



# Plan of Management

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# Willi Willi National Park



**WILLI WILLI NATIONAL PARK  
PLAN OF MANAGEMENT**

**NSW National Parks and Wildlife Service**

**September 2011**

**This plan of management was adopted by the Minister for the Environment on 22<sup>nd</sup> September 2011.**

### **Acknowledgments**

The NSW National Parks and Wildlife Service (NPWS) acknowledges that Willi Willi National Park is in the traditional country of the Dunghutti Aboriginal people.

This plan of management is based on a draft plan prepared by staff of the Mid North Coast Region of the NPWS, part of the Office of Environment and Heritage, Department of Premier and Cabinet.

FRONT COVER: Banda Banda Arboretum by Alex Wyatt, NPWS. Waterfall Wilson River, and Strangler Fig Wilson River, by Harry Creamer, NPWS.

For additional information or any inquiries about this park or this plan of management, contact the NPWS Macleay Area Office at Cardwell Street, South West Rocks NSW 2431 or by telephone on (02) 6566 6621.

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## FOREWORD

Willi Willi National Park covers an area of 30,030 hectares on the eastern fall of the Great Dividing Range, approximately 50 kilometres west of Kempsey on the Mid North Coast of New South Wales.

Willi Willi National Park conserves a wide diversity of wet forest vegetation including rainforest, one of the most significant stands of Antarctic beech forest in Australia, and many threatened plant and animal species. A large proportion of the park, 23 309 hectares, is declared as the Willi Willi Wilderness.

Willi Willi National Park contains places of cultural significance to the Dunghutti Aboriginal people. It also contains evidence of past forestry activities, including the Banda Banda arboretum. The boundaries of the park include the former Banda Banda Flora Reserve which is part of the Gondwana Rainforests of Australia World Heritage Area.

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 Willi Willi National Park was placed on public exhibition from 28 November 2008 until 9 March 2009. The submissions received were carefully considered before adopting this plan.

The plan contains a number of actions to achieve the State Plan priority to “Protect native vegetation, biodiversity, land, rivers and coastal waterways”, including a vegetation survey and a program to monitor the status of the significant plant communities and threatened plant species, development of a management plan for Banda Banda arboretum, and weed and pest animal control strategies. The plan also contains a number of actions to help achieve “More people using parks”, including providing additional directional signposting and orientation/ interpretive displays at key locations within the park such as at Wilson River Picnic Area and Banda Banda.

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

**Robyn Parker**  
**Minister for the Environment**

## **Erratum**

The strategy regarding cycling given in the summary of actions in Section 8 Implementation Table is inconsistent with the strategies given in section 5.2 of the plan.

Point 5.2.9 in Section 8 of the plan should state:

'Permit cycling on park roads and management trails outside the Willi Willi Wilderness Area where not prohibited by signage. Roads and management trails may be closed to cycling where there is unacceptable environmental impact or risk to cyclists and other users.'

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# 1 INTRODUCTION

## 1.1 Location, Gazettal and Regional Setting

Willi Willi National Park is situated approximately 50 kilometres west of Kempsey on the escarpment of the Great Divide behind the Mid North Coast of New South Wales. Willi Willi National Park was gazetted on 4 April 1996 and, following additions in 1996, 1997, 1999 and 2003, now covers an area of 30 030 hectares.

The land that now forms Willi Willi National Park (herein called “the park”) formerly comprised parts of Mount Boss, Kipparra and Yessabah state forests in the south and south east, parts of Carrai State Forest in the north west, and a significant area of former Vacant Crown Land (VCL) in the parishes of Willi Willi and Dudley in the northern and central portions of the park.

Several former state forest reserves are included within the park. These are Banda Banda Flora Reserve, the Wilson River Primitive Area, A - Tree Blackbutt Flora Reserve, part of Camerons Camp Natural Area and Tinebank Flora Reserve.

The park is bounded by Werrikimbe National Park and Oxley Wild Rivers National Park to the west, state forest to the south, south east and north west; VCL to the north and freehold and leasehold land to the east in the Toorumbbee, McCoys and Dungay Creek areas. Boonanghi Nature Reserve adjoins the north east corner of the park and Kumbatine National Park and State Conservation Area are situated to the east of the park (see map).

Willi Willi National Park is a significant component of a large area of land reserved along the escarpment of the Great Dividing Range between the Mid North Coast and the New England Tablelands, however its character differs from that of the adjacent reserved lands in that it forms part of the dramatic fall to the east from the Tablelands to the lower elevation coastal country (from 1260 to about 95 metres above sea level), loosely known as the “falls country” or “edge country”. Other nearby national parks are either high altitude plateaus e.g. Werrikimbe and Carrai National Parks, are characterised by deeply incised gorge country e.g. Oxley Wild Rivers, Cottan-Bimbang and New England National Parks, or provide vegetated corridors of relatively drier forest types along lower elevation east/west ridge systems e.g. Boonanghi Nature Reserve and Kumbatine and Maria National Parks.

The park straddles the local government areas of Kempsey and Port Macquarie - Hastings and is within the State electorate of Oxley.

The name of the park is derived from the local Dunghutti Aboriginal word “willai” meaning possum. The repetition of the word indicates a plural form translating roughly as “many possums”. The parish to the north of the park, the village of Willawarrin, and one of the oldest local cattle grazing properties in the area also share the same name derivation, demonstrating a long standing connection between the name and the nearby area.

## 1.2 Significance of the Park

The park is of international and national significance for its biological and landscape values and of regional significance for cultural heritage and recreation.

### Key natural values:

- The former Banda Banda Flora Reserve, which is listed as part of the Gondwana Rainforests of Australia World Heritage Area.
- A high diversity of wet forest types, particularly of rainforest types diversified by altitudinal variation;
- One of the most significant stands of Antarctic beech (*Nothofagus moorei*) forest in Australia and several fauna species dependent on this forest type;
- Many threatened species, including all the large forest owls, spotted-tailed quolls (*Dasyurus maculatus*), parma wallabies (*Macropus parma*), potentially genetically pure dingoes (*Canis lupus dingo*), a wide diversity of forest Microchiropteran bats and stream-dependent frog species such as the genus *Mixophyes*; and
- The only known location for the threatened plant *Zieria lasiocaulis*, and populations of the threatened plants *Grevillea guthrieana* and *Sarcochilus hartmannii*.

### Significant landscape values:

- The dramatic escarpment edge along the western boundary of the park;
- The deeply dissected valley systems falling to the east;
- The prominent Kemps Pinnacle and Mount Banda Banda;
- The wild and scenic Wilson River; and
- The contribution the park makes to the naturally vegetated escarpment.

### Key cultural heritage values:

- The cultural significance of Kemps Pinnacle to the local Dunghutti Aboriginal people;
- Traces of past timber harvesting, particularly for red cedar (*Toona ciliata*), white beech (*Gmelina leichhardtii*) and coachwood (*Ceratopetalum apetalum*); and
- The Banda Banda arboretum representing early forestry endeavours.

**Recreation and tourism values:**

- The opportunity for rugged, isolated and self reliant recreation within the Willi Willi Wilderness; and
- Vehicle access to the Wilson River Picnic Area and 4WD opportunities to the north and east of Wilson River, with linkages to Rollands Plains.

**Research and educational values:**

- Study of the ecology of the threatened plant *Zieria lasiocaulis* for which the park supports the only known populations and for which disturbance may be a future management issue;
- Opportunities for the study of several threatened or significant fauna species especially the parma wallaby (*Macropus parma*), spotted-tailed quoll (*Dasyurus maculatus*), potentially genetically pure dingoes (*Canis lupus dingo*), and beech forest specialists such as the olive whistler (*Pachycephala olivacea*) and rufous scrub-bird (*Atrichornis rufescens*);
- Long term monitoring of the fire ecology of a range of wet forest types;
- The educational potential of the Wilson River Picnic Area for NPWS *Discovery* activities and/or secondary school level field studies; and
- Ongoing research by the Australian Museum, University of New England, NPWS and others into diverse topics such as invertebrate fauna, monitoring of the rufous scrub-bird, *Phytophthora*-associated dieback and Bell Miner (*Manorina melanophrys*) studies.

## 2 MANAGEMENT CONTEXT

The NPW Act requires that a plan of management be prepared for Willi Willi National Park. A plan of management is a legal document that outlines how an area will be managed in the years ahead.

### 2.1 Legislative and Policy Framework

The management of national parks in NSW is in the context of a legislative and policy framework, primarily the NPW Act, the NPW Regulation, the *Threatened Species Conservation Act 1995* (TSC Act) and the policies of the NPWS. The policies are based on the legislative background and internationally accepted principles of park management. They relate to nature conservation, Aboriginal and historic heritage conservation, recreation, commercial use, research and communication.

Other legislation, international agreements and charters may also apply to management of the area. In particular, the *Environmental Planning and Assessment Act 1979* (EPA Act) may require the assessment and mitigation of the environmental impacts of works proposed in this plan. The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) also applies in relation to actions that may impact on threatened species listed under that Act and on World Heritage values.

Willi Willi National Park includes 'Ministerial roads' which are vested in the Minister for the Environment on behalf of the Crown for the purposes of Part 11 of the NPW Act. They were created under section 13 of the *Forestry and National Parks Estate Act 1998* to ensure the continuation of access arrangements that existed immediately before the park's creation. This primarily relates to use of these roads for timber hauling and private property access. Whilst Ministerial roads do not form part of the gazetted park area, the management of these roads is subject to the provisions of this plan, the NPW Regulation and the requirements of the EPA Act.

A plan of management is a statutory document under the NPW Act. Once the Minister has adopted a plan, no operations may be undertaken within Willi Willi National Park except in accordance with this plan. This plan will also apply to any future additions to Willi Willi National Park. Should management strategies or works be proposed for Willi Willi National Park or any additions that are not consistent with the plan, an amendment to the plan will be required. Any such amendment will be subject to the public consultation provisions of the NPW Act.

### 2.2 Management Purposes and Principles

#### National Parks

National parks are reserved under the NPW 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 (section 30E), 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.

## **World Heritage**

The section of Willi Willi National Park that was formerly Banda Banda Flora Reserve was inscribed on the World Heritage List in 1986 on the basis of its outstanding natural values. In 1994 this area was included as part of the Central Eastern Rainforests Reserves of Australia (CERRA) World Heritage property. The CERRA property was renamed 'Gondwana Rainforests of Australia' in June 2007.

Gondwana Rainforests of Australia is a disjunct property, comprising almost fifty separate protected areas in southeast Queensland and northeast New South Wales. It represents examples of major stages of the Earth's evolutionary history, of ongoing geological and biological processes, and of biological diversity. A wide range of plant and animal lineages and communities with ancient origins in Gondwana survive in this collection of reserves, many of which are restricted largely or entirely to Gondwana Rainforests of Australia. Gondwana Rainforests of Australia also provides the principal habitat for many threatened plants and animals.

The Australian World Heritage management principles are established under regulations to the EPBC Act. These principles state that the primary purpose of management of a World Heritage property is to identify, protect, conserve, present and, if appropriate, rehabilitate the World Heritage values of the property so they may be transmitted to future generations. The principles also list provisions for planning and impact assessment, and require opportunities be provided for continuing community and technical input in the management of a World Heritage property. While these principles do not legally apply to the management of the state-managed areas within World Heritage properties, the NPWS has agreed that management of the World Heritage listed sections of the planning area will be consistent with these principles.

## **Wilderness**

An area of 23 309 hectares within Willi Willi National Park has been declared wilderness under the *Wilderness Act 1987*. Wilderness areas are large natural areas of land that, together with their native plant and animal communities, are essentially unchanged by human activity. Wilderness areas contribute to the long-term protection of biological diversity and serve as scientific reference areas. An important purpose of wilderness areas is to provide opportunities for solitude and appropriate self-reliant recreation. Protection of natural values, however, has priority over providing for recreational use of wilderness areas.

Management of natural and cultural heritage, introduced species and fire is carried out in wilderness areas in the same manner as other parts of the national park, with special attention to minimising impacts on wilderness values.

In accordance with section 9 of the *Wilderness Act*, wilderness areas are managed according to the following management principles:

- To restore (if applicable) and to protect the unmodified state of the area and its plant and animal communities;
- To preserve the capacity of the area to evolve in the absence of significant human interference; and
- To provide opportunities for solitude and appropriate self-reliant recreation.

## **Regional Forest Agreements**

Regional Forest Agreements are one of the principal 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. This aimed to maintain native forest estate, manage it in an ecologically sustainable manner and develop sustainable forest-based industries. The Statement provided for joint comprehensive assessments of the natural, cultural, economic and social values of forests. These assessments formed the basis for negotiation of Regional Forest Agreements that provide, amongst other things, for Ecologically Sustainable Forest Management.

The planning area falls within the Lower North East NSW Regional Forest Agreement. The process leading up to the Regional Forest Agreement provided for major additions to the reserve system, including additions to Willi Willi National Park.

### **2.3 Management Directions**

In addition to the management principles outlined in section 2.2, the following strategies will be implemented to protect Willi Willi National Park:

- Protecting the physical, biological, cultural and scenic features of the park, as part of the system of protected lands on the eastern escarpment of the Great Dividing Range in north east NSW;

- Controlling, and where possible eradicating, introduced plant and animal species using best practice guidelines;
- Management of wild dogs (affording protection for genetically intact populations of dingoes) and assisting in the protection of neighbouring tenures from predation on livestock;
- Protection of the World Heritage Area and of significant vegetation communities, threatened and significant plant and animal species, and geomorphological features from disturbance and inappropriate use and works;
- Protection of wilderness values and provision of opportunities for solitude and appropriate self-reliant recreation;
- Promoting appropriate land use planning and management amongst neighbours and other land use authorities that will enable the highest practicable protection of the catchments, including the national park, adjacent reserves and other native forest;
- Ongoing good neighbour relations, particularly with regard to fire management, control of stray livestock and management of wild dog impacts;
- Rehabilitation of areas affected by past logging or clearing, including removal and rehabilitation of experimental pine plantations;
- Determining the presence/absence of *Phytophthora cinnamomi* within the park;
- Identifying and protecting Aboriginal sites and places of significance in association with the local Aboriginal community;
- Conservation of significant cultural values and sites as they relate to past land use of the park, including the arboretum at Mount Banda Banda;
- Management of fire to maintain plant and animal communities and provide for the special requirements of threatened species, or application of fire regimes designed to maintain ecosystems;
- Implementation of relevant actions in the Threatened Species Priorities Action Statement to promote the recovery of threatened species, populations and ecological communities and manage key threatening processes;
- Research and monitoring to improve knowledge of the park's resources and to evaluate and adapt management programs; and
- The maintenance of the limited existing visitor facilities (without provision of any additional visitor facilities) outside of the Wilderness Area.

### 3 CONSERVATION OF NATURAL AND CULTURAL HERITAGE

#### 3.1 Geology and Landform

The dominant topography is the north/south oriented escarpment edge of the Great Divide which chiefly comprises the western boundary of the park. Smaller ridge systems run to the east of the escarpment and comprise the dissected descending valleys that form the bulk of the park. Overall the terrain is exceptionally steep and rugged.

The geology of Willi Willi National Park is for the most part Carboniferous mudstone, sandstone and conglomerate. In the McCoys Creek valley in the north, the geology is predominantly the Majors Creek Formation which, along with the lithic sandstones, includes some cherty mudstones. From the Double Head / Flat Top ridge system to the south, the geology is of the Boonanghi Beds although at the higher altitudes along the Coachwood Road (western) boundary of the park, the Kullatine Formation overlies the Boonanghi Beds and includes some diamictites (Northcott 1973).

All of these beds are sedimentary, laid down in the oceans, but later becoming caught up in continental drift, being scraped, folded and faulted to become terrestrial outcrop.

A small area around Mount Banda Banda, and a disjunct continuation from Crown Road then west into Werrikimbe, is an un-named Permian porphyry resulting from intrusive rocks of the New England Batholith. The igneous intrusions of Kemps Pinnacle and Mount Banda Banda provide striking landscape features of the park. These are composed of granite-like rocks such as porphyry, adamellite and rhyolite. During the Triassic era (about 200 million years ago) they intruded into the Boonanghi and Byabarra beds, rising hotly from the depths of the crust and were changed by heating and uplift. These rocks are more resistant to erosion than the sedimentary beds, and are now responsible for much of the rugged terrain of the park. Jacobs Mount adjoining the park to the north east, consists of an adamellite upwelling which has not been exposed by erosion (Department of Mineral Resources 1973). This up-welling close to the Yessabah limestone belt has caused the deposition of a copper ore-body, which can be viewed as brown staining on the side of Jacobs Mount from Carrai Lookout on the Carrai Road.

Upper Permian Gundle Granite also occurs in the Wilson River area in the south of the park. This formation comprises granite, microgranite and aplite (Department of Mineral Resources 1973).

The park's steep and rugged terrain is drained by four major watercourses, the Wilson River to the south east, Toorumbie (also known as Majors or Parrabel) and Dungay Creeks to the east, and McCoys Creek to the north east. The latter three creeks are tributaries of the Macleay River, while the Wilson River is a tributary of the Hastings River. Many small watercourses run between spurs from the major ridges and feed these larger flows.

Three major ridgelines run east - west through the park. The northern boundary of the park follows much of the northern-most ridge through Jacobs Gap toward

McCoys Creek. About 5 kilometres to the south another ridge traverses the Flat Top and Double Head Mountains and crosses the park at its widest point. The third and highest ridge is in the southern part of the park and includes Mount Banda Banda (1260 metres).

### **Desired Outcomes**

- Significant geological and geomorphological features including Kemps Pinnacle, Mount Banda Banda and the eastern escarpment, are protected.
- The scenic values of the park are protected.

### **Strategies**

- Monitor significant geological features to ensure there are no permanent visitor impacts. Access may be restricted to protect sites if necessary.
- Liaise with neighbours and land use authorities as needed to minimise the impact of adjacent land use on views from the main vantage points in the park.

## **3.2 Native Plants**

Willi Willi National Park supports a diverse range of plant communities, reflecting variations in altitude, climate, landform, soil and fire history. These include subtropical, dry, warm and cool temperate rainforests, wet and dry sclerophyll forests and open heath. More than half of Willi Willi National Park is mapped as old growth forest.

The park includes the former Banda Banda Flora Reserve (1610ha). This area was gazetted as a World Heritage site in 1986, in recognition of its particularly well-developed Antarctic beech (*Nothofagus moorei*) – coachwood (*Ceratopetalum apetalum*) cool temperate rainforest, and moist and dry blackbutt (*Eucalyptus pilularis*), New England blackbutt (*E. campanulata*) and white mahogany (*E. acmenoides*) forests. The former flora reserve also contains a population of Guthrie's grevillea (*Grevillea guthrieana*), listed as endangered under the TSC Act.

A detailed flora survey has not been conducted in the park. However, some locations within the park were surveyed for vegetation during resource investigations undertaken in the late 1970s and early 1980s (Dodkin 1982, Floyd 1981, Floyd 1983, Forestry Commission 1984, Roberts 1981, Truyard Pty Ltd 1993). The investigations did not cover a large area of the park, but do include accurate plant species lists and descriptions of vegetation communities at various locations.

The NPWS has modelled vegetation communities in the park based on previous State Forests and North East Forest Biodiversity Survey mapping. These models are useful as a broad management tool but they lack the detailed information on the structure and species composition of the vegetation communities that would be provided by a comprehensive flora survey. Table 1 provides a list of threatened and significant plant species recorded in the park.

A Threatened Species Priorities Action Statement (PAS) has been prepared that identifies strategies and actions to promote the recovery of threatened species, populations and ecological communities and manage key threatening processes (DEC 2006). The PAS incorporates actions from existing recovery plans including the Recovery Plan for *Zieria lasiocaulis* (NPWS 2002a), for which the park is the only known area of occurrence.

Key threats to native plant species and communities include introduced species, inappropriate fire regimes and human activities. Bushfire regimes are a major determinant of the distribution and abundance of native plants in the park.

**Table 1. Threatened and significant plant species recorded in Willi Willi National Park.**

Common name	Scientific name	Status
	<i>Acacia tessellata</i>	2RC-^
Trailing woodruff	<i>Asperula asthenes</i>	Endangered* 3K^
	<i>Cordyline congesta</i>	2RC-^
Mountain laurel	<i>Cryptocarya nova-anglica</i>	3RCa^
Small-leaved laurel	<i>Cryptocarya williwilliana</i>	2RCi^
	<i>Dodonaea megazyga</i>	C-^
Craven grey box	<i>Eucalyptus largeana</i>	3R^
Saw sedge	<i>Gahnia insignis</i>	3RCa^
	<i>Goodenia fordiana</i>	2RC-^
Guthrie's grevillea	<i>Grevillea guthrieana</i>	Endangered*
	<i>Grevillea linsmithii</i>	3RCa^
Big Nellie hakea	<i>Hakea archaeoides</i>	Vulnerable*
	<i>Haloragis exalata</i>	3VCa^
Tree guinea flower	<i>Hibbertia hexandra</i>	Endangered* 3RC-^
	<i>Hibbertia villosa</i>	3KC-^
	<i>Leionema elatius</i> subsp. <i>beckleri</i>	2EC-^
	<i>Leionema elatius</i> subsp. <i>elatius</i>	3K^
Pepper-cress	<i>Lepidium hyssopifolium</i>	Endangered* 3ECa^
Large-flowered milk vine	<i>Marsdenia liisae</i>	3RC-^
Grove's paperbark	<i>Melaleuca groveana</i>	Vulnerable* 3RC-^
	<i>Sarcochilus aequalis</i>	3RC-^
Hartman's sarcochilus	<i>Sarcochilus hartmannii</i>	Endangered* 3VC-^
Willi Willi zieria	<i>Zieria lasiocaulis</i>	Endangered* #

\* Status under TSC Act

# Denotes species nationally threatened under the EPBC Act

^ Denotes species listed as a Rare or Threatened Australian Plant (ROTAP) by Briggs and Leigh (1996)

**ROTAP Codes:**

2 = Geographic range in Australia less than 100km

3 = Geographic range in Australia more than 100km

E = Endangered, in serious risk of disappearing from the wild within 10-20 years if present land use and other threats continue to operate

V = Vulnerable, not presently endangered but at risk over longer period (20-50 years) of disappearing through continued depletion or which occurs on land whose future use is likely to change and threaten its survival

R = Rare; C = Occurs within a conservation reserve; K = Poorly known

a = 1000 plants or more known to occur within a conservation reserve

i = less than 1000 plants are known to occur within a conservation reserve

- = reserve population size is not accurately known

## Desired Outcomes

- The full range of native plant communities and species found in the park are conserved, including the habitat and populations of threatened and significant species.
- The diversity, structure and habitat values of native vegetation communities are conserved, and restored where subject to past disturbance.
- Increased knowledge of the structure and species composition of the vegetation communities within the park.
- Increased knowledge of ecological requirements, including fire ecology of vegetation communities, especially for rare and threatened plant species

## Strategies

- Undertake a vegetation survey of the park to map accurately the distribution, structure and species composition of plant communities.
- Encourage research into the ecological requirements, including fire ecology, of vegetation communities, especially for rare and threatened plant species.
- Introduce a program to monitor the status of the significant plant communities and threatened plant species and to evaluate the success of management programs.
- Implement relevant actions in the Threatened Species Priorities Action Statement, including:
  - maintaining a monitoring program to determine whether populations of *Zieria lasiocaulis* are declining, stable or increasing;
  - undertaking vegetation surveys prior to any proposed action in potential habitat to ensure that populations of *Z. lasiocaulis* are not adversely affected;
  - monitoring the population of *Grevillea guthrieana* at Banda Banda; and
  - surveying potential habitat of *G. guthrieana* at Banda Banda.
- Ensure that management and/or visitor activities do not have a negative impact on threatened or significant plant species.
- Implement a marker system throughout the road and trail network in the park to avoid damage to threatened or significant plant species from road works or weed control programs.
- Allow natural regeneration of cleared/logged areas, and where necessary undertake revegetation using locally indigenous species.

### 3.3 Native Animals

The park forms part of a broad continuous belt of protected areas on the eastern escarpment of north east NSW. Together with Werrikimbe, Oxley Wild Rivers, Kumbatine and Maria national parks, Boonanghi Nature Reserve, and Mount Boss, Kipparra and Ballengara State forests a substantial naturally vegetated corridor is provided between the tableland and coastal lands. Collectively these reserves provide a stronghold for the conservation of native animals in the area.

A total of 177 vertebrate animal species have been recorded in the park, including 15 amphibians, 20 reptiles, 102 birds and 40 mammals (Robinson 2000). These include 22 threatened species (refer table 2).

**Table 2. Threatened animal species recorded in Willi Willi National Park.**

Common name	Scientific name	Legal Status
<b>Amphibians and Reptiles</b>		
New England tree frog	<i>Litoria subglandulosa</i>	Vulnerable*
Booroolong frog	<i>Litoria booroolongensis</i>	Endangered*
Stuttering barred frog	<i>Mixophyes balbus</i>	Endangered* #
Giant barred frog	<i>Mixophyes iteratus</i>	Endangered* ^
Sphagnum frog	<i>Philoria sphagnicolus</i>	Vulnerable*
<b>Bats</b>		
Eastern false pipistrelle	<i>Falsistrellus tasmaniensis</i>	Vulnerable*
Golden-tipped bat	<i>Kerivoula papuensis</i>	Vulnerable*
Little bentwing-bat	<i>Miniopterus australis</i>	Vulnerable*
Eastern bentwing-bat	<i>Miniopterus schreibersii oceanensis</i>	Vulnerable*
<b>Other Mammals</b>		
Rufous bettong	<i>Aepyprymnus rufescens</i>	Vulnerable*
Spotted-tailed quoll	<i>Dasyurus maculatus</i>	Vulnerable* ^
Parma wallaby	<i>Macropus parma</i>	Vulnerable*
Yellow-bellied glider	<i>Petaurus australis</i>	Vulnerable*
Squirrel glider	<i>Petaurus norfolcensis</i>	Vulnerable*
Koala	<i>Phascolarctos cinereus</i>	Vulnerable*
<b>Birds</b>		
Rufous scrub-bird	<i>Atrichornis rufescens</i>	Vulnerable*
Glossy black cockatoo	<i>Calyptorhynchus lathami</i>	Vulnerable*
Powerful owl	<i>Ninox strenua</i>	Vulnerable*
Olive whistler	<i>Pachycephala olivacea</i>	Vulnerable*
Wompoo fruit-dove	<i>Ptilinopus magnificus</i>	Vulnerable*
Masked owl	<i>Tyto novaehollandiae</i>	Vulnerable*
Sooty owl	<i>Tyto tenebricosa</i>	Vulnerable*

\* Status under TSC Act

# Denotes species listed as nationally vulnerable under the EPBC Act

^ Denotes species listed as nationally endangered under the EPBC Act

There are a number of significant species predicted to occur within the park that have not been recorded in previous surveys, including the Hastings River mouse (*Pseudomys oralis*), red-legged pademelon (*Thylogale stigmatica*), greater broad-

nosed bat (*Scoteanax rueppellii*) and brush-tailed phascogale (*Phascogale tapoatafa*).

Fauna surveys conducted in the park to date have not focussed on surveying reptiles. As such, there is very little information regarding the presence of reptile species within the park.

A Threatened Species Priorities Action Statement (PAS) has been prepared that identifies strategies and actions to promote the recovery of threatened species, populations and ecological communities and manage key threatening processes (DEC 2006).

The whole of the park is identified as an area for dingo management under the *Rural Lands Protection Act 1998 (RLP Act)*. This has implications for wild dog management within the park (see Section 4.3.2).

The Key Habitats and Corridors project in north east NSW (Scotts 2003) identifies half of Willi Willi National Park as a regional corridor and half again as key fauna habitat. Key habitats are areas of predicted high conservation value for forest fauna. A habitat corridor facilitates important ecological processes such as migration, colonisation and interbreeding of plants and animals between two or more larger areas of habitat (Scotts 2003).

Key threats to native animal species include fire, introduced species, erosion, stream degradation and inappropriate human activities. Protection of habitat and appropriate bushfire regimes are a major determinant of the distribution and abundance of native animals in the park.

### **Desired Outcomes**

- The full range of native animal species present in the park are conserved including the habitat and populations of threatened species.
- There is increased knowledge of the ecology, distribution and habitat requirements of native animal species, particularly threatened and significant native animal species.
- Populations of pure dingoes in the park are conserved.

### **Strategies**

- Protect the habitat of threatened and biogeographically significant native animals from visitor impacts, pest species and inappropriate fire regimes.
- Continue to record the distribution of threatened and significant native animal species. In particular, undertake targeted surveys for significant species predicted to occur within the park.
- Implement relevant actions in the Threatened Species Priorities Action Statement.
- Manage the area in accordance with the NPWS Wild Dog Policy as a dingo management area.

- Opportunistically collect DNA samples from wild dogs/dingoes to enhance knowledge of the dingo population integrity.
- Encourage research into the genetics, movement, population dynamics and distribution of dingoes so as to define core dingo conservation area boundaries.
- Undertake a survey for reptiles during summer.
- Encourage the monitoring of native animals.

### **3.4 Aboriginal Heritage**

Aboriginal communities have an association with and connection to the land. The land and water 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 from each other and need to be managed in an integrated manner across the landscape.

The traditional custodians of the area were the Dunghutti Aboriginal people who occupied the Macleay valley and its hinterland. It is said that the Dunghutti Aboriginal people would move into the “falls country” in the warmer months to harvest food and practise important social rituals. The Nguloongooras (Wise Elders) would perform secret ‘increase rituals’ on sacred mountain tops such as Kemps Pinnacle, near the western boundary of the park, to extend their food supply. Placing limits on certain species during seasonal variations would allow for a natural increase in food resources. It was the wish of their great deity, Woormprahl, for them to create this balance with nature. Birthing rituals and initiations are also believed to have been conducted in the park (Ray Kelly pers. com.). Kemps Pinnacle is the only Aboriginal site recorded in the park (Creamer 1981), but other sites are probably known to the Dunghutti people.

While the NPWS has legal responsibility for the protection of Aboriginal sites it acknowledges the right of Aboriginal people to make decisions about their own heritage. It is therefore policy that Aboriginal communities be consulted and involved in the management of Aboriginal sites and related park management issues and the promotion and presentation of Aboriginal culture and history. The park is within the area of the Kempsey Local Aboriginal Land Council and the Dunghutti Elders Incorporated.

#### **Desired Outcomes**

- Aboriginal cultural values associated with the park are recognised, protected and presented appropriately in partnership with the local Aboriginal people.
- The broader community has an understanding of the cultural importance of the park to local Aboriginal people.
- Increased knowledge of the Aboriginal cultural values associated with the park.

#### **Strategies**

- Encourage a cultural heritage assessment of the park, including research into the Aboriginal cultural values associated with the park.
- Manage Aboriginal heritage in the park in consultation with the Kempsey Local Aboriginal Land Council, Dunghutti Elders Incorporated and other relevant Aboriginal community organisations and individuals.
- Undertake an archaeological survey and cultural assessment prior to all works with the potential to impact on Aboriginal sites and places.
- Protect Aboriginal sites, objects, places and culturally significant features from damage by human activity and fire.
- Do not publicise the location of Aboriginal sites and places except where the agreement of relevant Aboriginal community organisations has been obtained. Prior to any promotion of a site, prepare a conservation study and undertake any management work necessary to protect the site or place.
- Interpret the Aboriginal heritage of the park in consultation with Aboriginal community representatives.

### **3.5 Historic Heritage**

The park and much of the surrounding lands were subject to selective logging by cedar getters, the timber being so valuable that extreme means were taken to harvest even the most remote and difficult to access areas. Later coachwood forests were accessed for rifle butts and aircraft frames during World War II. Upon the release of these areas from Department of Defence reservation they and other rainforest areas were logged for furniture timbers and plywood. Several sawmills operated in Carrai State Forest adjoining the park during and after World War II, including one at Haydonville (named by Bill Haydon, the “Cedar King”) and one at Kookaburra which closed in 1969 (Yabsley & Davies 2009). In the 1950s the area was opened up to hardwood (Eucalypt) logging and most of the ridges and less severe slopes were logged for general building timbers. Extensive grazing was carried out in areas of moderate slope with bladey grass (*Imperata cylindrica*) understorey, which was extended by spring burning.

Only extremely steep slopes, minor creek flats or specially reserved areas such as Banda Banda and Wilson River Flora Reserves remained untouched.

#### **Arboretum at Mount Banda Banda**

The Banda Banda Arboretum was planted and fenced by the then NSW Forestry Commission in 1964. Situated amongst ancient Antarctic beech and coachwood rainforest, it was used to investigate how exotic conifers grew in high altitude climates. Conifers from seven different countries were planted. Three of them, the monkey puzzle (*Araucaria imbricata*), Monterey pine/radiata pine (*Pinus radiata*) and the Californian redwood (*Sequoia gigantea*), are now listed as threatened species within their own native habitat although they are now commonly cultivated elsewhere. Other exotic trees planted included Japanese cedar (*Cryptomeria japonica*) and

Douglas fir (*Pseudotsuga taxifolia*). The arboretum is considered by NPWS to be of historic importance because of the long association of forestry with the area.

### **Desired Outcomes**

- Historic heritage resources are identified, and where appropriate, protected and interpreted.

### **Strategies**

- Retain fence posts and strainers but remove wire from internal fences surrounding the Banda Banda arboretum.
- Develop a management plan for Banda Banda arboretum which will include:
  - Monitoring of exotic conifer seedling spread and their control if necessary;
  - Control of other weed species in the arboretum;
  - Consideration of whether the pines should be removed; and
  - Interpretation of the arboretum.

## **4 PARK PROTECTION**

### **4.1 Soil Erosion**

A number of significant landslips have occurred in the park. Some of these landslips involved many thousands of cubic metres of soil material and in one case, carried material almost a kilometre downslope and descended many hundreds of metres. This demonstrates the tenuous nature of soils on the extreme slopes within the park.

While there is very little specific information on the soil types in the park, superficial observation at many sites would suggest many of the soils on the extreme slopes are skeletal. While these sites sometimes support exceptional forest growth, the surface of the ground is frequently characterised by loose scree and boulders.

In most of the park there is very little opportunity for the development of deeper alluvial or colluvial soils. However a few very small creekside flats on the major creek systems support reasonable soils, and these tend to support small patches of warm temperate and/or sub-tropical rainforest.

Irrespective of the mechanical properties of the soils in the park, the terrain dictates that the erosion potential is significant.

#### **Desired Outcomes**

- Human induced soil erosion in the park is minimised.

#### **Strategies**

- Design and undertake all works in a manner that minimises soil erosion.
- Maintain adequate drainage on roads and trails in the park. Where necessary restrict vehicle usage on roads and trails that are prone to higher rates of erosion.
- Temporarily restrict access to some roads and trails during and immediately after prolonged periods of rain, as required.

### **4.2 Water Quality and Catchment Management**

Four major catchments drain the park, all flowing generally to the east. These are McCoys Creek, Toorumbie Creek and Dungay Creek (all tributaries of the Macleay River) and the Wilson River (a tributary of the Hastings River).

#### **Desired Outcomes**

- The park's catchment values and the water quality and health of park streams are maintained.

#### **Strategies**

- Design and undertake all works in a manner that minimises water pollution.

## 4.3 Pest Species

### 4.3.1 Introduced Plants

Introduced plants, commonly referred to as weeds, are species that are not native to an area. These species have a range of impacts on natural and cultural values and can reduce the economic viability of agricultural enterprises on adjoining properties.

Red and pink varieties of the introduced plant Lantana (*Lantana camara*) occur in many areas of the park. Lantana is declared a noxious weed and is considered a weed of national significance. The presence of Lantana is likely to be strongly linked to soil disturbance history (both human and natural disturbances) and an available seed source. It is likely to have been spread by animals, floods, heavy machinery and vehicles. Invasion, establishment and spread of all variants of *L. camara* has been declared as a key threatening process under the TSC Act (NSW Scientific Committee 2006).

A range of other weeds is known in the park and these can generally be grouped into two major categories - roadside weeds and bushland weeds.

**Table 3. Introduced plant species recorded in Willi Willi National Park.**

Common name	Scientific name	Status	Problem areas
Giant Parramatta grass	<i>Sporobolus fertilus</i>	#	roadside
Giant paspalum	<i>Paspalum dilatatum</i>		roadside
Cobblers pegs	<i>Bidens pilosa</i>		roadside
Crofton weed	<i>Ageratina adenophora</i>		roadside
Timothy grass	<i>Phleum pratense</i>		roadside
Fireweed	<i>Senecio lautus</i>		roadside
Blackberry	<i>Rubus fruticosus</i>	Noxious	roadside
Lantana	<i>Lantana camara</i>	Noxious #	bushland/roadside
Balloon cotton bush	<i>Gomphocarpus physocarpus</i>		bushland
Ink weed	<i>Phytolacca octandra</i>		bushland

# identified as part of a key threatening process within NSW

Four plantations of exotic conifers, planted by the then Forestry Commission of NSW, are within the park and are bounded by the Willi Willi Wilderness Area. The arboretum plantation at Banda Banda is considered to be of historic value (see section 3.5). However there is some evidence that introduced conifer species from the other three plantations are spreading into adjacent forest.

### 4.3.2 Pest Animals

Pest animals, including pigs, cats, foxes, cattle (stray and/or wild), rabbits, black rats, house mice and wild dogs (other than the resident dingoes) are known from the park. Given the proximity of a number of goat and deer farms close to the boundary of the park, there is also some risk that feral goat and deer herds may be established by escape of these animals.

Wild dogs and pigs are likely to present the greatest immediate threat to the conservation values of the park. The rough terrain of the park and the presence of a significant wild dog/dingo population possibly explains the apparent low densities of some introduced species such as foxes, pigs, rabbits and to some extent wild cattle. Pigs are a threat as, in addition to the damage they cause to waterways, they may be a vector for *Phytophthora cinnamomi* (see section 4.5 Dieback) and for diseases infectious to other animals. Predation, habitat degradation, competition and disease transmission by Feral Pigs (*Sus scrofa*) has been declared as a key threatening process under the TSC Act (NSW Scientific Committee 2004).

Wild dogs have been reported and recorded from most areas of the park. Historically, control programs using aerially delivered 1080 meat baits have been undertaken in response to stock loss on neighbouring properties particularly to the north and northeast of the park. This has been replaced by mound baiting and soft jaw trapping techniques where necessary within the park.

Wild dogs are declared pest animals under the *Rural Lands Protection Act 1998* (RLP Act) and hence the NPWS has a statutory obligation to control wild dogs on its estate. Wild dogs can be divided into three groups - dingoes, hybrids with domestic dogs and feral dogs (domestic dogs gone wild). Under the RLP Act, some public lands including the park, are considered to have high quality dingo habitat and are consequently listed as Dingo Management Areas. These areas are to be managed with the dual objective of controlling wild dogs where necessary to minimise livestock attacks while at the same time conserving dingoes. The RLP Act requires the NPWS to assist in the preparation and implementation of a wild dog management plan for the Willi Willi Dingo Management Area (NPWS 2005a). This plan is incorporated into the Wild Dog Management Plan prepared for the Kempsey Rural Lands Protection Board District (DPI 2008).

Biodiversity damage caused by feral cats is difficult to quantify, however, given the prey size and type preferred by cats generally, and the presence of several such threatened species within the park, the control or management of feral cats must be regarded as a priority. Concerns about the impact have led the NSW Scientific Committee to list predation by feral cats as a key threatening process under the TSC Act. The NPWS is preparing a threat abatement plan to assist in reducing the impact of feral cats on threatened species.

The Mid North Coast Region Pest Management Strategy (DECC 2008) identifies priorities and guidelines to control pest species in the NPWS Mid North Coast Region. This will guide the management of pest species in the park.

### **Desired Outcomes**

- The impact of introduced species on native plants and animals, neighbouring properties and catchment values is minimised.
- Control programs have minimal impacts on the environment and on non-target species.
- Neighbours are encouraged to assist in cooperative management of introduced species to enhance and extend the outcomes of management programs.

## **Strategies**

- Carry out weed and pest animal control in accordance with the Mid North Coast Region Pest Management Strategy. Priority will be given to exotic conifers, Lantana, wild dogs and cats.
- Develop and implement cooperative and integrated weed and pest animal control strategies with neighbours and the Mid Coast Livestock Health and Pest Authority.
- Encourage maintenance of effective fencing of boundaries with grazing properties to prevent domestic stock from entering the park. Provide fencing assistance (through fencing agreements) where possible and appropriate to exclude stock.
- In accordance with the approved Wild Dog Management Plan (DPI 2008), target management of wild dogs to the north east of the park (eastern end of McCoys Trail to east of Jacobs Mountain) where the likelihood both of impacts on neighbours livestock and the hybrid risk to dingoes is greatest.
- Continue research into dingoes including dingo DNA sampling within the park to determine areas of pure dingoes and core dingo habitat.
- Implement management techniques to reduce the spread of weeds when using vehicles and machinery.
- Monitor and where possible map the abundance and distribution of introduced plants and pest animals.
- Implement weed and pest animal actions from threat abatement plans in the Threatened Species Priorities Action Statement.

### **4.4 Fire Management**

Fire is a natural feature of the Australian environment and is essential to the survival of some plant and animal 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 TSC Act.

The primary fire management objectives of the NPWS are to protect life and property and community assets from the adverse impacts of fire, whilst managing fire regimes to maintain and protect biodiversity and cultural heritage (NPWS 2005b).

Due to the extremely rugged nature of the park, the system of trails available for use in fire management operations in the park is limited. The major trail systems are shown in Map 1. Many of these trails have management limitations due to their exposed nature and the likelihood of frequent and sometimes significant tree falls.

### **Ecological requirements**

The effect of bushfire regimes on the ecology of the park is likely to be more pronounced in the northeast and southeast of the park, where the vegetation is

dominated by drier eucalypt forest types. Bushfire regimes also affect nutrient cycles, erosion patterns, weed dispersal and germination, and hydrological regimes.

Use of fire retardants (a detergent like chemical often added at the time of water delivery to the fire) by fire fighting vehicles and aircraft has serious implications for amphibians and its use in the park will be avoided particularly near streams where it can affect dependant species such as the barred river frogs (*Mixophyes* spp.) and wet/soak area specialists like sphagnum frogs (*Phyllorhina sphagnicolus*).

Requirements for most plant species can be summarised on the basis of vegetation communities and there is a threshold in fire regime variability, which marks a critical change from a high species diversity to low species diversity. The following regime guidelines have been identified for the reserve.

**Table 4. Fire interval guidelines for protection of vegetation communities.**

<b>Vegetation Community</b>	<b>Minimum Interval (years)</b>	<b>Maximum Interval (years)</b>	<b>Notes</b>
Rainforest	n/a	n/a	Fire should be avoided
Wet sclerophyll forest	25	60	Crown fires should be avoided at the lower end of the interval range
Grassy dry sclerophyll forest	5	50	
Semi-mesic grassy forest	10	50	Crown fires should be avoided in the lower end of the interval range
Heathland	7	30	

Source: Kenny *et al.* (2003).

## **Fire history**

Information regarding fire history within the park prior to 1996 is incomplete and varies in quality. Several locations within and immediately adjacent to the park support fire scarred trees and excessively simplified floristic structural diversity, suggesting overly frequent fires from an ecological viewpoint. These areas reflect the long-standing use of fire to improve native pasture grazing.

Fire history has been accurately recorded and mapped since 1996. There were 12 separate fires within the park between 1996 and 2006. Most of these fire events have been the result of uncontained hazard reduction burning in neighbouring lands, particularly in the north east and central sections of the park.

Other fire ignition sources within the park include lightning strikes and suspected arson.

## **Cooperative strategies and arrangements**

Under the *Rural Fires Act 1997* the NPWS is a fire authority and is responsible for controlling fires on the park and ensuring that they do not cause damage to other land or property. An important part of fire management is participation in local co-operative fire management arrangements, including implementation of Bush Fire Risk Management Plans developed by District Bush Fire Management Committees

(BFMC). The NPWS is an active member of both the Lower North Coast and Manning bush fire management committees.

A fire management strategy has been prepared for the park (Bushfire & Environmental Services 1998) and forms part of the Operational and Risk Management Strategies in the local zones of the Rural Fire Service. The park's current fire management strategy needs revising and updating to cover additions to the park since 1998.

The NPWS uses a zoning system for bushfire management which is compatible with the zoning used by the Lower North Coast and Manning Bush Fire Management Committees in their bushfire risk management plans. Annual hazard reduction programs for the park, which may include mechanical fuel reduction techniques, prescribed burning and fire trail works, are submitted to the BFMC.

### **Desired Outcomes**

- The risk of bushfire to life and property, both within and adjacent to the park, is minimised.
- Fire regimes are appropriate for the conservation and enhancement of native plant and animal communities and the maintenance of biodiversity.
- The potential for the spread of bushfires on, from, or into the park is minimised.
- Aboriginal sites, historic places and culturally significant features are protected from the impacts of fire and fire related management activities.

### **Strategies**

- Regularly review and update the Reserve Fire Management Strategy for the park.
- Ensure the locations of known populations of threatened plant and animal species and locations where those species are predicted to occur, are clearly identified in future Fire Management Strategy documentation.
- Use prescribed fire (where possible) to achieve a variety of fire regimes that maintain fire thresholds for each vegetation community in accordance with the Fire Management Strategy.
- Plan to exclude fire from all rainforest areas within the park, the Banda Banda arboretum, and habitats of threatened species known to be susceptible to fire.
- Avoid the use of heavy machinery for fire suppression other than where appropriate on existing fire management trails or on old timber snigging trails which remain clearly delineated. No new trails are to be constructed.
- No new remote helipads will be constructed. Ensure that suitable existing sites are clearly documented in the rewritten Fire Management Strategy.
- Fire fighting retardants will not be used in rainforests, World Heritage Areas, and in permanent soaks, creeks and rivers. Written approval from the Regional Manager must be given before fire fighting retardants are used elsewhere within the park.

- Rehabilitate areas disturbed by fire suppression as soon as practical after the fire.
- Encourage research into the ecological effects of fire in the park, particularly the fire response of significant plant species and the fire requirements of the plant and animal communities.
- Continue to participate actively in the Lower North Coast and Manning Bush Fire Management Committees. Maintain close contact and cooperation with neighbours, Council and Rural Fire Service (RFS) officers and RFS brigades.
- Establish cooperative relations with neighbours and carry out fuel management for mutual protection.
- Undertake fuel reduction programs, trail maintenance, research and monitoring programs in accordance with NPWS policies and the Reserve Fire Management Strategy.

#### 4.5 Dieback

##### ***Phytophthora cinnamomi***

*Phytophthora cinnamomi* is a soil borne pathogen belonging to the water mould group (*Oomycetes*). *P. cinnamomi* has been recorded in the neighbouring Werrikimbe National Park and is thought to be present in areas of Willi Willi National Park. The reproductive structures that spread *P. cinnamomi* (sporangia and clamydospores) form on vegetative mycelia in soil and plant roots, and often then spread throughout the plant. *P. cinnamomi* infects a large range of plant species and susceptible species display a range of symptoms. In some circumstances, *P. cinnamomi* may contribute to plant death where there are other stresses present such as waterlogging, drought, and perhaps wildfire (NSW Scientific Committee 2002).

The spread of *P. cinnamomi* occurs through movement of spores which may swim to new hosts or be dispersed over large distances in flowing water, such as storm runoff. Some spread within a site may be by mycelial growth from infected roots to roots of healthy plants. Propagules of *P. cinnamomi* may also be dispersed by vehicles, animals (eg. feral pigs) and walkers and movement of soil used in the horticultural industry. Infection of native plants by *P. cinnamomi* is listed as a key threatening process under the TSC Act (NSW Scientific Committee 2002).

Dieback caused by the root-rot fungus (*P. cinnamomi*) is listed as a key threatening process under the *Environmental Protection and Biodiversity Conservation Act 1999*.

##### **Bell Miner Associated Dieback (BMAD)**

Bell Miner Associated Dieback (BMAD) is currently spreading rapidly through sclerophyll forests in New South Wales and is thought to be occurring in the park. Over-abundant populations of native bell miners or bellbirds (*Manoria melanophrys*) appear to be associated with a form of eucalypt dieback which has been listed as a key threatening process under the TSC Act.

BMAD is generally characterised by trees stressed and dying, high populations of psyllids and other sap-sucking insects and high numbers of bell miners (which, with their aggressive territorial behaviour, drive away insectivorous birds that would otherwise help to control insect numbers). Alterations to the forest structure include depleted canopy and mid-storeys, and replacement of understoreys with dense shrubby vegetation, often dominated by lantana. Weed invasion, drought, logging, soil nutrient changes, and changing fire and grazing regimes have all been implicated in the spread of BMAD (Bell Miner Associated Dieback Working Group 2004).

BMAD is prevalent throughout Kumbatine National Park, which has been identified as being at high risk from further dieback due to its vegetation types and previous disturbance levels. Given that Willi Willi National Park is congruous with Kumbatine National Park in terms of its vegetation types and landmass, it is important to support control options and research programs.

### **Desired Outcomes**

- *Phytophthora cinnamomi* dieback and BMAD is controlled.

### **Strategies**

- Support the Bell Miner Associated Dieback Working Group by monitoring dieback in the park and trialing relevant programs.
- Determine the presence/absence of *P. cinnamomi* within the park and monitor the possible spread within the park.
- If required, close roads and management trails to quarantine areas possibly affected by *P. cinnamomi*.

## 5 VISITOR OPPORTUNITIES AND EDUCATION

### 5.1 Information Provision

Park facilities and services provide opportunities to enjoy, appreciate and understand the value of our natural and cultural heritage. Information provision in appropriate locations within the park assists the protection of natural and cultural heritage, promotes conservation and increases the enjoyment and satisfaction of visitors.

The park's natural and cultural features of interest to the visitor and worthy of interpretation include:

- Rainforest, in particular the subtropical rainforest at lower altitudes and the cool temperate rainforest at higher altitudes.
- The Wilson River and its tributaries, including the waterfall on Tinebank Creek.
- Mount Banda Banda, a prominent landmark.
- A spectacular section of the Great Divide, from Mount Banda Banda to Double Head Mountain.
- The Willi Willi Wilderness Area.
- The Banda Banda World Heritage area.
- The Banda Banda arboretum.
- McCoys Lookout and Carrai Lookout (outside of the park), both on the Carrai Road.
- Kemps Pinnacle, a significant Aboriginal site.
- Trees of particular significance – eg Antarctic beech trees, strangler figs, red cedars.

These features will be promoted and interpreted to visitors in a manner that protects their special values and encourages appropriate use. Provision of information about the park will involve three levels:

- Promotion to increase community awareness of the existence of the park, its conservation importance and visitor opportunities;
- Orientation to enable visitors to find their way around the park and to introduce them to its landscape; and
- Interpretation of individual components of the park's environment in order to increase visitor understanding and enjoyment of the park's values.

### Desired Outcomes

- Visitors and the local community are aware of, understand and support the park's natural and cultural values and their responsibilities for minimal impact use.
- Visitors are aware of the park's recreation opportunities and can easily find their way to facilities.

- The park is a useful educational resource for local schools and community organisations.
- There is increased awareness about wilderness and world heritage values and the current wilderness/world heritage boundaries.

### **Strategies**

- Maintain visitor facilities only on the periphery of the park.
- Produce an interpretation plan for the park.
- Emphasise the following themes in promotion and interpretation programs:
  - World Heritage
  - Wilderness
  - Rainforest - forest type diversity
  - Threatened species
  - Red cedar history
  - Significance to local Aboriginal people
  - State Forest Flora Reserve history
- Provide additional directional signposting within the park at key locations.
- Place orientation/interpretive displays and signs at Wilson River Picnic Area and Banda Banda Car Park.
- Support and assist educational use of appropriate areas of the park by schools, community groups and individuals through provision of information and the NPWS Discovery program.

## **5.2 Recreation Opportunities**

Recreation opportunities provided in national parks are generally those at the low key end of the spectrum in natural settings. Recreational uses which are ecologically sustainable and that directly contribute to the visitor's understanding and appreciation of the park are considered appropriate.

Management of visitor use in an ecologically sustainable way may require placing limits on the number of access points, designing facilities to ensure that numbers of visitors and the style of use is appropriate for the site, and promotion of minimal impact use. The provisions set out below are designed to maintain the low key, scenic, natural settings that are the special feature of the park and to provide for future use in a manner that protects ecological integrity and cultural heritage values.

Provision for visitor use of Willi Willi National Park has been considered in a regional context. Public land managed by the NPWS and other authorities in the region provides diverse opportunities for recreation such as camping, horse riding, walking and four-wheel driving.

As Willi Willi National Park is primarily a wilderness area, recreational use of most of the park will be limited to self-reliant wilderness experiences. No visitor facilities will be provided in the wilderness, and no new visitor facilities will be developed outside the wilderness.

### **Public vehicle access**

The main access to the park is via Wauchope or Kempsey. Hastings Forest Way provides access to the southern and western boundaries of the park from Wauchope, and Carrai Road provides access to the northern boundary of the park from Kempsey. It is also possible to access the park from the west via a 4WD road through Werrikimbe National Park from the Oxley Highway.

The roads servicing the park are shown in Map 1. For the purposes of this plan, three types of vehicle access are defined:

- Park road (suitable for all vehicles) – unsealed gravel roads available for use by public vehicles. Generally suitable for 2WD vehicles in all weather conditions.
- Park road (suitable for 4WD only) – unsealed gravel roads available for use by public vehicles. Generally only suitable for 4WD vehicles because of poorer standard of road, stream crossings etc. North Wilson Road and Bobs Ridge Road are 4WD roads.
- Management trails – not available for public vehicle access. Maintained to a lower standard than park roads and are for management purposes only. Most are at least partially within the Willi Willi Wilderness Area.

Recreational four wheel driving has been carried out for many years within the park, particularly in the North Wilson/Bobs Ridge Road area and the Racecourse/Coachwood Road areas. As these roads connect to other recreational venues and remote camping areas, their use for recreational four wheel driving will be allowed to continue. This usage may be terminated either temporarily or permanently if monitoring shows undue road damage due to private vehicle use. North Wilson Road and that section of the park to the east of North Wilson Road are not included in the declared Willi Willi Wilderness Area. Coachwood Road and Racecourse Trail are also excluded from the declared Wilderness Area. Coachwood Road and North Wilson Road are suitable for dry weather access by 4WD vehicles only. These roads may be closed during periods of wet weather, when public safety risk becomes unacceptable and for maintenance. Signs will be installed on Hastings Forest Way and Carrai Road to advise visitors of closures.

### **Day visits and walking tracks**

Wilson River Picnic Area was established by the NSW Forestry Commission (now Forests NSW) in the 1960s within the then Wilson River Primitive Reserve. It is accessed via Wilson River Road from the Hastings Forest Way. Facilities include a parking area, toilets, shelter shed, interpretation signage, and barbecues.

Three walks start from Wilson River Picnic Area; Waterfall, Botanic, and Palm Grove walks. Waterfall walk is 3.6km return with a moderate grade. This track passes close to a magnificent strangler fig, then through sub-tropical and warm temperate

rainforest, to a waterfall and pool. Botanic walk is a 300m loop with a gentle grade. Palm Grove walk is 1km return with an easy grade and leads from the Wilson River Picnic Area through sub-tropical rainforest and blue gums to the Glade Picnic Area beside the Wilson River. A picnic table and parking for a small number of vehicles are provided at the Glade Picnic Area.

The arboretum at Mount Banda Banda is accessed via Banda Road from the Hastings Forest Way. Public vehicle access on Banda Road, which is excluded from the Wilderness Area, terminates at the junction with Loop Trail. An interpretation display has been installed at this location and it is proposed to delineate a small parking area and to gate both Loop Trail and Banda Road beyond this point. It is possible to walk around the Banda Banda Forest Loop, 3.7km circuit, moderate grade, past the arboretum and through the Antarctic beech forest within the World Heritage area.

Self-reliant bushwalking can be undertaken in many areas within the park. Management trails also provide walking opportunities.

### **Camping**

Self-reliant pack or bush camping occurs in some of the more remote and rugged areas of the park, including in the Willi Willi Wilderness Area. Current use levels are low. No formal camping areas or facilities are provided and campers are responsible for removing their own rubbish and minimising environmental impacts.

Camping areas with facilities are provided at Brushy Mountain and Plateau Beech in the adjoining Werrikimbe National Park, and at Cobrabald beside the Wilson River in the adjoining Mount Boss State Forest.

### **Cycling**

The park offers limited opportunities for cycling because most of the park is declared wilderness and cycling within wilderness areas is generally not allowed under NPWS policy. Cycling is permitted on the roads within the park, however the roads are steep and narrow.

### **Horse riding**

As the majority of the park is declared wilderness, horse riding is not permitted in these areas under NPWS policy. The remaining areas of the park are generally unsuitable for horse riding due to the potential conflict with other park users, potential impacts on rare plants and the safety issues of riding on the steep and narrow roads. Horse riding is permitted in neighbouring parks, such as Kumbatine National Park and State Conservation Area and Oxley Wild Rivers National Park.

## **Commercial or group activities**

Commercial operations can assist management through encouraging appropriate visitor use and understanding of park values. They contribute to the range of recreation, interpretive and educational opportunities for visitors and can provide high quality visitor experiences that may not otherwise be available.

Conversely, these activities have the potential to impact on park values and on the experience of other visitors due to competition for facilities and overcrowding at sites.

Any commercial activities conducted in the park are required to be licensed under the NPW Act and will be subject to conditions of use. There are currently three commercial tour operators licensed to undertake tours to the Wilson River Picnic Area and Banda Banda arboretum.

## **Desired Outcomes**

- Visitor use is sustainable.
- Recreation activities are low key, compatible with reserve values and legislative principles, and complement regional recreational opportunities.

## **Strategies**

- Provide public vehicle access in accordance with Map 1. Access may be restricted to prevent damage during periods of wet weather and/or to ensure public safety.
- Install signage, gates and bollards as necessary to prevent public vehicle access to the management trail system and the Willi Willi Wilderness Area.
- Provide a vehicle turn-around and small parking area at the junction of Banda Road and Loop Trail, outside of the wilderness area.
- Maintain existing facilities at Wilson River Picnic Area and Glade Picnic Area.
- Encourage visitors to use fuel stoves or bring their own firewood into the park.
- Maintain the Waterfall, Botanic and Palm Grove walking tracks at Wilson River Picnic Area.
- Continue to allow self-reliant bush walking throughout the park.
- Allow minimal impact self-reliant pack or bush camping throughout the park at locations more than 500 metres from roads, walking tracks and visitor facilities. Place further restrictions on pack camping if needed to minimise impacts.
- Permit cycling on park roads, and management trails outside the Willi Willi Wilderness Area where not prohibited by signage.
- Cycling will not be permitted off roads or on walking tracks, or on management trails where the prohibition is signposted.
- Roads and management trails may be closed to cycling where there is unacceptable environmental impact or risk to cyclists and other users.

- Do not allow horse riding in the park.
- Assess commercial and group activity applications with respect to impacts on park values. Activities deemed to have a significant impact will not be permitted.
- Group sizes will be limited to up to 10 persons within the Willi Willi Wilderness Area, and up to 20 persons in those areas of the park outside of the Willi Willi Wilderness Area. Visitor group size limits outside the wilderness may be varied if the prior written consent from NPWS is obtained.
- License all commercial operators using the park and apply conditions as necessary to minimise impacts.
- Monitor the impacts of visitor use and if necessary close areas permanently or temporarily or otherwise restrict access or use if there is unacceptable damage to natural or cultural values or conflict with other users, or if use may be increasing the risk of spread of *P. cinnamomi*.

## **6 RESEARCH AND MONITORING**

Scientific study can improve understanding of the park's natural and cultural heritage and the processes which affect them. Research can also establish the requirements for management of particular species and communities.

Research efforts should be directed towards the areas of greatest need and will concentrate on threatened and significant plants and animals, dingo/wild dog management, cultural heritage values and the effects of fire on the park's values.

Research by other organisations and individuals may provide valuable information for management. A prospectus will be prepared to encourage involvement of other organisations in priority research areas.

NPWS policy requires all research proposals to be assessed for their likely impact on the environment. Research proposals are subject to procedures relating to the granting of permits, the conduct of research and provision of results.

### **Desired Outcomes**

- Research and monitoring provides information which consolidates or improves existing knowledge of the park and increases understanding of the natural processes and natural and cultural values of the park.
- Research causes minimal environmental damage.
- Monitoring programs are in place to detect any changes in the status of park values.
- Improved management by incorporating the results of research into management decision making.

### **Strategies**

- Undertake or encourage research to provide information about the park's natural and cultural heritage in order to facilitate management.
- Prepare a prospectus as a guide to preferred research projects in the park. Preferred topics will be those of direct relevance to management and will include those topics discussed in other sections of this plan.
- Encourage bird watchers or similar groups to pass on information gathered in the park.
- Liaise with local universities to encourage research in priority projects in the park.

## 7 NPWS MANAGEMENT FACILITIES AND OPERATIONS

Implementation of the management programs identified in this plan requires a system of management trails in addition to that provided by the park road system. Management trails are shown on Map 1. The purpose of management trails is to facilitate the management of fire, weeds and feral animals. Some trails can also assist public safety, for example in search and rescue. Vehicle access to management trails is restricted to essential NPWS management purposes and other essential or emergency purposes authorised by NPWS. These trails are also available for use by walkers.

In addition, some internal tracks remain from former logging operations. They were not intended or promoted for public access. Many are now either untrafficable, in poor condition, not required for ongoing management or are overgrown.

There are three Ministerial roads in the park as shown in Table 5. NPWS will contribute to the management of these roads with the appropriate parties.

**Table 5. Schedule of Ministerial roads.**

<b>Name</b>	<b>Tenure</b>	<b>Length (km)</b>
North Wilson Road	Forestry access	1.9
Bobs Ridge Road	Forestry access	2.4
Hut/Long Flat Creek Roads	Private access	3.3

There are four quarries within the park; Wilson River, North Wilson, Long Flat and Anderson's Road quarries. An assessment of these quarries was undertaken in 2002 (NPWS 2002b). Wilson River quarry has a small amount of gravel stockpiled. Long Flat and Anderson's Road quarries each have approximately 1000m<sup>3</sup> of gravel available. North Wilson quarry has been disused for considerable time and is overgrown with regrowth native vegetation, however it does contain approximately 10,000m<sup>3</sup> of gravel.

These quarries provide a valuable resource for maintaining roads and trails within the park. The Wilson River quarry is located on the main visitor access to Wilson River Picnic Area and this quarry should be closed and rehabilitated once the stockpiled gravel is used. NPWS will prepare a quarry management plan and an environmental assessment prior to extracting gravel from the remaining quarries.

### **Desired Outcomes**

- A safe and effective trail network is maintained for management purposes.
- Management, staffing and facilities that adequately serve the needs of park management with acceptable environmental impact.
- A cooperative relationship is maintained with park neighbours.

## Strategies

- Maintain a strategic network of management trails (see Map 1) to a dry weather four-wheel drive standard. Trails will be signposted to provide direction and gates or bollards installed where necessary to prevent unauthorised access. All other trails will be closed and rehabilitated.
- Negotiate an MOU with Forests NSW and other relevant stakeholders regarding the cooperative maintenance and use of Ministerial Roads.
- Maintain close liaison with park neighbours to deal with matters of mutual concern.
- Close and rehabilitate Wilson River quarry following the removal of the remaining stockpiles of gravel for road maintenance.
- Prepare a quarry management plan for North Wilson, Long Flat and Anderson's Road quarries and undertake an environmental assessment prior to implementing quarry management plans.

## 8 PLAN IMPLEMENTATION

This plan of management establishes a scheme of operations for the park and is part of a system of management developed by the NPWS. The system includes the NPW Act, management policies, established conservation and recreation philosophies, and strategic planning at corporate, branch and regional levels.

Section 81 of the Act requires that this plan of management shall be carried out and given effect to, and that no operations shall be undertaken in relation to the park unless they are in accordance with the plan.

Relative priorities for identified activities are set out in the table below. These priorities are determined in the context of branch and regional strategic planning, and are subject to the availability of necessary staff and funds and to any special requirements of the Director-General or Minister.

Priorities are allocated against each activity as follows:

**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.

The environmental impact of proposed activities will be assessed at all stages in accordance with established environmental assessment procedures. Where impacts are found to be unacceptable, activities will be modified in accordance with the plan policies.

This plan of management does not have a specific term and will stay in force until amended or replaced in accordance with the Act. The plan applies both to the land currently reserved and to any future additions. Where management strategies or works are proposed for additions (or the existing area) that are not consistent with the plan, an amendment to the plan will be required.

### Management Strategies

- Undertake an annual review of progress in implementing this plan of management.
- Undertake an assessment after 5 years of the effectiveness of managing Willi Willi National Park in accordance with this plan, including the degree of success in achieving the plan's objectives.

## Implementation Table

SECTION	ACTION	PRIORITY
<b>3</b>	<b>CONSERVATION OF NATURAL AND CULTURAL HERITAGE</b>	
<b>3.1</b>	<b>Geology and Landform</b>	
3.1.1	Monitor significant geological features to ensure there are no permanent visitor impacts. Access may be restricted to protect sites if necessary.	High
3.1.2	Liaise with neighbours and land use authorities as needed to minimise the impact of adjacent land use on views from the main vantage points in the park.	Low
<b>3.2</b>	<b>Native Plants</b>	
3.2.1	Undertake a vegetation survey of the park to map accurately the distribution, structure and species composition of plant communities.	Medium
3.2.2	Encourage research into the ecological requirements, including fire ecology, of vegetation communities, especially for rare and threatened plant species.	Medium
3.2.3	Introduce a program to monitor the status of the significant plant communities and threatened plant species and to evaluate the success of management programs.	Medium
3.2.4	Implement relevant actions in the Threatened Species Priorities Action Statement.	High
3.2.5	Ensure that management and/or visitor activities do not have a negative impact on threatened or significant plant species.	High
3.2.6	Implement a marker system throughout the road and trail network in the park to avoid damage to threatened or significant plant species from road works or weed control programs.	High
3.2.7	Allow natural regeneration of cleared/logged areas, and where necessary undertake revegetation using locally indigenous species.	Medium
<b>3.3</b>	<b>Native Animals</b>	
3.3.1	Protect the habitat of threatened and biogeographically significant native animals from visitor impacts, pest species and inappropriate fire regimes.	Medium
3.3.2	Continue to record the distribution of threatened and significant native animal species. In particular, undertake targeted surveys for significant species predicted to occur within the park.	Medium
3.3.3	Implement relevant actions in the Threatened Species Priorities Action Statement.	High
3.3.4	Manage the area in accordance with the NPWS Wild Dog Policy as a dingo management area.	High
3.3.5	Opportunistically collect DNA samples from wild dogs/dingoes to enhance knowledge of the dingo population integrity.	Medium
3.3.6	Encourage research into the genetics, movement, population dynamics and distribution of dingoes so as to define core dingo conservation area boundaries.	Medium
3.3.7	Undertake a survey for reptiles during summer.	Medium
3.3.8	Encourage the monitoring of native animals.	Low

<b>3.4</b>	<b>Aboriginal Heritage</b>	
3.4.1	Encourage a cultural heritage assessment of the park, including research into the Aboriginal cultural values associated with the park.	High
3.4.2	Manage Aboriginal heritage in the park in consultation with the Kempsey Local Aboriginal Land Council, Dunghutti Elders Incorporated and other relevant Aboriginal community organisations and individuals.	High
3.4.3	Undertake an archaeological survey and cultural assessment prior to all works with the potential to impact on Aboriginal sites and places.	High
3.4.5	Protect Aboriginal sites, objects, places and culturally significant features from damage by human activity and fire.	High
3.4.6	Do not publicise the location of Aboriginal sites and places except where the agreement of relevant Aboriginal community organisations has been obtained. Prior to any promotion of a site, prepare a conservation study and undertake any management work necessary to protect the site or place.	Medium
3.4.7	Interpret the Aboriginal heritage of the park in consultation with Aboriginal community representatives.	Medium
<b>3.5</b>	<b>Historic Heritage</b>	
3.5.1	Retain fence posts and strainers but remove wire from internal fences surrounding the Banda Banda arboretum.	High
3.5.2	Develop a management plan for Banda Banda arboretum	Low
<b>4</b>	<b>PARK PROTECTION</b>	
<b>4.1</b>	<b>Soil Erosion</b>	
4.1.1	Design and undertake all works in a manner that minimises soil erosion.	High
4.1.2	Maintain adequate drainage on roads and trails in the park. Where necessary restrict vehicle usage on roads and trails that are prone to higher rates of erosion.	High
4.1.3	Temporarily restrict access to some roads and trails during and immediately after prolonged periods of rain, as required.	Medium
<b>4.2</b>	<b>Water Quality and Catchment Management</b>	
4.2.1	Design and undertake all works in a manner that minimises water pollution.	High
<b>4.3</b>	<b>Pest Species</b>	
4.3.1	Carry out weed and pest animal control in accordance with Mid North Coast Region Pest Management Strategy. Priority will be given to exotic conifers, lantana and wild dogs.	High
4.3.2	Develop and implement cooperative and integrated weed and pest animal control strategies with neighbours and the Mid Coast Livestock Health and Pest Authority.	High
4.3.3	Encourage maintenance of effective fencing of boundaries with grazing properties to prevent domestic stock from entering the park. Provide fencing assistance (through fencing agreements) where possible and appropriate to exclude stock.	Medium

4.3.4	In accordance with the approved Wild Dog Management Plan (DPI 2008), target management of wild dogs to the north east of the park (eastern end of McCoys Trail to east of Jacobs Mountain) where the likelihood both of impacts on neighbours' livestock and the hybrid risk to dingoes is greatest.	Medium
4.3.5	Continue research into dingoes including dingo DNA sampling within the park to determine areas of pure dingoes and core dingo habitat.	Medium
4.3.6	Implement management techniques to reduce the spread of weeds when using vehicles and machinery.	Medium
4.3.7	Monitor and where possible map the abundance and distribution of introduced plants and pest animals.	Medium
4.3.8	Implement weed and pest animal actions from threat abatement plans in the Threatened Species Priorities Action Statement.	High
<b>4.4</b>	<b>Fire Management</b>	
4.4.1	Regularly review and update the Reserve Fire Management Strategy for the park.	High
4.4.2	Ensure the locations of known populations of threatened plant and animal species and locations where those species are predicted to occur are clearly identified in future Fire Management Strategy documentation.	High
4.4.3	Use prescribed fire (where possible) to achieve a variety of fire regimes that maintain fire thresholds for each vegetation community in accordance with the Fire Management Strategy.	Medium
4.4.4	Plan to exclude fire from all rainforest areas within the park, the Banda Banda arboretum, and habitats of threatened species known to be susceptible to fire.	High
4.4.5	Avoid the use of heavy machinery for fire suppression other than where appropriate on existing fire management trails, or on old timber snigging trails which remain clearly delineated. No new trails are to be constructed.	High
4.4.6	No new remote helipads will be constructed. Ensure that suitable existing sites are clearly documented in the rewritten Fire Management Strategy.	High
4.4.7	Fire fighting retardants will not be used in rainforests, World Heritage Areas, and in permanent soaks, creeks and rivers. Written approval from the Regional Manager must be given before fire fighting retardants are used elsewhere within the park.	Medium
4.4.8	Rehabilitate areas disturbed by fire suppression as soon as practical after the fire.	Medium
4.4.9	Encourage research into the ecological effects of fire in the park, particularly the fire response of significant plant species and the fire requirements of the plant and animal communities.	Medium
4.4.10	Continue to participate actively in the Lower North Coast and Manning Bush Fire Management Committees. Maintain close contact and cooperation with neighbours, Council and Rural Fire Service (RFS) officers and RFS brigades.	High
4.4.11	Establish cooperative relations with neighbours and carry out fuel management for mutual protection.	Medium

4.4.12	Undertake fuel reduction programs, trail maintenance, research and monitoring programs in accordance with NPWS policies and the Reserve Fire Management Strategy.	High
<b>4.5</b>	<b>Dieback</b>	
4.5.1	Support the Bell Miner Associated Dieback Working Group by monitoring dieback in the park and trialing relevant programs.	Medium
4.5.2	Determine the presence/absence of <i>Phytophthora cinnamomi</i> within the park and monitor the possible spread within the park.	Medium
4.5.3	If required, close roads and management trails to quarantine areas possibly affected by <i>P. cinnamomi</i> .	Medium
<b>5</b>	<b>VISITOR OPPORTUNITIES AND EDUCATION</b>	
<b>5.1</b>	<b>Information Provision</b>	
5.1.1	Maintain visitor facilities only on the periphery of the park.	High
5.1.2	Produce an interpretation plan for the park.	Medium
5.1.3	Emphasise the following themes in promotion and interpretation programs: world heritage; wilderness; rainforest - forest type diversity; threatened species; red cedar history; significance to local Aboriginal people; and State Forest flora reserve history.	Medium
5.1.4	Provide additional directional signposting within the park at key locations.	Medium
5.1.5	Place orientation/interpretive displays and signs at Wilson River Picnic Area and Banda Banda Car Park.	Medium
5.1.6	Support and assist educational use of appropriate areas of the park by schools, community groups and individuals through provision of information and the NPWS <i>Discovery</i> program.	Medium
<b>5.2</b>	<b>Recreation Opportunities</b>	
5.2.1	Provide public vehicle access in accordance with Map 1. Access may be restricted to prevent damage during periods of wet weather and/or to ensure public safety.	Medium
5.2.2	Install signage, gates and bollards as necessary to prevent public vehicle access to the management trail system and the Willi Willi Wilderness Area.	High
5.2.3	Provide a vehicle turn-around and small parking area at the junction of Banda Road and Loop Trail, outside of the wilderness area.	Medium
5.2.4	Maintain existing facilities at Wilson River Picnic Area and Glade Picnic Area.	Medium
5.2.5	Encourage visitors to use fuel stoves or bring their own firewood into the park.	Medium
5.2.6	Maintain the Waterfall, Botanic and Palm Grove walking tracks at Wilson River Picnic Area.	High
5.2.7	Continue to allow self-reliant bush walking throughout the park.	Medium
5.2.8	Allow minimal impact self-reliant pack or bush camping throughout the park at locations more than 500m from roads, walking tracks and visitor facilities. Place further restrictions on pack camping if needed to minimise impacts.	Medium
5.2.9	Permit cycling on park roads outside of the wilderness area. Do not allow cycling on management trails	Medium
5.2.10	Do not allow horse riding within the park.	High

5.2.11	Assess commercial and group activity applications with respect to impacts on park values. Activities deemed to have a significant impact will not be permitted.	Medium
5.2.12	Group sizes will be limited to up to 10 persons within the Willi Willi Wilderness Area, and up to 20 persons in those areas of the park outside of the Willi Willi Wilderness Area. Visitor group size limits outside the wilderness may be varied if the prior written consent from NPWS is obtained.	Medium
5.2.13	License all commercial operators using the park and apply conditions as necessary to minimise impacts.	High
5.2.14	Monitor the impacts of visitor use and if necessary close areas permanently or temporarily or otherwise restrict access or use if there is unacceptable damage to natural or cultural values or conflict with other users, or if use may be increasing the risk of spread of <i>Phytophthora cinnamomi</i> .	High
<b>6</b>	<b>RESEARCH AND MONITORING</b>	
6.1	Undertake or encourage research to provide information about the park's natural and cultural heritage and human use in order to facilitate management.	Medium
6.2	Prepare a prospectus as a guide to preferred research projects in the park. Preferred topics will be those of direct relevance to management and will include those topics discussed in other sections of this plan.	Low
6.3	Encourage bird watchers or similar groups to pass on information gathered in the park.	Low
6.4	Liaise with local universities to encourage research in priority projects in the park.	Low
<b>7</b>	<b>NPWS MANAGEMENT FACILITIES AND OPERATIONS</b>	
7.1	Maintain a strategic network of management trails (see Map 1) to a dry weather four-wheel drive standard. Trails will be signposted to provide direction and gates or bollards installed where necessary to prevent unauthorised access. All other trails will be closed and rehabilitated	High
7.2	Negotiate an MOU with Forests NSW and other relevant stakeholders regarding the cooperative maintenance and use of Ministerial Roads.	High
7.3	Maintain close liaison with park neighbours to deal with matters of mutual concern.	Medium
7.4	Close and rehabilitate Wilson River quarry following the removal of the remaining stockpiles of gravel for road maintenance.	High
7.5	Prepare a quarry management plan for North Wilson, Long Flat and Anderson's Road quarries and undertake an environmental assessment prior to implementing quarry management plans.	Medium
<b>8</b>	<b>PLAN IMPLEMENTATION</b>	
8.1	Undertake an annual review of progress in implementing this plan of management.	High
8.2	Undertake an assessment after 5 years of the effectiveness of managing Willi Willi National Park in accordance with this plan, including the degree of success in achieving the plan's objectives.	Medium

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