

BANGADILLY NATIONAL PARK
PLAN OF MANAGEMENT

NSW National Parks and Wildlife Service

Part of the Department of Environment, Climate Change and Water

November 2009

This plan of management was adopted by the Minister for Climate Change and the Environment on 1st November 2009.

Acknowledgements

The National Parks and Wildlife Service acknowledges that these parks are located within the traditional country of the Gundungurra people.

This plan of management is based on a draft plan prepared by staff of the South Coast Region of the National Parks and Wildlife Service.

Valuable information and comments were provided by Department specialists, the South Coast Region Advisory Committee and other community members.

Cover photograph: View from Mt Penang by Chris Keyzer, NPWS.

For additional information or enquiries on any aspect of the plan or this park, contact the NPWS Highlands Area Office on (02) 4887 8244.

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FOREWORD

Bangadilly National Park is located approximately 20 kilometres west of the town of Bowral in the NSW Southern Highlands. It was established in 2001 and consists of three separate, similarly sized land parcels with a total area of 2,141 hectares.

Bangadilly National Park consists of plateau and ridge country bordered by steep escarpments that drop to the Wingecarribee River valley. It covers a major biophysical boundary between two bio-regions/botanical subdivisions. To the east is the Sydney Basin Bio-Region, while to the west is the South Eastern Highlands Bio-Region. Bangadilly National Park is of regional significance for its protection of poorly preserved vegetation communities, rare plants and threatened fauna populations.

The park is in a relatively remote location and currently has no visitor facilities.

The New South Wales *National Parks and Wildlife Act 1974* requires that a plan of management be prepared for each national park. A draft plan of management for Bangadilly National Park was placed on public exhibition from 19th October 2007 until 11th February 2008. The submissions received were carefully considered before adopting this plan.

This plan contains a number of actions to achieve “Better environmental outcomes for native vegetation, biodiversity, land, rivers, and coastal waterways” (Priority E4 in the State Plan) including weed and pest animal control, regeneration of cleared and disturbed areas, and protection of stands of significant plant species. The plan also contains a number of actions to help achieve Priority E8 in the State Plan “More people using parks, sporting and recreational facilities, and participating in the arts and cultural activity”, including upgrading and signposting of a loop trail to Mount Penang and opportunities for self-reliant walking and dispersed walk-in camping.

This plan of management establishes the scheme of operations for Bangadilly National Park. In accordance with section 73B of the *National Parks and Wildlife Act 1974*, this plan of management is hereby adopted.



John Robertson MLC
Minister for Climate Change and the Environment

1. MANAGEMENT CONTEXT

1.1 LEGISLATIVE AND POLICY FRAMEWORK

The management of national parks in NSW is in the context of a legislative and policy framework, primarily the *National Parks and Wildlife Act 1974* (NPW Act), the NPW Regulation, the *Threatened Species Conservation Act 1995* (TSC Act) and the policies of the National Parks and Wildlife Service (NPWS). The matters to be considered in the preparation of a plan of management are listed in Section 72AA of the NPW Act. NPWS policies relate to nature conservation, cultural heritage conservation, recreation, commercial use, research and information provision.

Other legislation, agreements and charters may also apply to management of the area. In particular, the *Environmental Planning and Assessment Act 1979* (EPA Act) requires the assessment and mitigation of the environmental impacts of any works proposed in this plan.

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

Regional Forest Agreements

Bangadilly National Park is covered by the Southern Regional Forest Agreement. Regional Forest Agreements (RFA) are one of the principle means of implementing the National Forest Policy Statement of 1992. Under this Statement Commonwealth, State and Territory governments agreed to work towards a shared vision for Australia's forests. Joint comprehensive regional assessments (CRA) were undertaken of the natural, cultural, economic and social values of forests and these assessments formed the basis for negotiation of RFA providing for, amongst other things, ecologically sustainable forest management.

1.2 MANAGEMENT PURPOSES AND PRINCIPLES

National parks are reserved 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 the Act, national parks 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 reuse) of any buildings or structures or modified natural areas having regard to conservation of natural and cultural values; and
- provide for appropriate research and monitoring.

2. BANGADILLY NATIONAL PARK

Bangadilly National Park is located approximately 20 kilometres west of the town of Bowral in the NSW Southern Highlands (see locality map below). It lies within the Wingecarribee Shire Local Government Area.

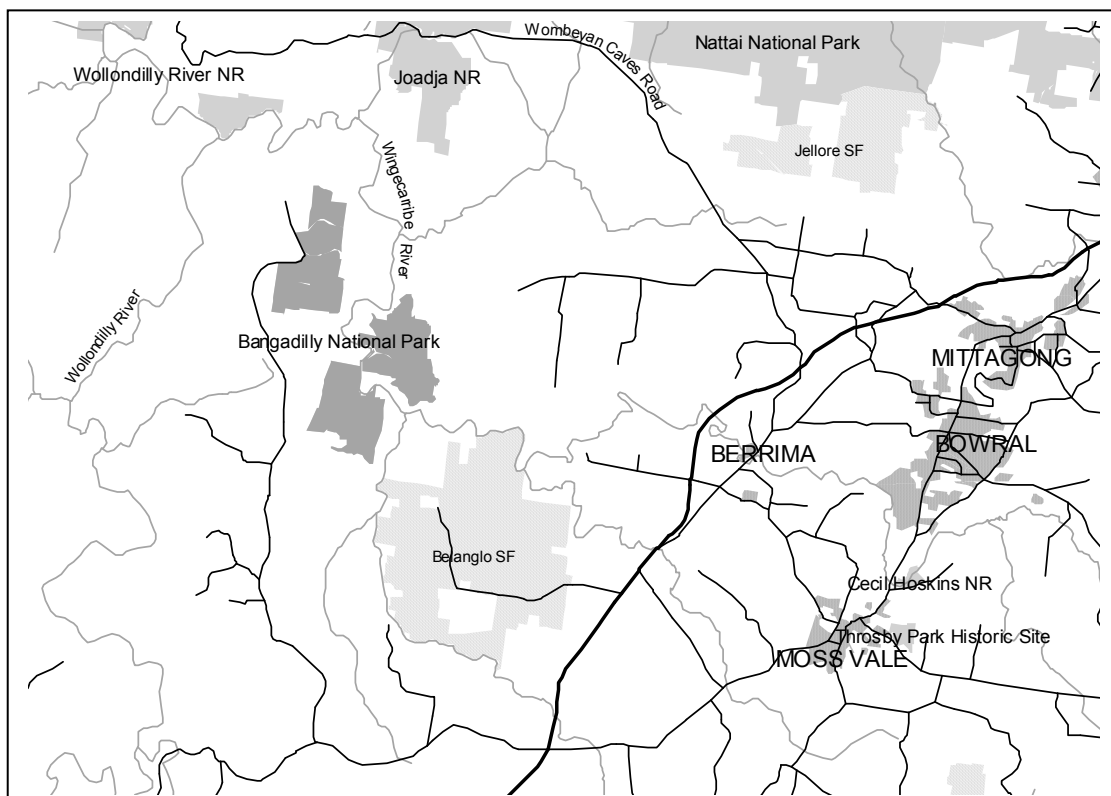
The park was reserved in January 2001 as a result of the Southern Regional Forest Agreement. It covers an area of 2,141 hectares and consists of three separate, similarly-sized land parcels. The parcels will be referred to in this plan as the north, south and east sections.

Prior to reservation the north and east sections were vacant crown land and the south section was Bangadilly State Forest. The park is named after the former state forest.

The park is bounded primarily by freehold properties, which are used for a variety of grazing and agricultural purposes. The exception is east Bangadilly, which has crown land on its eastern boundary (see park map, centre pages). Joadja and Wollondilly River Nature Reserves are approximately 4 kilometres to the north and Belanglo State Forest is less than a kilometre to the south.

The park will be managed primarily to protect its significant vegetation communities and its rare and threatened plant and animal species. Past grazing, logging and uncontrolled recreational access have resulted in formation of tracks and clearings and loss of large trees from some areas and these impacts need to be addressed.

The park is in a relatively remote location and currently has no visitor facilities. It is suited to providing low key and self-reliant recreation opportunities for scenery viewing, walking and backpack camping.



Locality Map

3. VALUES OF THE PARK

The location, landforms and plant and animal communities of an area determine how it is used and valued. Both Aboriginal and non-Aboriginal people place values on natural areas, including aesthetic, social, spiritual, recreational and economic values. These values may be attached to the landscape as a whole or to individual components, for example plant and animal species used by Aboriginal people. This plan of management aims to conserve both natural and cultural values and recognises the inter-relationships between them.

Bangadilly National Park protects a sample of the natural and cultural heritage of the northern part of the Southern Tablelands. It is of regional significance for its protection of poorly preserved vegetation communities, rare plants and threatened fauna populations.

3.1 Landform, Geology and Soils

The landform of the north, south and east sections of Bangadilly shows similar characteristics. Each section has an area of plateau and ridge country bounded by steep escarpments and rocky gullies that drop into valleys along the Wingecarribee River or its tributaries. Much of the escarpment includes cliffs. The valleys are generally freehold land but the park includes some valley floor, particularly in the south section adjacent to the Wingecarribee River. The park's altitude varies from 510 metres near the river to 795 metres above sea level at Mount Penang.

Mount Penang and Joadja Hill, as well as other rocky outcrops on the ends of the ridges, provide spectacular views of the park and the Wingecarribee River valley.

There are several watercourses in the park. Most drain directly into the Wingecarribee River while the rest drain to the river via other creeks. The watercourses are dry most of the time as the average annual rainfall of the reserve is only about 850mm. Wingecarribee River drains to the Wollondilly and Nepean Rivers. The park contributes to water quality in these rivers and Lake Burragorang, which supplies water for the Sydney metropolitan region. The Wingecarribee River also carries water from the Shoalhaven River when it is being transferred to augment Sydney's water supply.

The plateau areas of the north and east sections lie on Triassic Hawkesbury Sandstone while the slightly lower south section is on softer Permian age Illawarra Coal Measures. Below the Illawarra Coal Measures, the escarpments reveal Berry Formation sandstone and siltstone outcrops. The valley floor is underlain by much older Devonian rocks of granite and porphyry. There is a small area of Tertiary basalt on Mount Penang.

The park is close to the western edge of the Sydney Basin and the Hawkesbury Sandstone outcrop in the Mount Penang area is a westerly outlier.

Soils on the plateau and slopes are generally shallow and sandy while the valley floors have deeper, more fertile soils, including alluvium. The soils are highly erodible on slopes and when exposed.

3.2 Native Vegetation

Open forest and woodland occur on the dry ridges and slopes of the park while there are tall forests in the sheltered valleys and along the river. The vegetation in the majority of the park is largely undisturbed but there has been extensive logging in the south section, a small amount of timber cutting in the north section and some clearing for grazing on lower slopes and valley floor areas in all three sections.

The park covers a major biophysical boundary, between two bio-regions/botanical subdivisions. To the east is the Sydney Basin Bio-Region on Triassic and Permian sedimentary rocks, while to the west is the South Eastern Highlands Bio-Region which is dominated by older rocks of Devonian age. The park's vegetation shows a blend of two distinct flora types - "Sydney Basin flora" and "Tablelands flora" (Kevin Mills & Associates, 2002).

Forests and woodlands on the plateaus are dominated by "Sydney Basin species", particularly grey gum (*Eucalyptus punctata*), silver-top ash (*E. sieberi*), hard-leaved scribbly gum (*E. sclerophylla*) and blue-leaved stringybark (*E. agglomerata*). The slopes and valleys support the "tablelands species" yellow box (*E. melliodora*), red stringybark (*E. macrorhyncha*), Argyle apple (*E. cinerea*), brittle gum (*E. mannifera*) and apple box (*E. bridgesiana*), with river peppermint (*E. elata*) and manna gum (*E. viminalis*) on deeper soils and river oak (*Casuarina cunninghamiana*) along the river. Some of the Sydney Basin species are likely to be at or close to their south-western limit of distribution in the park (Kevin Mills & Associates, 2002).

Nine vegetation communities have been identified (Kevin Mills & Associates, 2002) as set out below.

Community	Key species	Understorey	Occurrence
Grey Gum-Stringybark Forest	<i>E. punctata</i> <i>E. agglomerata</i>	Open shrubby understorey	Plateau and dry slopes
Silvertop Ash-Stringybark Forest	<i>E. sieberi</i> <i>E. agglomerata</i>	Open shrubby	Exposed rocky ridges
Scribbly Gum – Brittle Gum Woodland	<i>E. sclerophylla</i> <i>E. mannifera</i>		Deep sand on plateau in south section
Scribbly Gum-Stringybark Forest/Woodland	<i>E. sclerophylla</i> <i>E. agglomerata</i> <i>Allocasuarina littoralis</i>		Deep soils on plateau in east section
Brittle Gum Open Woodland	<i>E. mannifera</i>	Heathland-sedgeland	Poorly drained flats on plateau on south section
Tablelands Forest/Woodland	<i>E. macrorhyncha</i> <i>E. mannifera</i> <i>E. melliodora</i> <i>E. cinerea</i>		Lower slopes
River Peppermint Tall Forest	<i>E. elata</i> <i>E. smithi</i>		Deeper valleys and moist slopes
Manna Gum Tall Forest	<i>E. viminalis</i> <i>E. elata</i>		Deep alluvial soils on river flats
River-oak Tall Forest	<i>C. cunninghamiana</i> <i>E. elata</i> <i>E. viminalis</i>	<i>Lomandra longifolia</i> and wetland plants.	Along the Wingecarribee River

The Comprehensive Regional Assessment (CRA) conducted for the Southern Forest Agreement identified the park as making a significant contribution to the conservation of the North-eastern Tablelands Gully Fern Forest ecosystem. This corresponds to the River Peppermint Tall Forest community in the table above.

Stands of yellow box (*E. melliodora*) - apple box (*E. bridgesiana*) in the Tablelands Forest/Woodland fall within the ambit of the threatened White Box – Yellow Box – Blakely's Red Gum Woodland community. This combination of species is listed as an Endangered Ecological Community under the Threatened Species Conservation Act. Occurrences in the park are on the lower slopes and flats. Past agricultural practices have resulted in most of the community being cleared in the district and some former stands in the park may also have been cleared.

Manna Gum Tall Forest and mature grey gum forests are not well represented in conservation reserves in the region. Stands of grey gum, manna gum, river peppermint

and yellow box are particularly important for fauna conservation in the park as they provide habitat for threatened fauna species.

The following rare or threatened Australian plants (ROTAP) and regionally important species occur in the park.

Species	Habit	Occurrence in park
ROTAP species		
<i>Acacia subtilinervis</i>	Shrub	On rock outcrops in two locations, in the east and south sections
<i>Eucalyptus apiculata</i>	Mallee	One location; on a sandstone outcrop in the east section
<i>Persoonia mollis</i> var. <i>revoluta</i>	Shrub	Deep sandy soils in south west corner of the south section
<i>Pseuderanthus divaricatissimus</i>	Shrub	Mount Penang
Regionally important species		
<i>Asterolasia asterisophora</i>	Shrub	Head of gully in east section of park
<i>Eucalyptus ligustrina</i>	Mallee	A dry slope in east section of park
<i>Notelaea neglecta</i>	Shrub	Near Wingecarribee River

The eastern occurrence of *Acacia subtilinervis* is adjacent to a vehicle track on the park boundary while *Eucalyptus apiculata* occurs adjacent to the Joadja Hill Trail. Both these populations could be at risk from any upgrading or other work carried out along the trails.

Pseuderanthus divaricatissimus is found on the edge of the summit of Mount Penang and could potentially be affected by grazing feral animals and by walkers seeking to enjoy the view.

Kevin Mills & Associates (2002) also identifies a further nine species of conservation interest occurring in the park that are uncommon in the region, have a restricted distribution and/or have been extensively cleared. These are *Acacia stricta*, *Boronia algida*, *Dodonaea multijuga*, *Eucalyptus bridgesiana*, *E. stellulata*, *E. tereticornis*, *Hibbertia circumdens*, *Pomaderris velutina* and *Pultenaea procumbens*.

3.3 Native Animals

The park's varied environments provide quality habitats for a range of native animal species. A survey by Kevin Mills and Associates in autumn 2002 recorded 28 mammal, 86 bird, 14 reptile and 4 frog species in and around the park. It is likely that further species would be recorded in the warmer spring and summer months. The park supports substantial arboreal mammal populations, particularly of the greater glider (*Petauroides volans*).

The fauna survey recorded nine threatened native animal species listed as vulnerable under the Threatened Species Conservation Act. A more recent survey has confirmed that koalas are present in the east and south sections of the park and a local landowner has reported sighting koalas in the east section on several occasions (J. Fuller pers. comm.). The CRA modelled the park as providing significant habitat for the spotted-tailed quoll and for several other threatened species that may occur. Of these, the hooded robin and the regent honeyeater have been recorded near the park.

Threatened fauna recorded in the park	Threatened fauna that may occur
Powerful owl (<i>Ninox strenua</i>)	Regent honeyeater (<i>Xanthomyza phrygia</i>)
Glossy black-cockatoo (<i>Calyptrorhynchus lathami</i>)	Turquoise parrot (<i>Neophema pulchella</i>)
Speckled warbler (<i>Chthonicola sagittata</i>)	Smoky mouse (<i>Pseudomys fumeus</i>)
Spotted-tailed quoll (<i>Dasyurus maculatus</i>)	Masked owl (<i>Tyto novaehollandiae</i>)
Yellow-bellied glider (<i>Petaurus australis</i>)	Swift parrot (<i>Lathamus discolor</i>)
Large bentwing-bat (<i>Miniopterus schreibersii</i>)	Hooded robin (<i>Myzomela sanguinolenta</i>)
Large-eared pied bat (<i>Chalinolobus dwyeri</i>)	
Greater broad-nosed bat (<i>Scoteanax rueppelii</i>)	
Eastern falsistrelle (<i>Falsistrellus tasmaniensis</i>)	
Koala (<i>Phascolarctos cinereus</i>)	

The lower Wingecarribee River is one of the most important rivers in Australia for platypus (*Ornithorhynchus anatinus*). Individuals can often be seen early morning or late evening foraging for food in the larger pools adjacent to the park. A less common inhabitant, the indigenous water rat (*Hydromys chrysogaster*), has also been recorded foraging (Dr T. Grant pers. comm.).

Peregrine falcons (*Falco peregrinus*) have been observed in the park and probably breed on the cliffs. This is an uncommon species that is under pressure from human activities in much of its range.

Emus would have formerly occurred naturally in the area. Emus now occur in the north and south sections of the park, and these populations may be original inhabitants or a result of escapes or releases. It is appropriate to retain the current populations since emus have been lost from most parts of eastern NSW.

The park is part of a major habitat corridor stretching between Morton National Park and Nattai and Blue Mountains National Parks that incorporates NPWS and Crown lands, state forest and private property. The properties between the three park sections and to the south of the park are declared wildlife refuges.

3.4 Aboriginal Heritage

The park lies within the territory of the Gundungurra Aboriginal people, whose traditional land extends from Lithgow to Goulburn. Other groups with associations to the area are the Daruk to the north, Dharawal to the east and Wiradjuri to the west. The Wingecarribee River valley, with its permanent water source and diverse plant and animal resources, is likely to have been significant as a living area and travel route. The junction of the Wingecarribee and Wollondilly Rivers, downstream from the park, is known to be significant in Aboriginal mythology.

Today the park is within the area of the Illawarra Local Aboriginal Land Council, the Wodi Wodi Elders and the Gundungurra Tribal Council.

The park is covered by the draft Gundungurra Non-native Title Indigenous Land Use Agreement (ILUA), which incorporates a large area of the central tablelands. The draft ILUA provides for Aboriginal input to park management.

There has been little survey for Aboriginal sites in the park but two sites are known - an axe grinding groove and a rock shelter with art. It is probable that other sites exist, the most likely being rock shelters with art or occupation deposit along the cliff lines, camp sites on the river and artefact scatters on the ridgelines.

3.5 Historic Heritage

Timber cutting has probably taken place in the area since the early 20th century and the north and south sections of the park were managed throughout the 1960's and 70's for the collection of firewood, fencing posts and mining timbers (Forestry Commission, NSW).

An old truck and a timber and earth rolling ramp are located adjacent to the Spring Ridge Trail, in the north section of the park. The truck appears to have been converted to support timber cutting and milling. Its wheels and engine have been removed.

In the south section (formerly Bangadilly State Forest) there are a number of large tree stumps carrying the "pegging" or "boarding" scars of earlier timber getting operations. This technique was used by axemen to cut trees down above the butt section of the trunk. It enabled easy rolling of the tree in a straight line once fallen, without being encumbered by the uneven size of the butt. Using a board created a spring effect which was considerably easier on the body than working from hard ground (B. Boyd pers. comm.).

Mount Penang, in the north section of the park, has an old stone trigonometric station at the summit.

The remains of a one-room hut are located adjacent to a creek south of Joadja Hill, near the Wingecarribee River. The remains consist of sandstone block footings and the base of a chimney. The hut is thought to have been built by early squatter settlers, possibly around the 1830s. It is reported that a stick fence was formerly located across the gully to serve as a cattle corral and that the cattle were let out to graze on the river flats (J. Fuller pers. comm.).

Clearings along the Wingecarribee River in the south section indicate that grazing was formerly undertaken there.

3.6 Educational and Recreational Values

The park is relatively small and remote from major population centres. It provides opportunities for low key recreational and educational activities such as bushwalking, bird watching, scenery viewing and dispersed walk-in camping. The park is expected to appeal mainly to residents of the surrounding region rather than tourists.

Mount Penang Trig site in the north section commands scenic views over the park and surrounding farmlands in all directions.

The river flats along the Wingecarribee River in the south section provide a tranquil self-reliant bushwalking destination.

Access to the north and south sections of the park is via Tugalong and Mount Penang Roads.

There is no public vehicle access to the east section and it has limited recreational appeal. There are good views from the western ends of the management trails, however and walkers may be able to visit the area by arrangement with neighbours.

4. EXISTING CONDITION AND THREATS

The park is in good condition overall, although parts have been disturbed by clearing, logging and trail formation. A significant amount of trail creation by motorcycle and to a lesser extent horse riding, has occurred in the north and south sections. Other impacts include weeds, introduced animals, some encroachment of stock and illegal firewood collection.

The three different sections of the park are relatively small, isolated and subject to edge effects, making them more vulnerable to disturbances. Protective management is essential if the park's vegetation and fauna habitat values are to be viable in the long term.

As all three sections are largely surrounded by private land, cooperative management arrangements with neighbours will be important for access and the management of fire, weeds and pest animals.

Introduced Species

The park contains approximately 40 species of weeds including three noxious species; blackberry (*Rubus sp.*), serrated tussock (*Nassella trichotoma*) and Patersons curse (*Echium plantagineum*). Under the *Noxious Weeds Act 1993*, noxious weeds must be controlled to the extent necessary to prevent them from spreading to adjoining land. Other weeds of concern found in the park include moth vine (*Araujia hortorum*), fennel (*Foeniculum vulgare*) and winter cherry (*Solanum pseudocapsicum*). The weeds occur predominantly in cleared areas along the Wingecarribee River and are in low numbers in the park. There are significant occurrences of the three noxious weeds on adjacent lands.

Eight introduced animal species have been identified in the park; the fox (*Vulpes vulpes*), wild dog (*Canis lupus*), feral cat (*Felis catus*), feral goat (*Capra hircus*), feral pig (*Sus scrofa*), rabbit (*Oryctolagus cuniculus*), rusa deer (*Cervus timorensis*) and common blackbird (*Turdus mecula*). Goats are common in the park and on neighbouring land while foxes, cats and dogs are probably in low to moderate numbers. Rabbits are in low numbers and occur mainly in the cleared areas. Domestic cattle also occasionally stray into some areas of the park.

Fire

Only limited information is available about the history of fire within the park. In 1979 a wildfire, ignited to the south west of the park by lightning strikes, burned the whole north section. It was contained further to the northeast near Wombeyan Caves Road and to the south at a powerline easement below Mount Penang (G. Barnett pers. comm.). A hazard reduction burn was initiated in 1987 by the Forestry Commission (now Forests NSW) off Tugalong Road, along the eastern side of Mount Penang Road. It was of limited success due to the sparseness of ground fuels and thinning of trees through firewood collection licences (G. North pers. comm.). A hazard reduction burn was carried out by Rural Fire Service brigades and NPWS along the ridge tops of the east section in 2001 shortly after gazettal of the park.

5. MANAGEMENT ISSUES AND STRATEGIES

Current Situation	Desired Outcomes	Strategies	Priority
<p>5.1 Soil and water conservation</p> <p>Most of the park has sandy or gravelly soils that are vulnerable to erosion even on fairly gentle slopes. The good vegetation cover in most locations limits erosion.</p> <p>Some erosion is evident on the Wingecarribee River banks. This is a natural process but has accelerated where trees and other plants have been removed during past clearing beside the Wingecarribee River Trail. Options to move the trail further from the river bank are limited because of the steep slopes.</p> <p>Trail networks have been formed in the south-western corners of both the north and south sections as a result of trail bike and horse riding and there are also a number of overgrown trails in the south section resulting from past timber harvesting. While horse riding is currently minimal, trail bike riding appears to be increasing (see section 5.7 visitor use). Erosion is occurring on trails located on slopes.</p> <p>Water quality is generally good since most of the watercourses begin within the park. Trails in the park contribute to sedimentation of stream habitats, however, which could affect frogs, platypus and other fauna, and reduce downstream water quality in Lake Burragorang. Trails also affect wildlife and feral animal movement and have other detrimental impacts. The trails formed by unauthorised recreational use are mostly narrow and short, have no management function and should be closed to reduce environmental impacts.</p>	<p>Erosion is minimised and is remedied where needed.</p> <p>Water quality and park stream habitats are maintained and protected.</p>	<p>5.1.1. Undertake all works in a manner that minimises erosion, sedimentation and water pollution.</p> <p>5.1.2. Avoid disturbance to bank vegetation along the Wingecarribee River. Reform the Wingecarribee River Trail where it abuts the river bank, to define an eastern edge of the road slightly further from the bank.</p> <p>5.1.3. Close and rehabilitate unauthorised trails. Where needed, block access, erect signs and undertake revegetation.</p>	<p>As required</p> <p>Medium</p> <p>High</p>
<p>5.2 Scenery protection</p> <p>The park features spectacular sandstone cliffs, rock outcrops and steep forested gullies and valleys. Panoramic views of these features are available from high points and from along the Wingecarribee River.</p>	<p>The outstanding scenery and natural features of the park are protected.</p>	<p>5.2.1. Avoid facility installation or activities that impair scenic views and the natural skyline of the park.</p>	<p>As required</p>

Current Situation	Desired Outcomes	Strategies	Priority
<p>5.3 Native plant and animal conservation</p> <p>There is a reasonably good understanding of the park's vegetation and fauna. Further survey is needed, however, to check for additional species that may occur, in particular terrestrial orchids and threatened species such as the regent honeyeater and hooded robin.</p> <p>Several areas in the lower parts of the park have been cleared and some cleared areas on the boundaries of the park continue to be grazed. The lower slopes and valley floors contain significant vegetation communities. In particular, the endangered ecological community White Box–Yellow Box–Blakely's Red Gum Woodland occurs on the valley floors near the Wingecarribee River. Some of the cleared areas of the park may formerly have contained this community and it would be desirable for these areas to return to native forest. Control of weeds and rabbits will be important for regeneration (see below).</p> <p>Areas of river peppermint tall open forest, manna gum and mature grey gum are significant for their limited representation in conservation reserves and their fauna habitat value. Disturbances to these communities should be avoided where possible.</p> <p>The ROTAP species <i>Acacia subtilinervis</i> occurs adjacent to a vehicle track on the northwestern boundary of the east section while <i>Eucalyptus apiculata</i> occurs adjacent to the Joadja Hill Trail. Both occurrences could be at risk from road upgrading, maintenance or fire management work carried out along the trails.</p> <p>The ROTAP plant <i>Pseuderanthus divaricatissimus</i> occurs on the summit of Mount Penang, which is accessed by walkers and horse riders and grazed by goats. Goat control and recreational access are covered below.</p> <p>The primary requirement for maintenance of populations of the threatened fauna found in the park is protection of the vegetation communities they rely on, particularly the tall forests and hollow trees. Under the Threatened Species Conservation Act, strategies for promoting the recovery of most threatened species and endangered ecological communities have been set out in a state-wide Species Priorities Action Statement. These provide primarily for survey, monitoring and management of threats.</p>	<p>Native plant and animal species and communities are conserved.</p> <p>Disturbed areas of the endangered yellow box community are restored.</p> <p>Neighbours and other authorities participate in conservation of significant species across boundaries.</p>	<p>5.3.1 Undertake surveys for significant plant and animal species likely to occur in the park, particularly terrestrial orchids and the regent honeyeater and hooded robin.</p> <p>5.3.2 Work with neighbours to establish or re-align boundary fences where necessary and feasible, in order to exclude grazing from cleared areas of the park and promote regeneration of native forest.</p> <p>5.3.3. Avoid any further disturbance of areas of yellow box. As far as possible, avoid disturbance of areas of river peppermint tall open forest, manna gum and mature grey gum.</p> <p>5.3.4. Mark the stand of <i>Eucalyptus apiculata</i> on the Joadja Hill Trail and avoid disturbance of the stand during trail maintenance work.</p> <p>5.3.5. Liaise with relevant neighbours, Transgrid and the Department of Lands regarding protection of <i>Acacia subtilinervis</i> during road work. Notify Wingecarribee Council of the presence of this species for recording on the significant tree register.</p> <p>5.3.6. Implement priority measures included in the Species Priorities Action Statement and any recovery plans prepared for threatened species and endangered ecological communities occurring in the park.</p>	<p>Medium</p> <p>High</p> <p>Ongoing</p> <p>High</p> <p>High</p> <p>As required</p>

<p>Most of the park is surrounded by private land. Much has been cleared but remaining naturally vegetated areas contribute to maintenance of native plant and animal populations in the area and the habitat corridor between Nattai and Morton National Parks.</p> <p>The east section lies adjacent to a relatively large area of forested Crown land and this significantly improves its biodiversity and habitat values.</p> <p>The Sydney Catchment Authority (SCA) releases water down the Wingecarribee River from Tallowa Dam via the Wingecarribee Reservoir when needed to supplement Sydney's water supply. The SCA's Water Management licence sets transfer conditions that aim to minimise any detrimental effects upon the river system, however population increase and more frequent drought as a result of climate change could result in an increased need for transfers. It is not known whether sustained and frequent high flows in the river could have long-term effects on aquatic plants, invertebrate productivity, bank stability and platypus populations. To help secure Sydney's water supply the NSW Government has approved changes to the operational arrangements at Tallowa Dam that, if implemented, could result in increased transfer of water from the Shoalhaven River to Sydney. If increases in water transfers are required beyond past levels, the government will consider pipeline/tunnel options rather than options that would greatly increase river transfers.</p> <p>Maintaining riverine vegetation on nearby private land and avoiding water pollution are also important for platypus protection.</p> <p>Emus utilising the park also move through private property and their continued presence depends on them being permitted to do so undisturbed.</p>	<p>5.3.7 Encourage conservation of remnant native vegetation around the park through establishment of voluntary conservation agreements or similar mechanisms on adjacent private lands, particularly in areas between the three park sections and connecting the park to nearby reserves and state forest. Also encourage retention or reinstatement of vegetation along the Wingecarribee River on nearby lands.</p> <p>5.3.8 Seek addition to the park of suitable Crown land to the east of the east section.</p> <p>5.3.9 Liaise with the Sydney Catchment Authority to encourage monitoring of the impacts of sustained and frequent high flow transfers on the Wingecarribee River environment if such flows are to continue into the future. Through interagency consultation processes, participate in the identification of environmental flow releases from the Wingecarribee Reservoir if bypass pipelines / tunnels are constructed to deliver future transfers.</p> <p>5.3.10 Liaise with neighbours to encourage wildlife conservation.</p>	<p>Medium</p> <p>Medium</p> <p>As required</p> <p>As required</p>
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Current Situation	Desired Outcomes	Strategies	Priority
<p>5.4 Cultural heritage</p> <p>Little is known about past Aboriginal association with the area. Two Aboriginal sites are known to occur but it is probable that there are others.</p> <p>A native title claim was previously lodged by the Gundungurra Tribal Council over a large area including the park but was subsequently withdrawn. NPWS is working with other agencies and the claimants in preparation of a non native-title Indigenous Land Use Agreement (ILUA). This is likely to include provisions for consultation with relevant Aboriginal people.</p> <p>Features of historic interest in the park are a converted truck and associated ramp, tree stumps with pegging scars, a trigonometry station and hut footings. The hut and truck are in a dilapidated condition. The features are unlikely to be historically significant but need to be formally assessed.</p>	<p>Cultural features are conserved and managed in accordance with their significance.</p> <p>Aboriginal people have input to management of Aboriginal cultural heritage.</p>	<p>5.4.1 Manage Aboriginal sites in conjunction with the Illawarra Local Aboriginal Land Council, the Gundungurra Tribal Council and other relevant Aboriginal community organisations, and in accordance with the Gundungurra ILUA when finalised.</p> <p>5.4.2 Precede all ground disturbance work by a check for cultural features.</p> <p>5.4.3 Record the historic features and assess their significance. Prepare management strategies if needed. Consult and involve local stakeholders.</p>	<p>As required</p> <p>As required</p> <p>Medium</p>
<p>5.5 Introduced species</p> <p>Small infestations of three noxious weeds and a number of environmental weeds occur in the park. Control of some species such as serrated tussock will only be successful if carried out with neighbours.</p> <p>Vertebrate pests of concern in the park are feral goats, rusa deer, feral dogs, foxes and feral cats. Control of these species will be ineffective unless done over a wider area in conjunction with neighbours.</p> <p>Sand pad monitoring is conducted every year to assess the distribution and abundance of foxes and other feral animals. Fox and dog baiting programs are conducted twice per year in conjunction with the Cumberland Livestock Health and Pest Authority (LHPA). Feral cats are not targeted but some control is likely to be achieved through these programs.</p> <p>Goat sightings are recorded and opportunistic ground-based goat shooting is undertaken. An aerial control program has been undertaken in conjunction with the LHPA but further work is needed.</p>	<p>The impact of introduced species on native species and neighbouring lands is minimised.</p>	<p>5.5.1 Monitor and control noxious weeds and treat environmental weeds where they pose a significant threat to conservation values.</p> <p>5.5.2 Continue existing monitoring and control programs for foxes, goats and dogs. Implement control programs for deer if required.</p> <p>5.5.3 Seek the cooperation of other authorities and neighbours in implementing weed and pest animal control programs.</p> <p>5.5.4 Consider fencing the park boundary along Mount Penang Road to prevent straying of stock and other inappropriate activities.</p>	<p>Medium</p> <p>High</p> <p>As required</p> <p>High</p>

<p>Boundary fences are generally in good condition, although in some areas they are absent or not located on the park boundaries (see Native Plant and Animal Conservation). Stock are able to enter the park when driven along Mount Penang Road and fencing may be needed.</p>		5.5.5 Work with neighbours to ensure that boundary fencing is maintained in good condition.	As required
<p>5.6 Fire management</p> <p>Fire is a natural feature of the environment of the park and is essential to the survival of some plant communities. Frequent or regular fire, however, can cause loss of particular plant and animal species and communities. Fire can also damage cultural features and fences and threaten neighbouring lands and assets.</p> <p>It would appear that fire has occurred infrequently in the park and this low fire frequency is likely to have been generally suitable for conservation of plant and animal populations.</p> <p>Ongoing conservation of threatened fauna species requires retention of large trees with hollows and a fire management regime that maintains the existing range of habitats and feed trees including yellow box, mature stands of black she-oak and grey gum, and a mixed understorey of open areas and shrub thickets.</p> <p>Peregrine falcons are very sensitive to disturbances during the breeding season and could be affected by fire and fire management activities.</p> <p>Fire is most likely to enter the park from the west, during hot westerly winds. It could be expected to burn quickly though the park because of the steep slopes. Extensive fires could affect property on adjacent lands and suppression activities would need to be focussed on the rural interface. The Wingecarribee River is the major source of water in the park for fire suppression.</p> <p>A fire management strategy has been prepared for the park that details property and natural and cultural resource protection strategies. A Strategic Fire Advantage Zone has been designated along Tugalong Road in the north section. The remainder of the park has been designated a Heritage Management Zone in which priority is given to the protection of natural and cultural heritage as well as protection of life and property.</p>	<p>Bushfire mitigation measures contribute to the cooperative protection of persons and property on or immediately adjacent to the park.</p> <p>Fire regimes are appropriate for conservation of plant and animal communities.</p> <p>Cultural features are afforded protection from damage by bushfires and fire suppression activities.</p>	<p>5.6.1 Use prescribed fire to achieve a variety of fire regimes in appropriate vegetation types and to maintain habitat suitable for species with specific requirements as described in the fire management strategy.</p> <p>5.6.2 Avoid use of heavy machinery for fire suppression in areas of rare plants and cultural sites.</p> <p>5.6.3 As far as possible, prevent fire from entering known falcon nesting areas during the breeding season.</p> <p>5.6.4 Rehabilitate areas disturbed by fire suppression operations as soon as practical after a fire.</p> <p>5.6.5 Research the fire requirements of the park's vegetation communities and significant species.</p> <p>5.6.6 Continue to participate in the Wingecarribee District Bush Fire Management Committee. Maintain coordination and cooperation with Rural Fire Service brigades and park neighbours with regard to fuel management and fire suppression.</p> <p>5.6.7 Implement the fire management strategy.</p>	<p>As required</p> <p>As required</p> <p>As required</p> <p>As required</p> <p>As required</p> <p>Low</p> <p>Ongoing</p> <p>High</p>

Current Situation	Desired Outcomes	Strategies	Priority
<p>5.7 Visitor use</p> <p>Public access is available to the north and south sections of the park via Tugalong and Mount Penang Roads but there is no public vehicle access to the east section. There are currently no visitor facilities in the park apart from trails.</p> <p>The three sections are quite small and contain populations of threatened and regionally significant vegetation and fauna. The park is remote from population centres and much of it is rugged and difficult to access. Use levels are low although subdivision occurring in the Canyonleigh area may increase the number of visitors. The park is best suited to providing opportunities for low-key visitor uses such as scenery viewing, bushwalking and limited camping.</p> <p>Mount Penang in the north section provides panoramic views of the park and is used as an informal lookout point. A 4WD vehicle trail leads to within 150m of the rocky summit and a walking track has developed the rest of the way. The summit has no fencing and could present a safety risk to visitors but it would not be feasible to fence the area because of its extent. Because of safety concerns, the condition of the trail, and in order to improve opportunities for walking and nature appreciation, vehicle access will be stopped at the park boundary. Visitors will need to walk approximately 1.5 km to reach the summit but the route is reasonably level, apart from the short climb to the summit at the end. A steeper parallel vehicle track through different vegetation communities provides an opportunity to signpost an alternative return walk. Provision of parking adjacent to Tugalong Road rather than part way along the trail will enhance security for visitors' cars.</p> <p>The south section, while small, provides opportunities for self-reliant walking to the Wingecarribee River and has an informal camping area beside the Wingecarribee River Trail. As the country is fairly open there is no need to provide formal walking tracks. A round walk of about 6km could be undertaken utilising in part the Bangadilly Trail and Wingecarribee River Trail (see map). Walking access is not available along the Wingecarribee River Trail through private property, unless by arrangement with neighbours.</p>	<p>Visitor use is ecologically sustainable and appropriate to the values of each section of the park.</p> <p>The community is aware of the conservation significance of the park and of management restrictions and programs.</p>	<p>5.7.1 Prohibit public vehicle use within the park, including trail bike riding.</p> <p>5.7.2 Focus visitor use of the north section on bushwalking and scenery viewing at Mount Penang. Provide a small car park off Tugalong Road adjacent to the Mount Penang Trig Trail. Provide information about the walk to Mount Penang, including the presence of cliffs.</p> <p>5.7.3 Install steps on the walking track to the Mount Penang summit and define a route across the summit where needed that avoids stands of <i>Pseuderanthus divaricatissimus</i>.</p> <p>5.7.4 Install a picnic table and information about the park's values and visitor opportunities at the Tugalong Road car park if warranted by the number of visitors. Provide a toilet if needed.</p> <p>5.7.5 Allow dispersed walk-in camping more than 250m from roads and the Mount Penang Trig Trail. Promote minimal impact use practices. Limit camp fires to gas and liquid fuel fires only.</p> <p>5.7.6 Provide a small car park off Mount Penang Road, adjacent to Bangadilly Trail. Provide information about minimal impact walking and camping practices and indicate possible routes and distances to the Wingecarribee River. If necessary because of increased use levels or to address environmental impacts or other issues, install markers on one or both routes.</p>	<p>Ongoing</p> <p>High</p> <p>Medium</p> <p>Low</p> <p>Low</p> <p>Low</p>

<p>Mount Penang Road, while a public road, is in poor condition. It is not signposted and currently has an unlocked gate at its southern end, making it difficult for visitors to find their way to the south section.</p> <p>Groups of school children from an adjacent outdoor education facility undertake occasional overnight walks, camping in the south section of the park. This is an appropriate activity as long as numbers remain moderate and minimal impact camping is practiced.</p> <p>As discussed in section 5.1, a small amount of horse riding is undertaken on park trails, primarily on the Mount Penang Trig Trail in the north section. Apart from this trail, the publicly accessible trails do not provide significant horse riding opportunities since they are either short informal trails or end in plateau woodland with no views (Bangadilly Trail and Spring Ridge Trail). The sandy erodible soils, the steep escarpments, the need to promote regeneration of the significant valley floor vegetation and the lack of a destination point make riding in the south section of the park inappropriate. The Mount Penang Trig Trail is, however, sufficiently wide to avoid conflicts with walkers and leads to an interesting feature. Riding onto the summit of Mount Penang is not appropriate due to the steepness of the track to the summit and the need to protect rare plants. Riding on the parallel walking trail would not be appropriate because of its steep grade and the desirability of providing a horse-free route for walkers. Spring Ridge Trail leads to private property but is likely to become a public road (see below) and will therefore be available for horse riding.</p> <p>Trail bike riding occurs in the north and south sections and, as discussed in 5.1, has formed networks of narrow trails which should be closed. Off-road riding causes habitat fragmentation and erosion and is not an acceptable activity in a conservation reserve. Trail bike riding on the vehicle trails is not appropriate in Bangadilly because of damage to trail surfaces, danger to walkers and the high likelihood that riders would not confine their activities to the trails. In addition, the vehicle trails are relatively short, do not form loops and therefore do not provide attractive riding opportunities.</p> <p>Some abseiling and rock climbing occurs in the park and this is generally acceptable if conducted in an environmentally sustainable manner. Heavy use or use of fragile areas could result in crumbling of rock formations, vegetation trampling and impacts on fauna such as nesting peregrine falcons. Rock climbing and abseiling are not considered appropriate on Mount Penang since the area is a focus for use by other visitors.</p>	<p>5.7.7 Liaise with Wingecarribee Shire Council about road maintenance on Mount Penang Road and installation of signposting on the Tugalong/Mount Penang Road intersection to guide visitors to the proposed car park. Investigate the status and need for the gate at the southern end of Mount Penang Road.</p> <p>5.7.8 Permit organised group recreational or educational visits, subject to limits on numbers and other conditions if necessary to minimise impacts.</p> <p>5.7.9 Prohibit horse riding in the south and east sections of the park. Allow riding in the north section on the Spring Ridge and Mount Penang Trig Trails only, not on walking tracks or the Mount Penang summit. Limit group sizes to 10 horses and require riders to keep to a walking pace. Provide a hitching rail at the end of the Mount Penang Trig trail, where it meets the walking track to the summit. Keep the impacts of horse riding under review and close the north section to riding if horse riders do not keep to the designated trails or if there are unacceptable impacts.</p> <p>5.7.10 Permit cycling on management trails only.</p> <p>5.7.11 Permit abseiling and rock climbing in the park except at Mount Penang. Groups must be no larger than 12 participants and activities must be conducted in a safe and environmentally acceptable manner. The impacts of rock climbing will be monitored and it may be further regulated if needed, in conjunction with user groups.</p>	<p>Medium</p> <p>As required</p> <p>As required</p> <p>Ongoing</p> <p>Ongoing</p>
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<p>Consideration was given to whether hang gliding was an appropriate activity in the park given the extensive escarpments. It was decided that hang gliding would be environmentally unacceptable because of the significant clearing that would be required to establish a launching area and access.</p>		<p>5.7.12 Prohibit hang gliding in the park.</p> <p>5.7.13 Monitor visitor use levels and impacts and take action where necessary to ameliorate impacts.</p>	<p>Ongoing</p> <p>Ongoing</p>
<p>5.8 Research and monitoring</p> <p>Scientific study is important for improving understanding of the park's natural and cultural heritage and how these values can be best managed and conserved. Priority research topics relate to Aboriginal and historic heritage, threatened plant and animal distribution and fire ecology.</p> <p>Under the Southern RFA all forest managers must demonstrate ecologically sustainable forest management (ESFM). ESFM is a management principle that is applied to all ecosystem types, not just forests. Monitoring is conducted in the park as part of regional measurement of ESFM performance indicators, to provide feedback on management programs and directions for future adaptive management.</p> <p>Assessing and reporting on the condition and management adequacy of reserves is undertaken through the State of Parks (SOP) Program. This utilises a number of indicators related to the condition of natural and cultural heritage and visitor facilities, information availability and the management of threats such as fire and pests.</p>	<p>Research enhances the management information base and has minimal environmental impact.</p> <p>Monitoring shows a high level of success in managing the park on an ecologically sustainable basis.</p>	<p>5.8.1 Undertake and encourage research as needed to improve knowledge and management of the park's natural and cultural heritage</p> <p>5.8.2 Encourage neighbours and bushwalkers to document the area's fauna, particularly rare species.</p> <p>5.8.3 Use the principles of Ecologically Sustainable Forest Management to guide management operations.</p> <p>5.8.4 Undertake ESFM and SOP monitoring in accordance with regional and state-wide programs.</p>	<p>Low</p> <p>Medium</p> <p>Ongoing</p> <p>Medium</p>

Current Situation	Desired Outcomes	Strategies	Priority
<p>5.9 Private property access and Crown road reserves</p> <p>Two trails through the park (Spring Ridge and Wingecarribee River) are vested in the Minister for the Environment under Part 11 of the NPW Act and are not currently part of the park. They were vested by the <i>National Parks Estate (Southern Region Reservations) Act 2000</i> (NPE Act) to ensure that private property access arrangements which existed immediately before the park's creation could continue. The Act provides that these roads must ultimately be either added to or excluded from the park.</p> <p>Liaison with neighbours indicates that Spring Ridge Trail provides essential private property access but Wingecarribee River Trail does not. Spring Ridge Trail runs parallel to a Crown road reserve and it would be desirable to re-define the road reserve along the actual road alignment.</p> <p>Other Crown road reserves are located within the north and east sections of the park. These are not needed and should be added to the park.</p>	<p>Private property access continues to be provided where appropriate.</p> <p>Management is simplified through inclusion of redundant Crown roads in the park.</p>	<p>5.9.1 Seek addition to the park of Wingecarribee River Trail. Enter into agreements with neighbours for continued access and future maintenance of Spring Ridge Trail. Seek realignment of the adjacent road reserve to lie along the trail.</p> <p>5.9.2 Seek to have the other Crown road reserves added to the park.</p>	<p>High</p> <p>Low</p>
<p>5.10 Management Operations</p> <p>Management trails are needed in the park to provide access for purposes such as weed and pest control, and visitor and fire management. The main existing trails form a satisfactory system. As stated above, narrow and overgrown trails will be closed.</p> <p>Access for management purposes to the east section is through private property, via an arrangement with local landowners. Management access to the Wingecarribee River Trail and between the east and south sections is along roads located partly on Crown road reserves and partly on private property. It would be desirable to formalise access arrangements.</p> <p>Two power lines touch the boundaries of the north section of the park. One of these runs parallel to Tugalong Road while the other is below Mount Penang. A Telstra line runs along Spring Ridge Trail to adjacent private property.</p>	<p>Management facilities adequately serve management needs and have acceptable impact.</p> <p>Utility infrastructure has minimal impact on park values.</p>	<p>5.10.1 Maintain the NPWS management trails shown on the map (centre pages).</p> <p>5.10.2 Seek formal arrangements for management access to the east section, to the Wingecarribee River Trail, and between the east and south sections.</p> <p>5.10.3 Liaise with Telstra and electricity authorities as needed regarding maintenance of the telephone and powerline routes in a manner that minimises environmental impacts.</p> <p>5.10.4 Should access no longer be available through neighbouring private properties, management access will be reviewed.</p>	<p>Low</p> <p>Medium</p> <p>As required</p> <p>As required</p>

LEGEND FOR PRIORITIES

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

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

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

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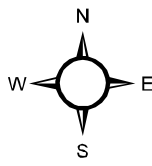
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Bangadilly National Park

- - - - - Management trail

— Road

..... Walking track

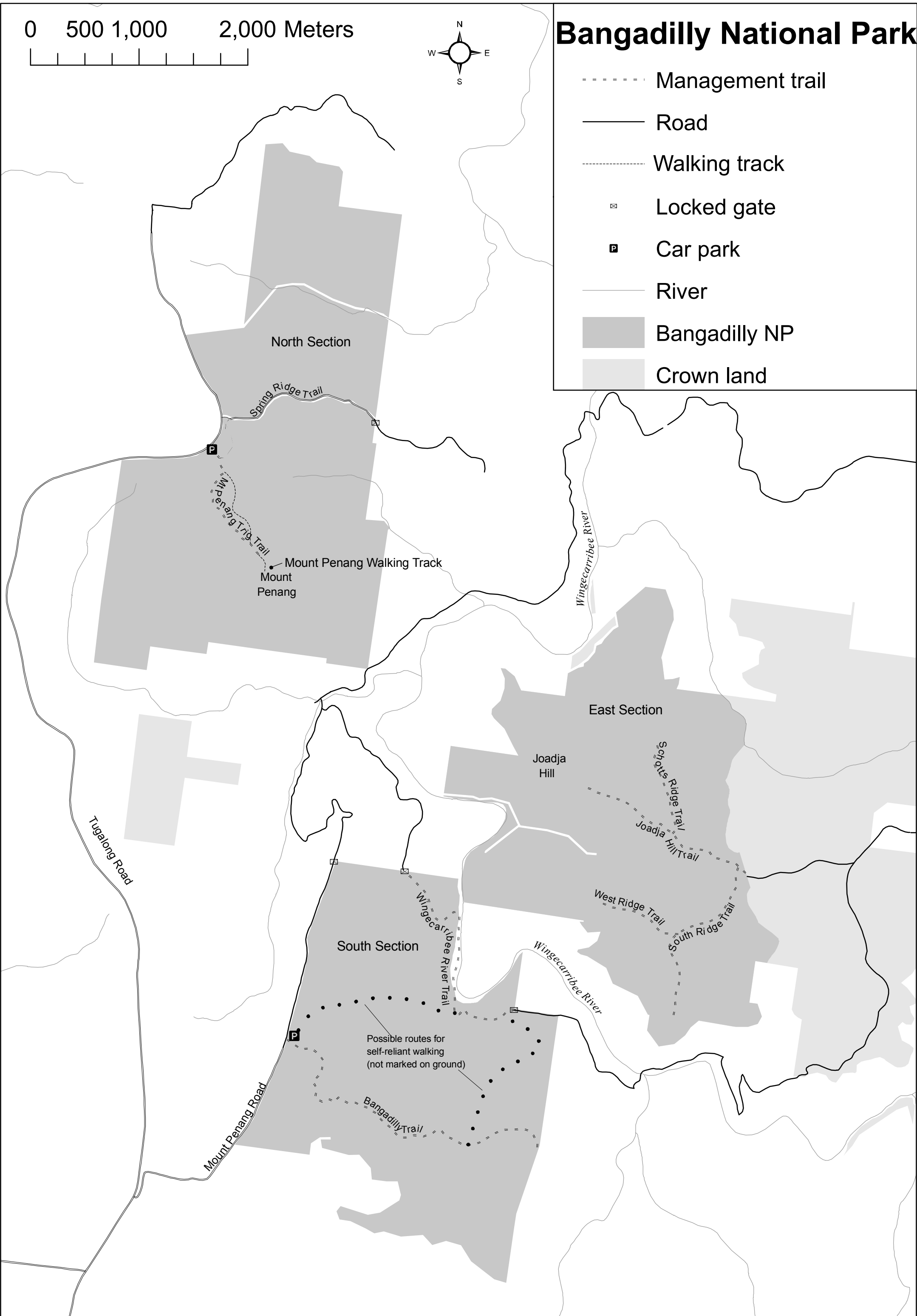
⊠ Locked gate

P Car park

— River

■ Bangadilly NP

■ Crown land



North Section

Spring Ridge Trail

Mount Penang Trig Trail

Mount Penang Walking Track
Mount Penang

Wingecarribee River

East Section

Joadja Hill

Schotts Ridge Trail

Joadja Hill Trail

West Ridge Trail

South Ridge Trail

South Section

Wingecarribee River Trail

Wingecarribee River

Possible routes for self-reliant walking (not marked on ground)

Bangadilly Trail

Tugalong Road

Mount Penang Road