wanaruah and Nungaroo peoples.

This plan of management was prepared by the NSW National Parks and Wildlife Service (NPWS), part of the Department of Planning, Industry and Environment.

For additional information or any inquiries about this park or this plan of management, contact NPWS Upper Hunter Area Office at 20 Hayes Street, Scone NSW 2337, or by telephone on (02) 6540 2300.

Cover photo: Nundle cycad (*Macrozamia concinna*). DPIE

Published by:

Environment, Energy and Science  
Department of Planning, Industry and Environment  
59 Goulburn Street, Sydney NSW 2000  
PO Box A290, Sydney South NSW 1232  
Phone: +61 2 9995 5000 (switchboard)  
Phone: 1300 361 967 (Environment, Energy and Science enquiries)  
TTY users: phone 133 677, then ask for 1300 361 967  
Speak and listen users: phone 1300 555 727, then ask for 1300 361 967  
Email: [info@environment.nsw.gov.au](mailto:info@environment.nsw.gov.au)  
Website: [www.environment.nsw.gov.au](http://www.environment.nsw.gov.au)

Report pollution and environmental incidents  
Environment Line: 131 555 (NSW only) or [info@environment.nsw.gov.au](mailto:info@environment.nsw.gov.au)  
See also [www.environment.nsw.gov.au](http://www.environment.nsw.gov.au)

ISBN 978-1-922317-00-1  
EES 2019/0485  
September 2019

Find out more about your environment at:

**[www.environment.nsw.gov.au](http://www.environment.nsw.gov.au)**

# Contents

1. INTRODUCTION .....	1
1.1 Location, reservation and regional setting .....	1
1.2 Statement of significance .....	2
2. MANAGEMENT CONTEXT .....	3
2.1 Legislative and policy framework.....	3
2.2 Management purposes and principles.....	3
2.3 Specific management directions.....	4
3. VALUES .....	5
3.1 Geology, landscape and hydrology .....	5
3.2 Native plants .....	6
3.3 Native animals .....	8
3.4 Aboriginal heritage .....	10
3.5 Historic heritage .....	11
3.6 Visitor use .....	12
3.7 Information and education.....	13
4. THREATS.....	14
4.1 Pests.....	14
4.2 Fire .....	16
4.3 Climate change .....	17
4.4 Isolation and fragmentation .....	18
5. MANAGEMENT OPERATIONS AND OTHER USES.....	19
5.1 Access .....	19
5.2 Boundary fencing and adjustment .....	20
6. IMPLEMENTATION.....	21
REFERENCES .....	24

## FIGURES

Figure 1: Crawney Pass National Park .....	ii
--	----

## TABLES

Table 1: Significant plant species recorded in Crawney Pass National Park .....	7
Table 2: Threatened animals recorded in or within 2 kilometres of the park.....	8
Table 3: Weed and pest animals recorded in the park .....	15
Table 4: Hunter climate change snapshot.....	17
Table 5: List of management responses .....	21

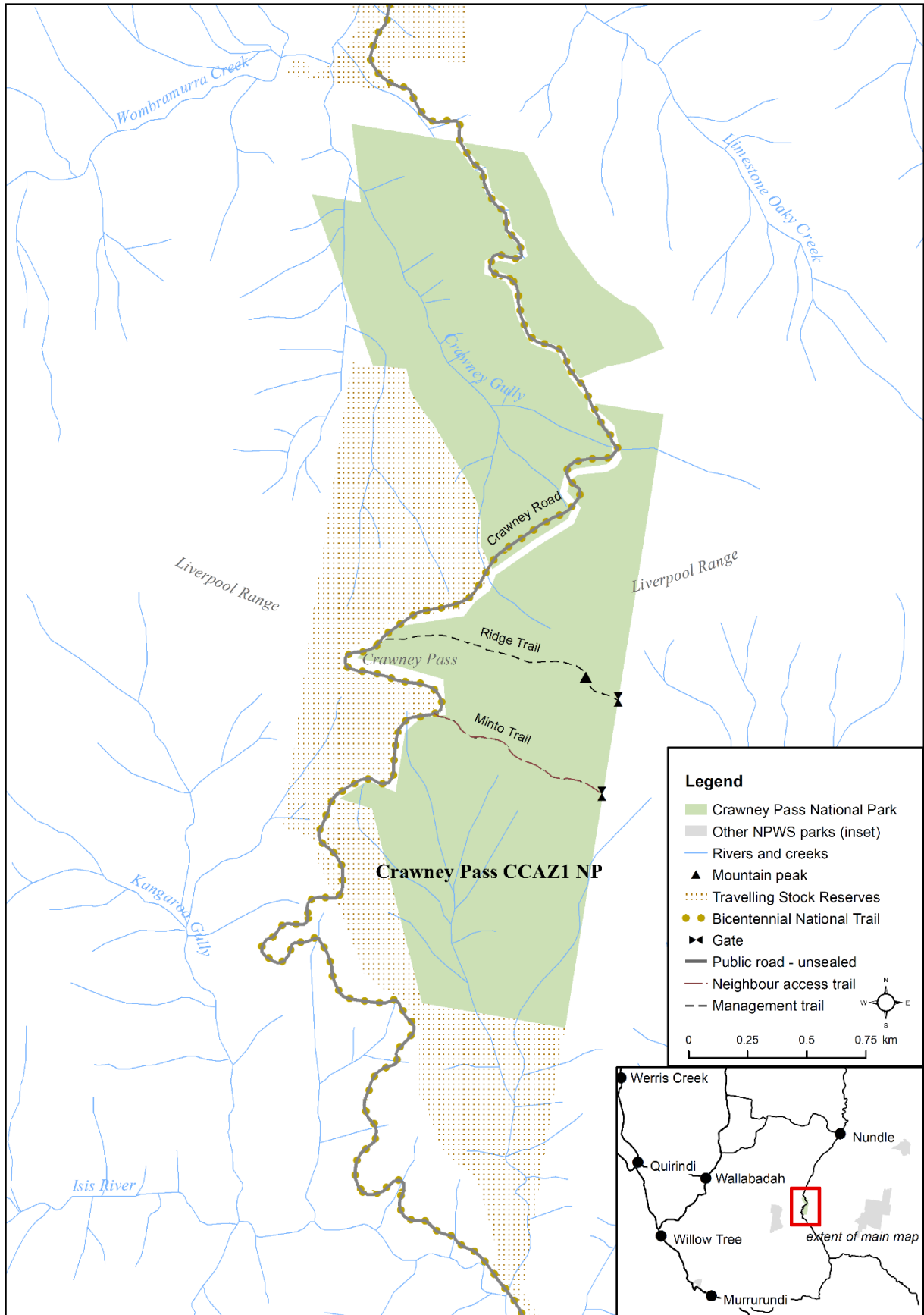


Figure 1: Crawney Pass National Park

# 1. Introduction

## 1.1 Location, reservation and regional setting

Features	Description
Location	Crawney Pass National Park Community Conservation Area Zone 1 (referred to as 'the park') is located atop the Liverpool Range. To the north, the park drains into the Murray–Darling Basin and to the south it drains to the coast via the Hunter River. It is 22 kilometres south-west of Nundle, 70 kilometres south of Tamworth and 70 kilometres north-east of Scone.
Reservation date	1 December 2005
Area	<p>The park is 310.8 hectares, including 61.8 hectares that were added to the park in May 2018. The park has a linear shape, approximately four kilometres long and between 300 metres and one kilometre wide (see Figure 1).</p> <p>The park also includes unreserved lands which are vested in the Minister administering the <i>National Parks and Wildlife Act 1974</i> (NPW Act) under Part 11 of that Act. These Part 11 lands include a road, namely Minto Trail, which ensures continued access to neighbouring land (see Figure 1 and Section 5.1).</p> <p>The existing national park and Part 11 lands are collectively referred to as 'the park' in this plan of management.</p>
Previous tenure	<p>Most of the national park was formerly Crown land and subject to grazing. The private land acquired in 2013 and added to the north-east of the park in 2018 had been subject to some clearing and was also previously grazed.</p> <p>The park takes its name from the Great Dividing Range crossing between the headwaters of the Peel and Isis rivers, known as Crawney Pass.</p>
<b>Regional context</b>	
Biogeographic region	About 80% of the park is in the NSW North Coast Bioregion (Thackway & Cresswell 1995), and the other 20% in the northern section of the park is in the Nandewar Bioregion. The park is part of a network of conservation reserves located on the Liverpool Range that includes Coolah Tops, Murrurundi Pass and Towarri national parks and Ben Halls Gap, Cedar Brush, Wallabadah and Wingen Maid nature reserves.
Surrounding land use	Partially cleared private lands surround the park to the north and east. The travelling stock reserves adjoining the park's western and southern boundaries (see Figure 1) are well-vegetated, with tributaries feeding into the Isis River and Wombramurra Creek. The travelling stock reserve situated 150 metres north of the park is also well-vegetated. The steep terrain has probably assisted in protecting the park from past land clearing. The park is located four kilometres east

<b>Features</b>	<b>Description</b>
	of Wallabadah Nature Reserve and 10 kilometres west of Ben Halls Gap Nature Reserve.
Other authorities	Crawney Pass National Park is in the administrative areas of the Wanaruah and Nungaroo local Aboriginal land councils, Hunter Local Land Services (LLS), North West LLS, and Tamworth Regional and Upper Hunter Shire councils.

## **1.2 Statement of significance**

Crawney Pass National Park is significant because of its natural and cultural values.

### **Landscape and catchment values**

The park encompasses an area of steep topography and terraced landscape with scenic values typical of the Liverpool Range. It protects the headwaters of the Isis and Peel rivers. The park is part of a regional corridor providing habitat connectivity along the Liverpool Range and is also located within the broader Great Eastern Ranges Initiative conservation corridor.

### **Biological values**

The park protects habitat for 13 threatened native animal species and three plant species of conservation significance. Of particular significance is a population of Booroolong frog recorded in the park. This frog has experienced massive population declines in parts of its range and is now highly restricted within New South Wales.

### **Historic heritage values**

The area is significant as one of the first locations along the Liverpool Range traversed by Major Mitchell in 1825, allowing for subsequent settlement, trade and development.

## 2. Management context

### 2.1 Legislative and policy framework

The management of community conservation areas in New South Wales is in the context of a legislative and policy framework, primarily the National Parks and Wildlife Act and Regulation, the Community Conservation Area Agreement developed under the *Brigalow and Nandewar Community Conservation Area Act 2005*, the *Biodiversity Conservation Act 2016* and the policies of NSW National Parks and Wildlife Service (NPWS).

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

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

### 2.2 Management purposes and principles

#### Community conservation areas

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

#### Zone 1 national parks

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

Under section 30E of the National Parks and Wildlife Act, zone 1 community conservation areas are managed to:

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

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

The primary purpose of zone 1 community conservation areas is to conserve nature and cultural heritage. In doing so, opportunities are provided for appropriate and sustainable recreation. As required by the Community Conservation Area Agreement, the Central West Community Conservation Area Advisory Committee has been involved in development of this plan of management.

**Part 11 lands** (i.e. unreserved lands) are lands vested in the Minister and include land that is intended to be reserved (e.g. newly acquired additions to the park estate that have not yet been formally reserved); and land that is unlikely to ever be reserved (e.g. severely modified areas, quarries, telecommunication towers, some access roads). Part 11 lands are managed in accordance with the objectives of the National Parks and Wildlife Act, including to:

- conserve nature, including habitats, ecosystems, biodiversity, landforms, landscapes, wilderness and wild rivers
- conserve objects, places or features of cultural value
- foster public appreciation, understanding and enjoyment of natural and cultural heritage and conservation
- apply the principles of ecologically sustainable development.

### **2.3 Specific management directions**

In addition to the general principles for the management of zone 1 community conservation areas (see Section 2.2), the following specific management directions apply to the management of Crawney Pass National Park:

- protect vegetation communities that provide habitat for threatened native animals
- continue involvement in Booroolong frog (*Litoria booroolongensis*) monitoring programs
- continue pest programs in accordance with pest management strategies relevant to the park
- implement the park's fire management strategy.



### 3. Values

This plan aims to conserve both natural and cultural values of Crawney Pass National Park. The location, landforms and plant and animal communities of an area have determined how it has been used and valued by both Aboriginal and non-Aboriginal people. These values may be attached to the landscape as a whole or to individual components, for example, to plant and animal species used by Aboriginal people. To make this plan clear and easy to use, various aspects of natural heritage, cultural heritage, threats and ongoing use are dealt with individually, although these features are interrelated.

#### 3.1 Geology, landscape and hydrology

Crawney Pass lies on the Liverpool Range which is part of the Great Dividing Range. The Liverpool Range runs in a generally east–west alignment forming the northern boundary of the Hunter Region.

Crawney Pass, after which the park is named, is a saddle on the Liverpool Range at 980 metres above sea level. The pass is situated between a peak of 1246 metres above sea level located some 1.5 kilometres to the west of the park, and the highest point in the park, a peak of 1109 metres above sea level, approximately one kilometre east of Crawney Pass. Crawney Pass provides access over the Liverpool Range.

Topography of the park is generally rugged with steep inclines of more than 30 degrees in places.

Nearly all of the park is mapped as Cenozoic basalt (Liverpool Range Beds) and carboniferous sediments. A small occurrence of Devonian-aged Yarrimie Formation (Tamworth Fold Belt) occurs in Crawney Gully near its confluence with Wombramurra Creek (Bell 2009).

The main threat to soils is extreme rainfall events especially following an intense bushfire that removes vegetation cover. Based on the steep terrain and nature of the soils, there is potential for widespread gully erosion in most of the park. While the soils are well-structured, concentrated flows can easily cause the profile to erode like sand (Manser 1968). Disturbance to soil caused by construction works and feral animals can also initiate erosion. Major soil erosion may also lead to reduced water quality in the catchment. The protection of water quality is also important to protect the Booroolong frogs that occur in the park.

The Liverpool Range forms the catchment divide between the Murray–Darling Basin and the coastal river system of the Hunter Valley. North of Crawney Pass the park drains via Wombramurra Creek and Crawney Gully into the Peel River, which flows into the Namoi River as part of the Darling River catchment. South of Crawney Pass the park drains into the Isis River, which flows into the Pages River and then into the Hunter River.

#### Issues

- Roads and trails in the steeper sections of the park have potential to erode and degrade water quality.

#### Desired outcomes

- Soil erosion is minimised.
- Water quality and the health of streams in the park are maintained or improved where possible.

## Management response

- 3.1.1 Ensure trail maintenance and other management activities are carried out in a manner that minimises soil erosion and water pollution.

## 3.2 Native plants

While much of the park's vegetation is in relatively good condition, areas in the north-eastern portion of the park which were formerly private land have been cleared in the past. Furthermore, areas in the north of the park have been disturbed by frequent fire and impacts of grazing are evident on the lower slopes. Disturbance from logging is limited.

Although the park lies within two catchments, the vegetation, mostly grassy open forests and woodlands, is similar on both sides of the range. Bell (2009) recorded 171 native plant species in the park. The most common canopy species include rough-barked apple (*Angophora floribunda*), silvertop stringybark (*Eucalyptus laevopinea*), ribbon gum (*E. viminalis*), forest oak (*Allocasuarina torulosa*) and Bendemeer white gum (*E. elliptica*).

The most common understorey species include a native geranium (*Geranium solanderi*), large tussock grass (*Poa labillardierei*), bidgee-widgee (*Acaena novae-zelandiae*), kidney weed (*Dichondra repens*), tree violet (*Melicactus dentatus*) and sweet pittosporum (*Pittosporum undulatum*) in sheltered areas.

Bell (2009) classified the vegetation in the park into six communities:

- **Pittosporum – Daphandra Rainforest** is restricted to a single catchment on the southern side of the park. This community is found on deep alluvial soils adjacent to relatively major creek lines. It is dominated by sweet pittosporum and *Daphandra* sp.
- **River Oak – Apple Riparian Forest** is found in the lower sections of Crawney Gully on stream channel banks and associated flats. It is dominated by river oak (*Casuarina cunninghamiana*), rough-barked apple and ribbon gum.
- **Forest Oak – Apple Gully Forest** occurs in the southernmost gullies of the park. This community is dominated by rough-barked apple and forest oak. Silvertop stringybark is absent from this community.
- **Forest Oak – Apple Stringybark Forest** is dominant on slopes and ridges of the southern section of the park and on the lower slopes in the north around Crawney Creek. It is dominated by forest oak, rough-barked apple and silvertop stringybark.
- **Bundy – Bendemeer Gum – Apple Forest community** is found at higher elevations on the gentle upper slopes and ridges near Crawney Pass and on northerly extending spur lines. It is dominated by bundy (*E. nortonii*), Bendemeer white gum and forest oak. Nundle cycad (*Macrozamia concinna*) is a common understorey species (see photograph on the front cover).
- **Ribbon Gum – Stringybark Forest** is found at higher elevations east of Crawney Pass. It is dominated by ribbon gum and silvertop stringybark.

While no threatened plant species have been recorded in the park, there are records of three species of conservation significance occurring in the park (see Table 1).

**Table 1: Significant plant species recorded in Crawney Pass National Park**

Common name	Scientific name	Significance
Bendemeer white gum	<i>Eucalyptus elliptica</i>	ROTAP 3KC+
Nundle cycad	<i>Macrozamia concinna</i>	Regionally significant
	<i>Hibbertia pilifera</i>	Newly described species possibly of conservation concern

ROTAP = Rare or Threatened Australian Plant (Briggs & Leigh 1996).

Key:

3 = Range of more than 100km but is in small populations.

K = Poorly known species that is suspected of being at risk.

C = Species is known to occur within a national park or conservation reserve.

+ = Species is recorded in the park, but the population size is unknown.

Bendemeer white gum is at the southern limit of its known range. This species occurs east of Armidale, south to the Liverpool Range, west to Murrurundi, with an outlying population at Mount Kaputar.

Nundle cycad is at the northern extent of its known range. It is found in sloping country in dry sclerophyll woodlands through the Upper Hunter, north to the hills and ranges around the Liverpool Range.

*Hibbertia pilifera* is found within the lower elevations of the park. It is rare and possibly extremely vulnerable (Toelken & Miller 2012) but is not currently listed under the Biodiversity Conservation Act or the Environment Protection and Biodiversity Conservation Act.

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

### Issues

- The park is vulnerable to weed incursions and other edge effects due to its high perimeter-to-area ratio (see Sections 4.1 and 4.4).
- Some of the park's vegetation has been impacted by past land uses, such as grazing and clearing, and by frequent fire.

### Desired outcomes

- Populations of significant plant species are conserved.
- Negative impacts on threatened and significant plant species are minimised.
- Structural diversity and habitat values are restored in previously disturbed areas.

### Management response

- 3.2.1 Monitor natural regeneration and succession of vegetation communities and assist this process if required.
- 3.2.2 Undertake or encourage targeted surveys for threatened plant species and ecological communities that occur or are likely to occur in the park.

### 3.3 Native animals

The park lies within the Great Eastern Ranges Initiative conservation corridor, provides key habitat for priority native animal species (Andren 2004), and is part of a regional corridor providing connectivity westwards along the Liverpool Range to Wallabadah Nature Reserve (Scotts 2003).

Thirteen threatened native animals have been recorded in or within two kilometres of the park (Table 2).

**Table 2: Threatened animals recorded in or within two kilometres of the park**

Common name	Scientific name	NSW status*	National status**
<b>Birds</b>			
Booroolong frog <sup>1</sup>	<i>Litoria booroolongensis</i>	Endangered	Endangered
Black-chinned honeyeater (eastern subspecies)	<i>Melithreptus gulgaris gulgaris</i>	Vulnerable	-
Brown treecreeper <sup>1</sup> (eastern subspecies)	<i>Climacteris picumnus victoriae</i>	Vulnerable	-
Diamond firetail	<i>Stagonopleura guttate</i>	Vulnerable	-
Dusky woodswallow	<i>Artamus cyanopterus cyanopterus</i>	Vulnerable	-
Glossy black-cockatoo <sup>1</sup>	<i>Calyptorhynchus lathami</i>	Vulnerable	-
Little lorikeet	<i>Glossopsitta pusilla</i>	Vulnerable	-
Powerful owl <sup>1</sup>	<i>Ninox strenua</i>	Vulnerable	-
Scarlet robin	<i>Petroica boodang</i>	Vulnerable	-
<b>Mammals</b>			
Eastern false pipistrelle <sup>1</sup>	<i>Falsistrellus tasmaniensis</i>	Vulnerable	-
Greater broad-nosed bat	<i>Scoteanax rueppellii</i>	Vulnerable	-
Greater glider <sup>1</sup>	<i>Petauroides volans</i>	-	Vulnerable
Spotted-tailed quoll	<i>Dasyurus maculatus</i>	Vulnerable	Endangered

\* Status under NSW Biodiversity Conservation Act.

\*\* Status under Commonwealth Environment Protection and Biodiversity Conservation Act.

<sup>1</sup> Species recorded in the park.

The endangered Booroolong frog was known predominantly from west-flowing streams of the Great Dividing Range in New South Wales, from catchments draining the Northern Tablelands to the Tumut River in the Southern Highlands, and other tributaries of the Murrumbidgee River. This medium-sized endangered frog has all but disappeared from the Northern Tablelands and there are few populations recorded in the Namoi and Hunter river catchments. In 2003 it was recorded in the park on an unnamed tributary of the Isis River as part of surveys carried out for the Nandewar component of the NSW Western Regional Assessments (Andren 2004).

More recently, research by local ecologist Phil Spark revealed populations in the Wombramurra Creek area in 2013. However, these surveys failed to detect the Booroolong frog in the park. Any population decline may be due to the disease chytridiomycosis caused by the chytrid fungus (*Batrachochytrium dendrobatidis*) or poor survey conditions. Frog

populations are also preyed on by the red fox (*Vulpes vulpes*). Cooperative surveys for the Booroolong frog should continue.

Maintenance of stream flows is important for the Booroolong frog. It is important to control weeds, such as blackberry (*Rubus fruticosus* agg.) in known habitat and reduce activities that may contribute to stream siltation (Phil Spark, pers. comm., May 2012).

Populations of the large powerful owl are mostly concentrated around the coast, escarpment and tablelands of New South Wales. Lower population densities occur in the drier forests on the NSW western slopes. Common roost trees found in the park include a range of eucalypts, forest oak and rainforest species such as lilly pilly (*Acmena smithii*) and blackwood (*Acacia melanoxylon*). These species are characteristic of the Ribbon Gum – Stringybark Forest community. Threats to owl populations include predation of fledglings by foxes, cats (*Felis catus*) and dogs (*Canis lupus* subsp.), and removal of suitable nesting hollows.

The glossy black-cockatoo was once widespread in south-east Australia. Vegetation clearing, changing fire regimes since European settlement, predation and competition for nest sites have contributed to this species' current patchy distribution. The glossy black-cockatoo lives in woodlands, feeds on she-oaks (*Casuarina* spp. or *Allocasuarina* spp.) and needs eucalypts with hollows for nesting (Carritt 1999). Forest oak and river oak communities are prevalent in the park, providing habitat for this species.

The eastern false pipistrelle is recorded in the park and also in the nearby Timor Caves (Rutledge et al. 2008). Population numbers are declining due to vegetation clearing and the removal of large trees with roosting hollows.

In addition to the threatened species known to occur in or near the park, a number of significant species have been predicted to occur in the park. These include koala (*Phascolarctos cinereus*), yellow-bellied glider (*Petaurus australis*), bush stone-curlew (*Burhinus grallarius*), grey-crowned babbler (eastern subspecies) (*Pomatostomus temporalis temporalis*), squirrel glider (*Petaurus norfolcensis*), eastern horseshoe-bat (*Rhinolophus megaphyllus*) and white-lipped snake (*Drysdalia coronoides*) (Andren 2004).

Strategies for the recovery of threatened animal species and populations have been set out in the *Biodiversity Conservation Program*. 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 also be prepared for threatened species to consider management needs in more detail, and have been prepared for large forest owls, including the powerful owl (DEC 2006), and Booroolong frog (OEH 2012a).

### **Issues**

- Predation by foxes, cats and dogs adversely impacts native animals.
- More information about the Booroolong frog populations, and the reasons for their decline, would assist efforts to protect them.

### **Desired outcomes**

- Habitat and populations of threatened animals known to occur in the park are conserved, protected and maintained.
- Negative impacts on threatened animals are minimised.

### **Management response**

- 3.3.1 Implement relevant strategies in the *Biodiversity Conservation Program* and recovery plans for threatened animals present in the park.
- 3.3.2 Encourage or undertake targeted surveys of Booroolong frog populations in cooperation with relevant authorities.

### **3.4 Aboriginal heritage**

Crawney Pass National Park lies within the traditional Country of the Nungaroo and Wanaruah peoples. The land, water, plants and animals within a landscape are central to Aboriginal spirituality and contribute to Aboriginal identity. Aboriginal communities associate natural resources with the use and enjoyment of foods and medicines, caring for the land, passing on cultural knowledge, kinship systems and strengthening social bonds. Aboriginal heritage and connection to nature are inseparable and need to be managed in an integrated manner across the landscape.

Aboriginal sites are places with evidence of Aboriginal occupation or that are related to other aspects of Aboriginal culture. They are important as evidence of Aboriginal history and as part of the culture of local Aboriginal people. No Aboriginal sites are known from within the park, although there are several within 20 kilometres of the park. It is likely that scattered sources of water and the traversable topography of the park made the area a useful trading route before and after European settlement. It is thought that many Aboriginal camps existed in the vicinity of the park until the 1860s, after which time Aboriginal people were forced to move from camps into missions. Little information about the removal of Aboriginal people from camps in this area has been documented.

While the NSW Government has legal responsibility for the protection of Aboriginal sites and places, NPWS acknowledges the right of Aboriginal people to make decisions about their own heritage. Aboriginal communities will be consulted and involved in managing Aboriginal sites, places and related issues; and in promoting and presenting Aboriginal culture and history. It is important for Aboriginal communities to retain a living connection to the landscape and to the Country they live and work in.

The park is located in the Nungaroo and Wanaruah local Aboriginal land council areas and is part of the Gomeri People Native Title Claim (NC2011/006).

#### **Issues**

- Little is known about Aboriginal use of the park, or its significance to the local people.
- Aboriginal sites and values may be disturbed if not appropriately identified and managed.

#### **Desired outcomes**

- Aboriginal people are involved in managing the Aboriginal cultural values of the park and communities should be supported in their desire to maintain their connection to Country.
- Understanding of the cultural values of the park is improved.
- Impacts on Aboriginal heritage values are minimised.
- Significant Aboriginal places and values are identified and protected.

### **Management response**

- 3.4.1 Continue to consult and involve the Nungaroo and Wanaruah local Aboriginal land councils in the management of Aboriginal sites and places, and cultural and natural values.

- 3.4.2 Encourage further research into the Aboriginal cultural heritage values of the park with the Nungaroo and Wanaruah local Aboriginal land councils.
- 3.4.3 Undertake an archaeological survey and cultural assessment prior to all works with the potential to impact Aboriginal sites or values.

### 3.5 Historic heritage

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, and can include natural resources, objects, customs and traditions. 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.

In 1825 the surveyor and explorer Henry Dangar was dispatched by John Oxley, Surveyor General of New South Wales, to inspect the Liverpool Plains. Dangar traversed Crawney Pass and recommended the district for settlement.

Between 1848 and 1852 Crawney Pass was part of the main thoroughfare linking Maitland and Nundle. Crawney Pass was regarded by many an early settler as an:

... exceptionally steep pass over the mountains [Great Dividing Range] regarded as perilous at the best of times and impassable at worst by the many bullock drivers who bought supplies to the [gold] diggings on a 200-kilometre run from Maitland via Aberdeen and the Isis Valley.

Taken from: Telfer (1980, p. 181)

Other routes across the Liverpool Range were equally challenging. The pass over Hanging Rock was shorter than Crawney Pass but steeper in places. The Peel line, cut by William Telfer Senior, followed Dungowan Creek to Nowendoc across the Barnard River and then to Newcastle via Gloucester, Stroud and Raymond Terrace and was a daunting experience (Telfer 1980). The route via Nundle – Currabubula – Quirindi – Murrurundi and on to Maitland was less demanding but longer than travelling via Crawney Pass.

During the 1890s a weekly mail service ran over Crawney Pass, although it was not until the 1940s that a public road was gazetted (Boileau 2007).

Prior to reservation, the area was grazed by a variety of stock, including donkeys. Several fence lines of potential historic value remain in the park, in particular, one along the spine of the Liverpool Range.

The site of the 1948 crash of an Australian National Airways liner, *Lutana*, into Mount Crawney lies approximately two kilometres west of the park (*The Advertiser* 6 September 1948). Although not within the park, the site is significant in the local area. A memorial containing the propeller from the *Lutana* has been erected near the Nundle town swimming pool, and other wreckage is exhibited in the town's museum.

#### Issues

- Information about the historical use and values of the park is limited.

#### Desired outcomes

- Negative impacts on historic heritage values are minimised.
- Understanding of the cultural values of the park is improved.

## Management response

- 3.5.1 Record historic sites and assess their significance.
- 3.5.2 Undertake an archaeological survey and cultural assessment prior to all works with the potential to impact historic sites and places.

## 3.6 Visitor use

NPWS parks and reserves provide a range of visitor experiences. NPWS aims to ensure that visitors enjoy, experience and appreciate the parks while park values are conserved and protected. Crawney Pass National Park does not attract large numbers of visitors. No visitor facilities are provided, and current use is typically low-impact, self-reliant nature-based recreation such as bushwalking and birdwatching.

Crawney Road, a public road managed by Tamworth Regional and Upper Hunter Shire councils, provides access to the park. This public road, which crosses Crawney Pass, largely follows a road easement through the park (see Figure 1). Heading north from the park, Crawney Road enters the Peel River valley.

Areas managed by other authorities and private operators in the region provide opportunities for a range of recreation activities. Bowling Alley Point Recreational Reserve on Chaffey Dam, north of Nundle, offers picnicking and camping. Closer to the park, camping is available at Teamsters Rest Camping Area which is managed by Tamworth Regional Council. Camping and picnicking facilities are available at Timor Caves Reserve which is managed by Upper Hunter Shire Council. Camping is also available on neighbouring private land. Nearby parks such as Wallabadah and Ben Halls Gap nature reserves do not provide visitor facilities. Towarri National Park, located approximately 40 kilometres south-west of the park offers walking tracks, camping and picnicking.

### Horse riding and the Bicentennial National Trail

The Bicentennial National Trail follows Crawney Road through the park (see Figure 1). The Bicentennial National Trail is a continuous 5330-kilometre route through the Great Dividing Range of eastern Australia, from Cooktown in far north Queensland to Healesville in Victoria. It is available for various forms of non-motorised transport including walking, horse riding and cycling. The section of the Bicentennial National Trail through the park is part of the 'Nundle detour' that extends from Aberdeen to New Country Swamp. It is an alternative to the preferred route, east of the park, that is closed due to private property access issues. Should the preferred route be reopened, use of Crawney Pass is expected to decline.

Horse riding is a popular recreational activity that has cultural associations for many Australians. The *Strategic Directions for Horse Riding in NSW National Parks* (OEH 2012c) provides a framework to improve riding opportunities in eight priority regions in New South Wales, including the Hunter Central Coast Region where the park is located. Recreational horse riding is not permitted in the park except along the Bicentennial National Trail (following a public road bisecting the park) and on Minto Trail (a neighbour access trail). It is not permitted on other trails because there is a lack of suitable connecting trails and because of the latent risks to the park's natural values. Horse riding opportunities are available in other parks in the region including Barrington Tops State Conservation Area and Werakata National Park.

## Issues

- There is some unauthorised access and use of the park (see Section 5.1).
- Due to its size and terrain there are limited opportunities for visitor use of the park.



- The Bicentennial National Trail follows Crawney Road, a public road through the park.

**Desired outcomes**

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

**Management response**

- 3.6.1 Manage the park for low-key uses such as bushwalking, solitude, photography and birdwatching.
- 3.6.2 Continue to liaise with Bicentennial National Trail volunteer groups and the Department of Industry – Lands regarding the use and management of the Bicentennial National Trail.
- 3.6.3 Allow recreational horse riding along Minto Trail.

**3.7 Information and education**

Information provision assists the protection of natural and cultural heritage, promotes support for conservation, and increases the enjoyment and satisfaction of visitors. Regulatory and park identification signage is needed at the park boundary and where Ridge and Minto trails meet Crawney Road to address the incidence of unauthorised vehicle access and illegal activities such as hunting and wood gathering.

Crawney Road intersects with the spine of the Liverpool Range at Crawney Pass, an ideal location for a small interpretive panel describing the view to the south and the ecological significance of the area, including threatened species known from the park and the work being undertaken to monitor and conserve them. It could also educate readers about potential illegal activities such as firewood collecting, motorbike riding and hunting within the park.

**Issues**

- There are limited opportunities for visitors to learn about the park.

**Desired outcomes**

- The community better understands and appreciates the park's natural and cultural values.
- Visitors are aware of the regulatory provisions applicable to the park.

**Management response**

- 3.7.1 Provide information about the park to relevant tourism groups and information centres.
- 3.7.2 Liaise with the relevant councils to provide interpretive, safety and minimal impact use information at Crawney Pass.
- 3.7.3 Install and maintain park identification and regulatory signs at park boundaries and elsewhere as required.

## 4. Threats

### 4.1 Pests

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

The *Biosecurity Act 2015* and its regulations provide specific legal requirements for the response, management and control of biosecurity risks, including weeds and pest animals. These requirements apply equally to public and privately-owned land. Under this framework, Local Land Services (LLS) has prepared regional strategic weed management plans and regional strategic pest animal management plans for each of its 11 regions. The LLS plans identify priority weeds and pest animals in each of the regions, plus the appropriate management response for the region (i.e. prevention/alert, eradication, containment or asset protection). Plans relevant to the park are the Hunter LLS and North West LLS regions' weed management plans (Hunter LLS 2018; North West LLS 2017) and pest animal plans (Hunter LLS 2018; North West LLS 2018).

NPWS prepares regional pest management strategies which identify the operations and control actions undertaken by NPWS to meet the priorities outlined in the LLS regional strategic pest and weed management plans. The NPWS strategies also include other important programs such as the *Biodiversity Conservation Program* (see Sections 3.2 and 3.3). For example, pest species that are also key threatening processes may be managed under the *Biodiversity Conservation Program*. The *Saving our Species* program has developed targeted strategies for managing key threatening processes using the best available information to minimise current and future impacts of key threatening processes on priority biodiversity values, including threatened species and ecological integrity.

The overriding objective of the NPWS regional pest management strategies is to minimise adverse impacts of introduced species on biodiversity and other park and community values, while complying with legislative responsibilities. The NPWS regional pest management strategy for Central Coast Hunter Region (OEH 2012b) identifies pest species and priority programs for the park. The strategy also identifies where other site- or pest-specific plans or strategies need to be developed to provide a more detailed approach. The strategy will be regularly updated. Reactive programs may also be undertaken in cooperation with neighbouring land managers in response to emerging issues. Significant weed and pest animals recorded in the park are listed in Table 3 (see below).

Areas of bushland that are long and narrow are more susceptible to edge effects such as incursions by pest and weed species. The park is approximately four kilometres long and only 300–1000 metres wide. Given the size and shape of the park, and the ridge of the Liverpool Range bisecting the central area of the park, it is more likely to act as a corridor for pest movement rather than harbouring extensive permanent populations.

Private lands north of the park have extensive populations of blackberry and St John's wort (*Hypericum perforatum*). It is important that streams remain open and free of overhanging weeds, including blackberry, to protect Booroolong frog habitat. Streams and gullies in the park should be kept relatively free of blackberry to prevent movement of weeds downstream. This is especially important in those creeks and gullies upstream of healthy Booroolong frog populations. Care is required to ensure that weed control methods do not adversely impact frog habitat, for example by chemical contamination or excessive siltation.

**Table 3: Significant weeds and pest animals recorded in the park**

Common name	Scientific name	Comment
<b>Weeds</b>		
Blackberry <sup>A B D</sup>	<i>Rubus fruticosus</i> agg.	Isolated populations along the northern and southern creek lines and south of Ridge Trail. The land acquired in 2013 and added to the park in 2018 has infestations of blackberry, particularly in the tributaries of Crawney Gully. Blackberries growing along creek lines can impede water flow which may be detrimental to Booroolong frog habitat.
Paterson's curse <sup>B</sup>	<i>Echium plantagineum</i>	Scattered and sporadic populations along Crawney Road, near the head of Crawney Gully.
Bathurst burr	<i>Xanthium spinosum</i>	In disturbed areas, particularly along tracks. Often seasonal.
<b>Pests</b>		
Feral dog <sup>C F G</sup>	<i>Canis lupus</i> (subsp)	Stock losses have occurred around the park. Ridge lines in the park may be used as travelling routes by wild dogs.
European red fox <sup>C E F G</sup>	<i>Vulpes vulpes</i>	Scattered occurrences throughout park.
Feral pig <sup>C E F G</sup>	<i>Sus scrofa</i>	Scattered occurrences throughout park.
Feral deer <sup>C F G</sup> (red and fallow)	<i>Dama dama</i> , <i>Cervus elaphus</i>	Scattered occurrences throughout park.
Goat <sup>C E F G</sup>	<i>Capra hircus</i>	Scattered occurrences throughout park.
Domestic stock	<i>Bos</i> spp.	Some incursions of stray cattle (see Section 5.2).

<sup>A</sup> Declared Weed of National Significance.

<sup>B</sup> Hunter LLS (2017) and North Western LLS (2017) regional priority weed, asset protection management category.

<sup>C</sup> Declared key threatening process under the Biodiversity Conservation Act.

<sup>D</sup> An escaped garden plant under the key threatening process of loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants (NSW SC 2011).

<sup>E</sup> Declared key threatening process under the Environment Protection and Biodiversity Conservation Act.

<sup>F</sup> Hunter LLS (2018) asset protection pest animal management category.

<sup>G</sup> North West LLS (2018) asset protection pest animal management category.

### Desired outcomes

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

## **Management response**

- 4.1.1 Manage pest species in accordance with the NPWS regional pest management strategy and other strategies and plans as relevant.
- 4.1.2 Opportunistically survey the park to determine the presence and abundance of pest species, identify biodiversity most at risk and, if necessary, undertake reactive control programs.
- 4.1.3 Seek the cooperation of neighbours in implementing weed and pest control programs. Undertake control in cooperation with Hunter LLS and North West LLS and other pest and weed authorities.
- 4.1.4 Liaise with neighbouring land managers regarding the treatment of weeds near streams to protect Booroolong frog habitat.
- 4.1.5 Use of horses and working dogs for mustering straying stock may be permitted subject to NPWS Area Manager approval and in accordance with strict conditions.

## **4.2 Fire**

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

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

The park's fire history is only partially known. Fire entered the park in 2006 and 2013, burning parts of the northern area of the park, including parts of the lands gazetted in 2018. Further fire in this area, in particular where these previous fires both burnt, may exceed ecological thresholds which could result in negative environmental impacts.

A fire management strategy which defines the fire management approach for the park has been prepared (DECC 2009) and is updated periodically. The strategy outlines the recent fire history of the park, key assets within and adjoining the park, including sites of natural and cultural heritage value, fire management zones and fire control advantages such as management trails and water supply points. It also contains fire regime guidelines for conservation of the park's vegetation communities.

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

### **Desired outcomes**

- Negative impacts of fire on life, property and the environment are minimised.
- The potential for spread of bushfires on, from or into the park is minimised.

- Fire regimes are appropriate for conservation of native plant and animal communities.

### Management response

- 4.2.1 Implement the fire management strategy for the park and update it as required.
- 4.2.2 Continue involvement with the Liverpool Range and Tamworth bush fire management committees and maintain cooperative arrangements with local RFS brigades and surrounding landowners regarding fuel management and fire suppression.
- 4.2.3 Ensure fire regimes are appropriate for the protection of habitat values, plant species and communities (especially rainforest), and allow for natural succession and regeneration.
- 4.2.4 Rehabilitate any containment lines created for fire suppression in the park.

### 4.3 Climate change

Human-induced climate change has been listed as a key threatening process under the Biodiversity Conservation Act (NSW SC 2000b) and the associated loss of habitat is listed on the Environment Protection and Biodiversity Conservation Act (TSSC 2001). The latest information on projected changes to climate are from the NSW and ACT Regional Climate Modelling (NARClIM) project (OEH 2014). The climate projections for 2020–2039 are described as ‘near future’, and projections for 2060–2079 are described as ‘far future’. The snapshot shown in Table 4 is for the Hunter Region which includes Crawney Pass National Park (OEH 2014).

**Table 4: Hunter 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 1.6–2.6°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 1.5–2.5°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 and winter	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 and spring

Source: OEH 2014.

The projected increases in temperature, number of hot days and severe fire weather days (OEH 2014) are likely to lead to greater intensity and frequency of fires across the Hunter Region (DECCW 2010). Annual rainfall is projected to increase. Overall, a slight increase in runoff is projected, with a substantial increase in summer, a minor increase in autumn, and decreases in winter and spring. These changes are likely to lead to greater intensity and frequency of fires, more severe droughts, reduced river runoff and water availability, regional flooding and increased erosion (DECCW 2010).

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

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

**Desired outcome**

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

**Management response**

- 4.3.1 Continue existing fire, pest and weed management programs to increase the park's ability to cope with future disturbances, including climate change, and encourage research into appropriate indicators to monitor the effects of climate change.

**4.4 Isolation and fragmentation**

Much of the area surrounding the park and adjoining travelling stock reserve has been cleared, which has resulted in a loss of biodiversity and fragmentation of habitat. The park and the adjoining travelling stock reserve are small and isolated and subject to edge effects, making them more vulnerable to disturbances. Differing adjacent land uses place pressures on parks through the incursion of non-native plant and animal species.

Cooperative arrangements with neighbours are important for the management of access, fire, weeds and pest animals. Additionally, long-term conservation of biodiversity depends on the protection, enhancement and connection of remaining habitat across the landscape, incorporating vegetation remnants on both public and private lands. LLS is coordinating a Booroolong frog monitoring program in and around Crawney Pass National Park. It is important for involvement in this program to continue, if possible.

One of Australia's largest conservation corridors is being established through the Great Eastern Ranges Initiative, a program helping people, plants and animals adapt to future environmental threats by maintaining, improving and reconnecting 'islands' of natural vegetation along the ranges of eastern Australia, from western Victoria through New South Wales and the Australian Capital Territory, to far north Queensland. The park is located within this corridor and has potential to link to other conservation areas.

**Desired outcome**

- The negative impacts of isolation and fragmentation are reduced.

**Management response**

- 4.4.1 Maintain cooperative arrangements with nearby landholders regarding access, fire and pest species management.
- 4.4.2 Encourage protection and enhancement of native vegetation, key habitats and corridors on public and private lands in the vicinity of the park.

## 5. Management operations and other uses

### 5.1 Access

Minto Trail provides access to private lands neighbouring the park. The road corridor is vested in the Minister administering the National Parks and Wildlife Act for the purposes of Part 11 of that Act. It was not included in the reserved area of the park because, at the time of reservation, it was the only means of access to the adjoining private property. Not reserving the road ensured the continuation of existing arrangements for accessing the private property. While this 'Ministerial road' does not form part of the park, it is subject to the provisions of this plan and the National Parks and Wildlife Act. Any modification or upgrade of the road would only be permitted under the terms of a formal agreement. Should an alternative access route be established to the private property currently accessed by Minto Trail, then this trail will be reserved as park, designated as a management trail and gated accordingly.

The only other trail in the park is Ridge Trail. It provides access for management purposes such as fire management, pest control and weed suppression.

There are some unauthorised activities on both Minto and Ridge trails. As a Ministerial road, Minto Trail must remain open to public vehicle access. On Ridge Trail, if unauthorised vehicle use leads to negative environmental, social or other impacts, consideration will be given to restricting unauthorised public vehicle access. Access could be restricted via signage, gates and wing fencing, or other methods.

A locked gate has been illegally placed on the Crown road in the travelling stock reserve (TSR) north of the park by the former private property owner adjoining the park and the TSR. The gate blocks access from the TSR to the northern area of the park, restricting pest control and fire suppression activities.

#### Desired outcomes

- Ridge and Minto trails are appropriately maintained.
- Private property access rights continue and have minimal impact on park values.
- Unauthorised access to the park is minimised.

#### Management response

- 5.1.1 Maintain Minto and Ridge trails as shown in Figure 1.
- 5.1.2 Install signage and/or gates and wing fencing on Ridge Trail as required to prevent vehicle use if ongoing unauthorised access results in significant adverse impacts.
- 5.1.3 Consult with North West LLS, the Crown Lands Department and the adjoining neighbour to re-establish access to the northern area of the park from the Crown road through the travelling stock reserve and the adjoining property.
- 5.1.4 Allow animals to be transported within vehicles to private property accessed through the park via Minto Trail. The vehicles must not stop, and the animals must remain in the vehicle within the park.
- 5.1.5 Close any trails not shown in Figure 1 and allow them to revegetate.

## 5.2 Boundary fencing and adjustment

Introduced grazing animals impair the growth and regeneration of native vegetation, accelerate soil erosion, create environments favourable for colonisation by introduced plants and assist their spread. Domestic cattle occasionally stray into the park where boundary fencing is inadequate or non-existent.

A priority for NPWS is to cooperate with neighbours in the construction and maintenance of effective boundary fencing. Although not legally bound by the *Dividing Fences Act 1991*, NPWS may contribute to the cost of boundary fencing with neighbours where resources are available. Fencing assistance, however, is only provided where necessary for the exclusion of livestock from NPWS parks and reserves.

The legal responsibility for preventing cattle from entering the park rests with the stock owner, and NPWS will require owners to remove straying stock from the park.

Crawney Road is a public road that passes through the park and is maintained by Upper Hunter Shire and Tamworth Regional councils. This road follows a road reserve and is generally not within the park. In part, however, the formed alignment of Crawney Road deviates from its road reserve and encroaches into the park. A boundary adjustment of the park under section 188C of the National Parks and Wildlife Act is desirable to adjust the road reserve so that it follows the road's actual alignment.

### Desired outcomes

- Straying stock are prevented from entering the park.
- The park boundary follows the alignment of Crawney Road.

### Management response

- 5.2.1 Consult with neighbours and LLS to develop a fencing strategy to protect the values of the park from straying stock.
- 5.2.2 Seek to adjust the park boundary so that the road reserve for Crawney Road coincides exactly with the formed alignment of the road.



## 6. Implementation

This plan of management establishes a scheme of operations for Crawney Pass National Park.

Identified activities for implementation are listed in Table 5. Relative priorities are allocated to each activity as follows:

- **High priority** activities are imperative to achieve the objectives and desired outcomes of this plan and must be undertaken in the near future to avoid significant deterioration in natural, cultural or management resources.
- **Medium priority** activities are necessary to achieve the objectives and desired outcomes but are not urgent.
- **Low priority** activities are desirable to achieve the objectives and desired outcomes but can wait until resources become available.
- **Ongoing** activities are undertaken on an annual basis, or in response to an issue that arises.

This plan of management does not have a specific term and will stay in force until amended or replaced in accordance with the National Parks and Wildlife Act.

**Table 5: List of management responses**

Plan ref.	Management response	Priority
<b>3.1 Geology, landscape and hydrology</b>		
3.1.1	Ensure trail maintenance and other management activities are carried out in a manner that minimises soil erosion and water pollution.	Ongoing
<b>3.2 Native plants</b>		
3.2.1	Monitor natural regeneration and succession of vegetation communities and assist this process if required.	Low
3.2.2	Undertake or encourage targeted surveys for threatened plant species and ecological communities that occur or are likely to occur in the park.	Low
<b>3.3 Native animals</b>		
3.3.1	Implement relevant strategies in the <i>Biodiversity Conservation Program</i> and recovery plans for threatened animals present in the park.	High
3.3.2	Encourage or undertake targeted surveys of Booroolong frog populations in cooperation with relevant authorities.	Medium
<b>3.4 Aboriginal heritage</b>		
3.4.1	Continue to consult and involve the Nungaroo and Wanaruah local Aboriginal land councils in the management of Aboriginal sites and places, and cultural and natural values.	Ongoing
3.4.2	Encourage further research into the Aboriginal cultural heritage values of the park with the Nungaroo and Wanaruah local Aboriginal land councils.	Ongoing
3.4.3	Undertake an archaeological survey and cultural assessment prior to all works with the potential to impact Aboriginal sites or values.	Ongoing
<b>3.5 Historic heritage</b>		
3.5.1	Record historic sites and assess their significance.	Ongoing

Crawney Pass National Park Draft Plan of Management

<b>Plan ref.</b>	<b>Management response</b>	<b>Priority</b>
3.5.2	Undertake an archaeological survey and cultural assessment prior to all works with the potential to impact historic sites and places.	Ongoing
<b>3.6 Visitor use</b>		
3.6.1	Manage the park for low-key uses such as bushwalking, solitude, photography and birdwatching.	Ongoing
3.6.2	Continue to liaise with Bicentennial National Trail volunteer groups and Department of Industry – Lands regarding the use and management of the Bicentennial National Trail.	High
3.6.3	Allow recreational horse riding along Minto Trail.	
<b>3.7 Information and education</b>		
3.7.1	Provide information about the park to relevant tourism groups and information centres.	Low
3.7.2	Liaise with the relevant councils to provide interpretive, safety and minimal impact use information at Crawney Pass.	Low
3.7.3	Install and maintain park identification and regulatory signs at park boundaries and elsewhere as required.	Low
<b>4.1 Pests</b>		
4.1.1	Manage pest species in accordance with the NPWS regional pest management strategy and other strategies and plans as relevant.	High
4.1.2	Opportunistically survey the park to determine the presence and abundance of pest species, identify biodiversity most at risk and, if necessary, undertake reactive control programs.	Medium
4.1.3	Seek the cooperation of neighbours in implementing weed and pest control programs. Undertake control in cooperation with Hunter LLS and North West LLS and other pest and weed authorities.	High
4.1.4	Liaise with neighbouring land managers regarding the treatment of weeds near streams to protect Booroolong frog habitat.	Medium
4.1.5	Use of horses and working dogs for mustering straying stock may be permitted subject to NPWS Area Manager approval and in accordance with strict conditions.	Ongoing
<b>4.2 Fire</b>		
4.2.1	Implement the fire management strategy for the park and update it as required.	High
4.2.2	Continue involvement with the Liverpool Range and Tamworth bush fire management committees and maintain cooperative arrangements with local RFS brigades and surrounding landowners regarding fuel management and fire suppression.	High
4.2.3	Ensure fire regimes are appropriate for the protection of habitat values, plant species and communities (especially rainforest), and allow for natural succession and regeneration.	High
4.2.4	Rehabilitate any containment lines created for fire suppression in the park.	High
<b>4.3 Climate change</b>		
4.3.1	Continue existing fire, pest and weed management programs to increase the park's ability to cope with future disturbances, including climate change, and	High

<b>Plan ref.</b>	<b>Management response</b>	<b>Priority</b>
	encourage research into appropriate indicators to monitor the effects of climate change.	
<b>4.4 Isolation and fragmentation</b>		
4.4.1	Maintain cooperative arrangements with nearby landholders regarding access, fire and pest species management.	High
4.4.2	Encourage protection and enhancement of native vegetation, key habitats and corridors on public and private lands in the vicinity of the park.	Low
<b>5.1 Access</b>		
5.1.1	Maintain Minto and Ridge trails as shown in Figure 1.	Ongoing
5.1.2	Install signage and/or gates and wing fencing on Ridge Trail as required to prevent vehicle use if ongoing unauthorised access results in significant adverse impacts.	Medium
5.1.3	Consult with North West LLS, the Crown Lands Department and the adjoining neighbour to re-establish access to the northern area of the park from the Crown road through the travelling stock reserve and the adjoining property.	High
5.1.4	Allow animals to be transported within vehicles to private property accessed through the park via Minto Trail. The vehicles must not stop, and the animals must remain in the vehicle within the park.	Ongoing
5.1.5	Close any trails not shown in Figure 1 and allow them to revegetate.	Medium
<b>5.2 Boundary fencing and adjustment</b>		
5.2.1	Consult with neighbours and Local Land Services to develop a fencing strategy to protect the values of the park from straying stock.	Medium
5.2.2	Seek to adjust the park boundary so that the road reserve for Crawney Road coincides exactly with the formed alignment of the road.	Low

## References

- Andren MJ 2004, *Nandewar Biodiversity Surrogates: Vertebrate fauna*, report for the Resource and Conservation Assessment Council (RACAC), NSW Western Regional Assessments, coordinated by Department of Infrastructure Planning and Natural Resources, Project NAND05, Department of Environment and Conservation, Coffs Harbour.
- Bell S 2009, *Vegetation and floristics of Murrurundi Pass and Crawney Pass National Parks, Hunter Valley, New South Wales, East Coast Flora Survey, Kotara Fair.*
- Briggs JD & Leigh JH 1996, *Rare or Threatened Australian Plants*, CSIRO Publishing, Collingwood, Victoria.
- Boileau J 2007, *Thematic History of Nundle, Manilla and Barraba Tamworth Regional Council Community Based Heritage Study*, Joanna Boileau, Condong, NSW.
- Carritt R 1999, *Glossy Black-Cockatoo*, Conservation Management Note 2, NSW National Parks and Wildlife Service for Conservation Partners Program, Hurstville.
- DEC 2006, *NSW Recovery Plan for the Large Forest Owls: Powerful Owl (*Ninox strenua*), Sooty Owl (*Tyto tenebricosa*) and Masked Owl (*Tyto novaehollandiae*)*, Department of Environment and Conservation NSW, Sydney.
- DECC 2007, *Introducing the NSW Threatened Species Priorities Action Statement (PAS)*, Department of Environment and Climate Change, Sydney, NSW, [www.environment.nsw.gov.au/resources/threatenedspecies/threatspecpas07168.pdf](http://www.environment.nsw.gov.au/resources/threatenedspecies/threatspecpas07168.pdf).
- DECC 2009, *Crawney Pass National Park & Wallabadah Nature Reserve Fire Management Strategy (Type 2) 2009*, National Parks and Wildlife Service, Hunter Region, Department of Environment and Climate Change (NSW), [www.environment.nsw.gov.au/firemanagement/CrawneyPassWallabadah.htm](http://www.environment.nsw.gov.au/firemanagement/CrawneyPassWallabadah.htm).
- DECCW 2010, *NSW Climate Impact Profile: The impacts of climate change on the biophysical environment of New South Wales*. Department of Environment, Climate Change and Water NSW, Sydney, [www.climatechange.environment.nsw.gov.au/Impacts-of-climate-change/2010-NSW-climate-impact-reporting](http://www.climatechange.environment.nsw.gov.au/Impacts-of-climate-change/2010-NSW-climate-impact-reporting).
- Hunter LLS 2017, *Hunter Regional Strategic Weed Management Plan 2017–2022*, Hunter Local Land Services, [https://hunter.lls.nsw.gov.au/\\_data/assets/pdf\\_file/0004/722875/Hunter\\_Regional\\_Strategic\\_weed\\_management\\_plan\\_web-1.pdf](https://hunter.lls.nsw.gov.au/_data/assets/pdf_file/0004/722875/Hunter_Regional_Strategic_weed_management_plan_web-1.pdf).
- Hunter LLS 2018, *Hunter Regional Strategic Pest Animal Management Plan 2018–2023*, Hunter Local Land Services, [https://www.lls.nsw.gov.au/\\_data/assets/pdf\\_file/0004/820795/Hunter-Pest-Plan.pdf](https://www.lls.nsw.gov.au/_data/assets/pdf_file/0004/820795/Hunter-Pest-Plan.pdf).
- Manser W 1968, *Geological Map of New England, 1:100 000 Series*, Wingen, University of New England Press.
- NSW SC 2000a, *Final Determination to List High Frequency Fire Resulting in the Disruption of Life Cycle Processes in Plants and Animals and Loss of Vegetation Structure and Composition as a Key Threatening Process on Schedule 3 of the TSC Act*, New South Wales Scientific Committee, [www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=20014](http://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=20014).

- NSW SC 2000b, *Final Determination to List Anthropogenic Climate Change as a Key Threatening Process on Schedule 3 of the TSC Act*, New South Wales Scientific Committee, [www.environment.nsw.gov.au/threatenedspecies/HumanClimateChangeKTPListing.htm](http://www.environment.nsw.gov.au/threatenedspecies/HumanClimateChangeKTPListing.htm).
- NSW SC 2011, *Final Determination to list loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants as a Key Threatening Process on Schedule 3 of the TSC Act*, New South Wales Scientific Committee, <https://www.environment.nsw.gov.au/determinations/escapedgardenplantsFD.htm>
- NSW DPI and OEH 2011, *Biodiversity Priorities for Widespread Weeds*, report prepared for the 13 Catchment Management Authorities (CMAs) by NSW Department of Primary Industry and Office of Environment & Heritage, Orange.
- North West LLS 2017, *North West Regional Strategic Weed Management Plan 2017–2022*, North West Local Land Services, [https://northwest.lls.nsw.gov.au/\\_data/assets/pdf\\_file/0010/722917/North-West-Regional-Weed-Mgmt-Plan-web-version.pdf](https://northwest.lls.nsw.gov.au/_data/assets/pdf_file/0010/722917/North-West-Regional-Weed-Mgmt-Plan-web-version.pdf).
- North West LLS 2018, *North West Regional Strategic Pest Animal Management Plan 2018–2023*, North West Local Land Services, [https://www.lls.nsw.gov.au/\\_data/assets/pdf\\_file/0007/820807/North-West-Pest-Plan.pdf](https://www.lls.nsw.gov.au/_data/assets/pdf_file/0007/820807/North-West-Pest-Plan.pdf).
- OEH 2012a, *National Recovery Plan for Booroolong Frog (Litoria booroolongensis)*, Office of Environment and Heritage, Sydney, [www.environment.gov.au/system/files/resources/bb38ec60-bdea-43db-8fbd-4b28a0af6fca/files/litoria-booroolongensis.pdf](http://www.environment.gov.au/system/files/resources/bb38ec60-bdea-43db-8fbd-4b28a0af6fca/files/litoria-booroolongensis.pdf).
- OEH 2012b, *Regional Pest Management Strategy 2012–17, Central Coast Hunter Region: A new approach for reducing impacts on native species and park neighbours*, Office of Environment and Heritage, Sydney, [www.environment.nsw.gov.au/pestsweeds/RegionPestManagement.htm](http://www.environment.nsw.gov.au/pestsweeds/RegionPestManagement.htm).
- OEH 2012c, *Strategic Directions for Horse Riding in NSW National Parks*, Office of Environment and Heritage, Sydney, [www.environment.nsw.gov.au/resources/protectedareas/120848HRStrat.pdf](http://www.environment.nsw.gov.au/resources/protectedareas/120848HRStrat.pdf).
- OEH 2013a, *Living with Fire in NSW National Parks; A strategy for managing bushfires in national parks and reserves 2012–2021*, Revised edition, Office of Environment and Heritage, Sydney, NSW, [www.environment.nsw.gov.au/resources/firemanagement/120690LiveFire.pdf](http://www.environment.nsw.gov.au/resources/firemanagement/120690LiveFire.pdf).
- OEH 2013b, *Saving our Species*, Office of Environment and Heritage, Sydney, [www.environment.nsw.gov.au/savingourspecies/about.htm](http://www.environment.nsw.gov.au/savingourspecies/about.htm).
- OEH 2014, *Hunter: Climate change snapshot*, Office of Environment and Heritage, Sydney, [www.climatechange.environment.nsw.gov.au/Climate-projections-for-NSW/Climate-projections-for-your-region/Hunter-Climate-Change-Downloads](http://www.climatechange.environment.nsw.gov.au/Climate-projections-for-NSW/Climate-projections-for-your-region/Hunter-Climate-Change-Downloads).
- OEH 2017, *Biodiversity Conservation Program*, Office of Environment and Heritage, [www.environment.nsw.gov.au/threatenedspecies/pas.htm](http://www.environment.nsw.gov.au/threatenedspecies/pas.htm).
- Rutledge J, Smith G, Brainwood J & Baker A 2008, *Timor Caves Hunter Valley New South Wales*, Newcastle and Hunter Valley Speleological Society, Broadmeadow.
- Scotts D 2003, *Key Habitats and Corridors for Forest Fauna: A landscape framework for conservation in north-east New South Wales*, Occasional Paper 32, NSW National Parks and Wildlife Service, Hurstville.

Telfer W 1980, *The Wallabadah Manuscript Recollections of the Early Days*, New South Wales University Press, Sydney.

Thackway R & Cresswell I 1995, *An Interim Biogeographic Regionalisation for Australia: A framework for establishing the national system of reserves*, Version 4.0, Australian Nature Conservation Agency, Canberra.

*The Advertiser* 1948, *Lutana Was Lost In Storm*, September 6 edition, p. 1, Adelaide SA: 1931–1954, viewed 8 February 2016 from <http://nla.gov.au/nla.news-article43781837>.

Toelken HR & Miller RT 2012, Notes on *Hibbertia* (Dilleniaceae) 8. Seven new species, a new combination and four new subspecies from subgen. *Hemistemma*, mainly from the central coast of New South Wales, *J. Adelaide Bot. Gard.* vol. 25, pp. 71–96, [https://data.environment.sa.gov.au/Content/Publications/JABG25P071\\_Toelken.pdf](https://data.environment.sa.gov.au/Content/Publications/JABG25P071_Toelken.pdf).

TSSC 2001, *Commonwealth Listing Advice on Loss of Terrestrial Climatic Habitat Caused by Anthropogenic Emissions of Greenhouse Gases*, Threatened Species Scientific Committee, [www.environment.gov.au/cgi-bin/sprat/public/publicshowkeythreat.pl?id=7](http://www.environment.gov.au/cgi-bin/sprat/public/publicshowkeythreat.pl?id=7).