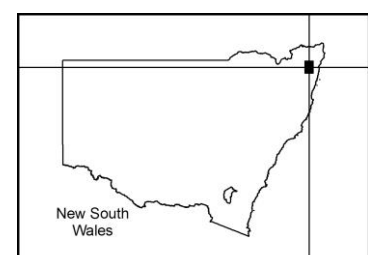


Plan of Management



Southern Richmond Range Parks

Incorporating Fortis Creek and Mount Pikapene National Parks;
Banyabba, Chapmans Peak and Mount Neville Nature Reserves;
and Banyabba, Corymbia, Gurranang, Kooyong, Lawrence Road,
Mount Pikapene and Wombat Creek State Conservation Areas



This plan of management was adopted by the Minister for Environment on 26 April 2016.

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Acknowledgments

This plan of management was prepared by staff in the North Coast and Northern Rivers regions of the NSW National Parks and Wildlife Service (NPWS), part of the Office of Environment and Heritage. NPWS would like to thank those people who took the time to make a submission on the draft version of this plan exhibited in 2012 and on an earlier draft of the plan exhibited in 2005. NPWS acknowledges this group of parks is in the Bundjalung Aboriginal Nation, specifically in the traditional Country of the Bandjalang and Western Bundjalung peoples.

For additional information or any inquiries about these parks, or this plan of management, contact the NPWS Clarence North Area Office, PO Box 361, Grafton NSW, 2460 or by telephone on (02) 6641 1500.

Front cover: Banyabba Wilderness from Dilkoon Trail and close-up of *Grevillea banyabba*.
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Foreword

The Southern Richmond Range parks comprise 12 separate parks and reserves, which were reserved between 1969 and 2007 and together protect 38,906 hectares. They are located along or in the vicinity of the southern section of the Richmond Range in the hinterland of the NSW north coast.

These parks protect a wealth of plants and animals and form part of an extensive ecological corridor which provides important habitat for 20 threatened plants and 38 threatened animals. Mount Neville Nature Reserve is listed on the State Heritage Register due to its high conservation value old-growth forest. Most of Banyabba Nature Reserve and Fortis Creek National Park are declared wilderness.

The parks are part of a landscape of cultural importance to the Bundjalung peoples. They protect culturally important Aboriginal sites and places, including rock art shelters. Native title rights of the Bandjalang People over part of the parks have been legally recognised by the Federal Court. The remainder of the parks lie within the active native title claim of the Western Bundjalung People.

The NSW *National Parks and Wildlife Act 1974* requires that a plan of management be prepared for each park, and allows for a single plan to cover a group of parks.

A draft plan of management was exhibited from 23 November 2012 to 25 February 2013, and was informed by the submissions received on a previous draft exhibited in 2005. The submissions received on the later draft were carefully considered before adopting this plan of management.

The plan of management contains a number of actions to protect our natural environment. These include strategies to assist the recovery of threatened species and communities, such as the implementation of relevant actions in the *Saving our Species* program, and to control pest species in accordance with the NPWS regional pest management strategy.

The plan of management also fosters partnerships with Aboriginal people. This plan of management advocates continuing consultation with the local Aboriginal land councils, Native Title claimants and other relevant Aboriginal organisations about management of the planning area.

This plan of management establishes the scheme of operations for Fortis Creek and Mount Pikapene national parks; Banyabba, Chapmans Peak and Mount Neville nature reserves; and Banyabba, Corymbia, Gurranang, Kooyong, Lawrence Road, Mount Pikapene and Wombat Creek state conservation areas. In accordance with section 73B of the National Parks and Wildlife Act, this plan of management is hereby adopted.



Mark Speakman
Minister for the Environment

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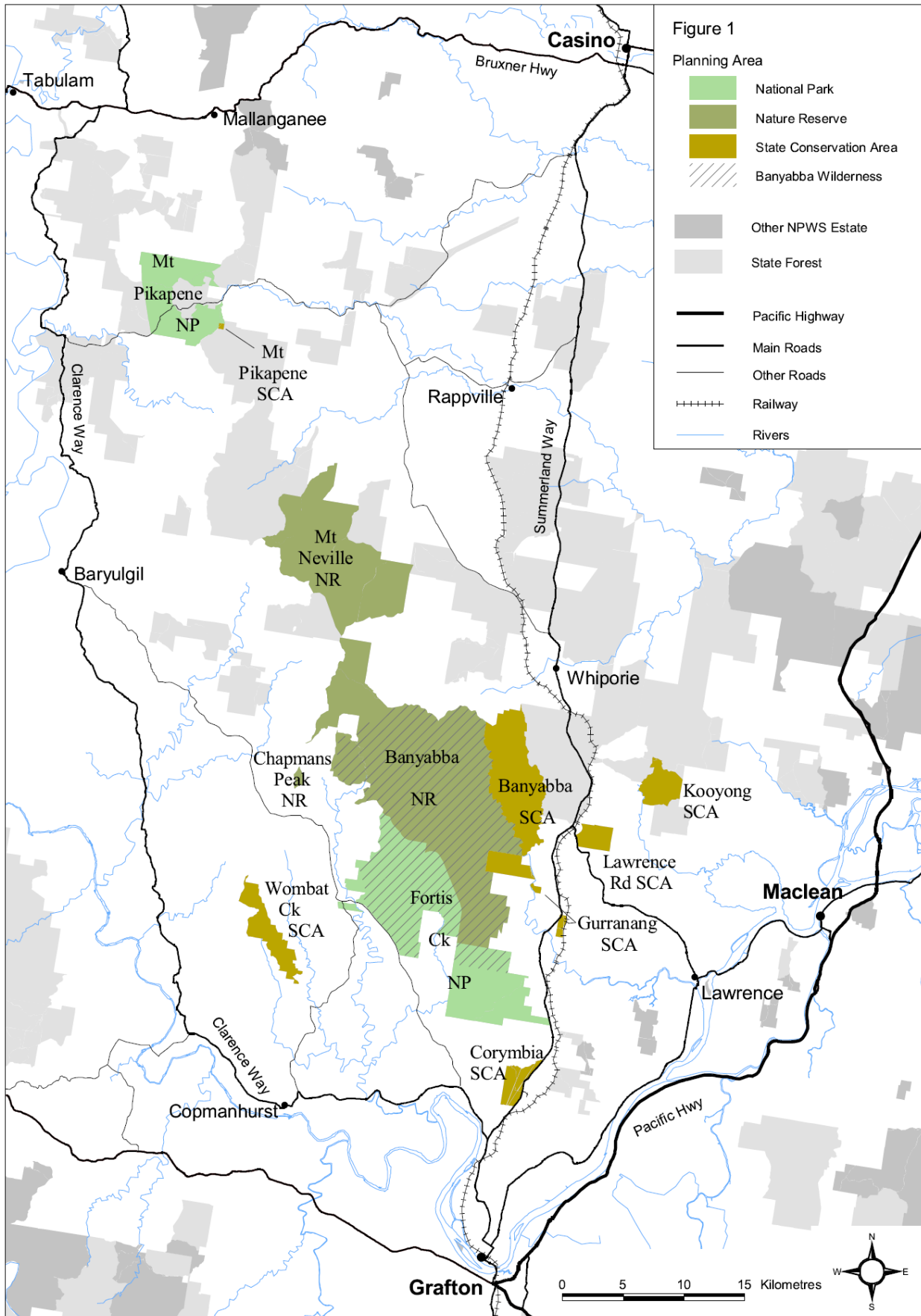
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Figure 1: Locality of the planning area



1 Introduction

1.1 Location, reservation and regional setting

Features	Description																												
Location	<p>The Southern Richmond Range national parks, nature reserves and state conservation areas (referred to as the 'planning area' in this plan) are located along and in the vicinity of the southern section of the Richmond Range in the hinterland of the NSW north coast. The planning area is located between Grafton and Casino, with most of the parks west of the Summerland Way (see Figure 1).</p> <p>The parks, reserves and state conservation areas covered by this plan have been grouped under the one plan due to their close biogeographical association. Fortis Creek National Park, Mount Neville Nature Reserve, Banyabba Nature Reserve and Banyabba State Conservation Area form the large central portion of the planning area (see Figures 1, 2 and 3).</p> <p>Corymbia State Conservation Area (see inset Figure 3) forms the southernmost extent of the planning area, located approximately 12 kilometres north of Grafton. Mount Pikapene National Park and State Conservation Area (see Figure 4) are the northernmost parks in the planning area, located approximately 40 kilometres south-west of Casino. Other outlying reserves include Chapmans Peak Nature Reserve and Wombat Creek State Conservation Area in the west; and Kooyong, Lawrence Road and Gurrangang state conservation areas in the east (see Figure 3).</p>																												
Area	<p>The planning area covers an area of 38,906 hectares as detailed below.</p> <table border="1"> <thead> <tr> <th>Park name</th> <th>Area (hectares)</th> </tr> </thead> <tbody> <tr> <td>Banyabba Nature Reserve</td> <td>15,210</td> </tr> <tr> <td>Banyabba State Conservation Area</td> <td>3,566</td> </tr> <tr> <td>Chapmans Peak Nature Reserve</td> <td>72</td> </tr> <tr> <td>Corymbia State Conservation Area</td> <td>495</td> </tr> <tr> <td>Fortis Creek National Park</td> <td>7,960</td> </tr> <tr> <td>Gurrangang State Conservation Area</td> <td>111</td> </tr> <tr> <td>Kooyong State Conservation Area</td> <td>753</td> </tr> <tr> <td>Lawrence Road State Conservation Area</td> <td>440</td> </tr> <tr> <td>Mount Neville Nature Reserve</td> <td>6,575</td> </tr> <tr> <td>Mount Pikapene National Park</td> <td>2,630</td> </tr> <tr> <td>Mount Pikapene State Conservation Area</td> <td>17</td> </tr> <tr> <td>Wombat Creek State Conservation Area</td> <td>1,077</td> </tr> <tr> <td>TOTAL</td> <td>38,906</td> </tr> </tbody> </table> <p>The majority of these parks are bounded by other protected areas, state forest or private land. Chapmans Peak Nature Reserve, and Corymbia and Wombat Creek state conservation areas are surrounded by private land.</p> <p>The southern section of Gurrangang State Conservation Area spans the Summerland Way and is bounded by the North Coast Railway on the east near</p>	Park name	Area (hectares)	Banyabba Nature Reserve	15,210	Banyabba State Conservation Area	3,566	Chapmans Peak Nature Reserve	72	Corymbia State Conservation Area	495	Fortis Creek National Park	7,960	Gurrangang State Conservation Area	111	Kooyong State Conservation Area	753	Lawrence Road State Conservation Area	440	Mount Neville Nature Reserve	6,575	Mount Pikapene National Park	2,630	Mount Pikapene State Conservation Area	17	Wombat Creek State Conservation Area	1,077	TOTAL	38,906
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Features	Description
	<p>Bullock Swamp Creek and to the south by a camping reserve associated with a travelling stock route. Lawrence Road State Conservation Area is surrounded by private property on three sides and adjoins the original corridor of the North Coast Railway and Pringles Way along its western edge.</p> <p>The planning area also includes several roads that are vested in the Minister under Part 11 of the <i>National Parks and Wildlife Act 1974</i> (NPW Act) to ensure continued access to neighbouring land. These roads do not form part of the reserved area of the parks but their management is subject to this plan, the NPW Regulation and the requirements of the <i>Environmental Planning and Assessment Act 1979</i> (EPA Act) (see Section 5.1).</p> <p>The Upper North East Regional Forest Agreement covers the planning area and provided for major additions to the park system, including the establishment of Mount Pikapene National Park and the addition of significant areas to Banyabba and Mount Neville nature reserves.</p>
<p>Reservation dates and previous tenure</p>	<p>Banyabba Nature Reserve was initially reserved in 1969 with additions reserved in 1999. These additions were previously part of the Mount Marsh State Forest and vacant Crown land surrounding Mount Lardner.</p> <p>Banyabba State Conservation Area was reserved on 1 January 2003. Most was originally part of Banyabba State Forest. The southern section was formerly freehold land which, following its purchase by the NSW Government, was reserved in 2005.</p> <p>Chapmans Peak Nature Reserve was reserved in 1999 over former vacant Crown land.</p> <p>Corymbia State Conservation Area was reserved in January 2003. The area had previously been part of Fortis Creek State Forest. Before its dedication as state forest in 1989, it had been reserved since 1895 as a refuge in time of flood.</p> <p>Fortis Creek National Park was reserved in January 1997. The area had previously been part of Fortis Creek State Forest. A former inholding of approximately 122 hectares centred about the area known as Morgans Camp, including the lease over the remaining portion of Fortis Creek State Forest, was purchased by NPWS in 1999 and reserved as part of the park in January 2003.</p> <p>Gurranang State Conservation Area was reserved in January 2003. Before January 2003, these areas formed Gurranang Crown Reserve, reserved in December 1999 for public recreation, conservation, and mineral and petroleum exploration. Prior to this, the northern section was reserved for quarrying. A plan for the proposed village of Gurranang, which would have covered most of the southern portion, was proclaimed in 1907 but the land was never released for the settlement. A number of public road reserves were included in this plan.</p> <p>Kooyong State Conservation Area was reserved in January 2003. It had formerly been part of Gibberagee State Forest, most of it reserved under the <i>Forestry Act 1916</i> as Needlebark Flora Reserve.</p> <p>Lawrence Road State Conservation Area was reserved in January 2003. It was previously Lawrence Road Crown Reserve, reserved in December 1999 for public recreation, conservation, and mineral and petroleum exploration. The original spelling of the name was Laurence Road State Conservation Area. This was changed by gazette notice in 2007 to the accepted spelling of this locality's name.</p> <p>Mount Neville Nature Reserve was originally reserved in 1987 with additions in 1999 and 2007. The reserve was previously part of Mount Marsh and Mount Belmore state forests, private property and vacant Crown land.</p>

Features	Description
	<p>Mount Pikapene National Park was reserved in 1999 and was formerly part of Mount Pikapene State Forest.</p> <p>Mount Pikapene State Conservation Area was reserved in 2007 and was formerly freehold land.</p> <p>Wombat Creek State Conservation Area was reserved in January 2003. It was previously Wombat Creek Crown Reserve, reserved in December 1999 for public recreation, conservation and mineral and petroleum exploration.</p>
Regional context	
Biogeographic region	<p>The planning area was mapped by Thackway and Cresswell (1995) as being part of the NSW North Coast Bioregion and the area is still considered part of this bioregion for the purposes of the <i>Threatened Species Conservation Act 1995</i> (TSC Act). However, due to subsequent revisions of the Interim Biogeographic Regionalisation for Australia, it is currently considered part of the South Eastern Queensland Bioregion. Biologically, it shares many species with other reserves on the Kangaroo Creek Sandstone Belt, such as Sherwood and Chambigne nature reserves in the south.</p> <p>The planning area is linked via a corridor of natural vegetation along the Richmond Range to protected areas further north (e.g. Richmond Range and Toonumbar national parks) and then onwards to the McPherson Range on the NSW–Queensland border (Scotts 2003).</p>
Surrounding land use	<p>The area surrounding the planning area is a mixture of state forest and private land. Surrounding land use is predominantly forestry (both public and private) and cattle grazing.</p>
Other authorities	<p>The planning area falls within the administrative areas of:</p> <ul style="list-style-type: none"> • the Baryulgil, Bogal, Casino, Grafton-Ngerrie, Jana Ngalee, Jubullum and Yaegl local Aboriginal land councils • North Coast Local Land Services • the Clarence Valley and Richmond Valley councils.

1.2 Statement of significance

The planning area is significant because of its natural and cultural values.

Landscape and catchment values

The planning area is a largely unmodified landscape, with several high points that provide backdrops to the surrounding cleared lowlands. Banyabba Nature Reserve is listed on the Australian Heritage Database in recognition of its outstanding natural catchment and river system values (DoE 2015a).

Geological values

The planning area protects diverse landforms, from rocky mountainous escarpment to low-elevation undulating terrain. The planning area includes the majority of outcrops associated with the Kangaroo Creek Sandstone Belt located north of the Clarence River, plus outcrops associated with the Walloon Coal Measures.

Biological values

The planning area protects a wealth of plant and animal species, and is particularly renowned for its plant diversity with many interesting disjunct and endemic species. Twenty plants and 38 animals listed as threatened under the TSC Act, along with many other significant species, have been recorded within the planning area and others are predicted to occur. A portion of the rainforest communities occurring within the planning area is listed under the TSC Act as an endangered ecological community.

The planning area is largely unmodified with large areas of ecologically mature forest providing important habitat. Maternal camps of two species of flying-fox occur in the planning area as well as an important bentwing-bat roost site in Mount Neville Nature Reserve. Mount Neville Nature Reserve is listed on the State Heritage Register due to its high conservation value old-growth forest (OEH 2015).

The planning area is part of an extensive ecological corridor along the southern section of the Richmond Range. This connectivity across the landscape facilitates the movement of native animals and the exchange of plant genetic material across the landscape, conserving the natural heritage values in the region and increasing their long-term viability.

Aboriginal heritage values

The planning area is part of a landscape of cultural importance to the people of the Bundjalung Nation. It protects culturally important Aboriginal sites and places, including a rock art shelter listed on the Australian Heritage Database (DoE 2015b). The Bundjalung People's native title rights have been recognised for several parks within the planning area. The other parks in the planning area fall under the active native title claim of the Western Bundjalung People.

Wilderness values

The planning area contains vast and rugged forested landscapes that provide opportunities for solitude and self-reliant recreation. These values have contributed to declaration of the Banyabba Wilderness in 2002 (NPWS 2001), which covers the majority of Banyabba Nature Reserve and Fortis Creek National Park (see Figures 1 and 3).

2 Management context

2.1 Legislative and policy framework

The management of national parks, nature reserves and state conservation areas in New South Wales is in accordance with a legislative and policy framework, primarily the NPW Act, the TSC Act and the policies of the National Parks and Wildlife Service (NPWS). Section 72AA of the NPW Act lists the matters to be considered in the preparation of a plan of management. The policies arise from 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 EPA Act may require the assessment and mitigation of 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 matters of national environmental significance, such as threatened species listed under that Act. The NSW *Heritage Act 1977* may apply to the excavation of known archaeological sites or sites with the potential to contain historical archaeological relics.

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 the planning area except in accordance with the plan.

The plan will also apply to any future additions to the parks, reserves and state conservation areas that form the planning area. Where management strategies or works that are not consistent with the plan are proposed for the planning area or any additions, an amendment to the plan will be required.

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, inspiration and sustainable visitor or tourist use and enjoyment.

Under the NPW 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 or tourist 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
- provide for appropriate research and monitoring.

The primary purpose of national parks is to conserve nature and cultural heritage. Opportunities are provided for appropriate visitor use in a manner that does not damage conservation values.

Nature reserves

Nature reserves are reserved under the NPW Act to protect and conserve areas containing outstanding, unique or representative ecosystems, species, communities or natural phenomena.

Under the NPW Act (section 30J), nature reserves are managed to:

- conserve biodiversity, maintain ecosystem functions, and protect geological and geomorphological features and natural phenomena
- conserve places, objects, features and landscapes of cultural value
- promote public appreciation, enjoyment and understanding of the reserve's natural and cultural values
- provide for appropriate research and monitoring.

The primary purpose of nature reserves is to conserve nature. Nature reserves differ from national parks in that they do not have the provision of visitor use as a management purpose or principle.

State conservation areas

State conservation areas are reserved under the NPW Act to protect and conserve areas that:

- contain significant or representative ecosystems, landforms or natural phenomena or places of cultural significance
- are capable of providing opportunities for sustainable visitor or tourist use and enjoyment, the sustainable use of buildings and structures, or research
- are capable of providing opportunities for uses permitted under other provisions of the NPW Act.

Under the NPW Act (section 30G), state conservation areas are managed to:

- conserve biodiversity, maintain ecosystem functions, protect natural phenomena and maintain natural landscapes
- conserve places, objects and features of cultural value
- provide for the undertaking of uses permitted under other provisions of the NPW Act (including uses permitted under section 47J such as mineral exploration and mining), having regard to the conservation of the natural and cultural values of the state conservation area
- provide for sustainable visitor or tourist use and enjoyment that is compatible with conservation of the area's natural and cultural values and with uses permitted in the area
- provide for sustainable use (including adaptive reuse) of any buildings or structures or modified natural areas having regard to conservation of the area's natural and cultural values and with other uses permitted in the area
- provide for appropriate research and monitoring.

Land is reserved as a state conservation area primarily where mineral values preclude reservation as a national park or nature reserve. The NPW Act requires a review of the classification of state conservation areas every 5 years in consultation with the Minister administering the *Mining Act 1992*. Reviews were conducted in 2008 and 2013.

In the long term, subject to the outcomes of future 5-yearly reviews, it is intended that the state conservation areas in the Southern Richmond Range Parks will become nature reserves. In the meantime their management will also be guided by the management principles for nature reserves where possible.

State Heritage Register

In 2000, Mount Neville Nature Reserve was included on the State Heritage Register as part of the listing of High Conservation Value Old Growth Forest (OEH 2015). Under the NSW Heritage Act, all items listed on the State Heritage Register must be maintained to at least the minimum standards required under that Act. NPWS policy requires all items listed on the State Heritage Register to have a conservation management plan and be maintained in accordance with best practice management principles. This plan of management and its implementation meet these requirements (see Section 3.2).

Wilderness

The majority of Banyabba Nature Reserve and Fortis Creek National Park (approximately 18,000 hectares) form the Banyabba Wilderness Area declared under the *Wilderness Act 1987*. The Banyabba Wilderness was declared in September 2002. Wilderness areas are large areas of land that, together with their native plant and animal communities, are in an essentially natural state or are capable of being restored to such a state.

Under the Wilderness Act (section 9) wilderness areas are managed to:

- restore (if applicable) and to protect the unmodified state of the area and its plant and animal communities
- preserve the capacity of the area to evolve in the absence of significant human interference
- permit opportunities for solitude and appropriate self-reliant recreation (whether of a commercial nature or not).

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

2.3 Aboriginal joint management

As traditional custodians of the land, Aboriginal people have a unique role to care for and manage Country. This role overlaps with NPWS's legislative responsibilities to manage land for conservation. Partnerships recognise and capitalise on these mutual interests and responsibilities, including recognising that:

- All parks are part of Aboriginal people's Country and are places where Aboriginal people can care for their Country and access their Country and its resources. Given the history of dispossession in New South Wales, public lands and parks play an important role in the maintenance of Aboriginal culture and connection to Country. Meaningful engagement with Aboriginal communities on the management and use of parks is essential to ensure that their needs in relation to their Country are met.
- Aboriginal communities obtain cultural, social and economic benefits through being involved in park management.
- NPWS in partnership with the relevant Aboriginal communities are better able to protect and interpret cultural heritage and to apply Aboriginal knowledge to land management and the conservation of cultural and natural values.
- Visitors to parks have an enriched experience through interaction with Aboriginal people and an understanding of Aboriginal cultural values.
- Access to land managed by NPWS provides particular opportunities for Aboriginal people to sustain spiritual and cultural activities.

The planning area is currently (2016) subject to two native title claims: one by the Bandjalang People which was determined in December 2013; the other by the Western Bundjalung People, which is active but is yet to be determined (see Section 3.4).

During the life of this plan, it is likely that some form of agreement (such as a memorandum of understanding or an Indigenous Land Use Agreement) will be developed to provide for those parts of the planning area subject to the native title claims to be jointly managed by the NPWS and the relevant Aboriginal community.

2.4 Specific management directions

In addition to the general principles outlined above, the following specific management directions apply to the management of the planning area:

- provide for meaningful involvement of relevant native title holders in all aspects of the planning area's management
- recognise and protect the Aboriginal values associated with the planning area in cooperation with representatives of the Bundjalung Nation
- conserve plant species and communities representative of the Kangaroo Creek Sandstone and Walloon Coal Measures geological formations, with specific emphasis on those species endemic to the Kangaroo Creek Sandstone geology
- reduce the impacts of threatening processes, such as inappropriate fire regimes, weed and pest animal invasion, and inappropriate recreational pursuits such as trail bike riding on management trails
- promote the values of the planning area to visitors, neighbours and other stakeholders.

3 Values

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

3.1 Geology, landscape and hydrology

The planning area predominantly lies along the southern end of the Richmond Range, forming the watershed between the Clarence River catchment to the west and the Richmond River catchment to the east.

The planning area consists of diverse landforms ranging from rocky mountainous escarpments to low-elevation undulating terrain. Elevation ranges from around 10 metres in Gurrang State Conservation Area to 557 metres at the summit of Mount Neville in Mount Neville Nature Reserve.

The higher peaks and rocky escarpments of the planning area are prominent local topographic features. Some of these vantage points provide opportunities to view the Clarence and Richmond valleys and adjacent ranges and slopes, giving the viewer an appreciation of the general landform of the area.

The planning area is dominated by Kangaroo Creek Sandstone of Upper Jurassic Cretaceous origin (135–180 million years ago), which forms part of the Clarence–Moreton Basin. This is typically well-sorted quartz-dominated sandstone which is often iron-rich. This sandstone geology is characterised by unusual caves and rocky outcrops similar to those formed in the Hawkesbury Sandstone of the Sydney Basin (McElroy 1962, 1969).

The slightly younger and more erodible Grafton Formation (composed of lithic sandstones, siltstone and claystone) overlies the Kangaroo Creek Sandstone in the south-east corner of Fortis Creek National Park, along the eastern edges of Banyabba Nature Reserve and Banyabba State Conservation Area, and throughout Gurrang State Conservation Area. Lawrence Road, Kooyong and Corymbia state conservation areas all feature areas of Grafton Formation as well as Kangaroo Creek Sandstone. In contrast, Wombat Creek State Conservation Area is comprised entirely of Kangaroo Creek Sandstone geology.

The Walloon Coal Measures (medium- to fine-grained, soft, grey lithic sandstone, siltstone and shale with bituminous coal seams) of Jurassic origin (180 million years ago) dominate Mount Pikapene National Park. The cap of Mount Pikapene itself is coarse sandstone. The Walloon Coal Measures also form outcrops in the north-west section of Fortis Creek National Park and in the north of Banyabba Nature Reserve.

Lithic feldspathic sandstone occurs in the eastern part of Mount Neville Nature Reserve. Mount Neville itself is a volcanic plug comprising a Tertiary porphyritic trachyte intrusion, while a basalt volcanic flow is situated on the western margin of the reserve and in Four Mile Creek. Alluvial Quaternary sediments occupy the broad flats of Cabbage Tree Creek and Six Mile Swamp Creek in this reserve.

Soils in the planning area mainly consist of infertile shallow loams (largely derived from the Kangaroo Creek Sandstone) on the elevated areas of the Southern Richmond Range, and poor draining, low-nutrient yellow and red textured soils on most of the lower lying areas. The feldspar-rich sandstones, such as those in the eastern part of Mount Neville Nature Reserve, weather to form a clay-rich earth with greater soil moisture retention capabilities. Areas of basalt are characterised by structured clays, krasnozems and chocolate soils. A large area of alluvial

fill occurs along Cabbage Tree Creek within Mount Neville Nature Reserve (NPWS 1984; SFNSW 1995).

The planning area contains some of the headwaters of the Clarence and Richmond river systems. The large tracts of forested land generally provide high quality water to these rivers. Banyabba Nature Reserve was listed on the Register of the National Estate in 1978 (now archived in the Australian Heritage Database) for its outstanding natural catchment and river system values (DoE 2015a). The reserve consists of a series of largely unmodified, rugged sandstone ridges and valleys which protect the headwaters of Sportsmans Creek, Banyabba Creek and Rocky Creek.

Issues

The sandstone-derived soils that dominate the planning area tend to be infertile, poorly structured and highly susceptible to erosion. Past land-use practices such as clearing for pasture and cattle grazing have contributed to the formation of extensive erosion gullies in some areas. For example, significant erosion has occurred in Cabbage Tree Creek and Six Mile Swamp Creek within Mount Neville Nature Reserve. Management action will be required to prevent further access of stock to these areas (see Section 4.1).

Given the fragile nature of these sandstone-derived soils, use of the network of management trails in the planning area needs to be carefully managed to ensure minimal erosion and subsequent sedimentation of local waterways. Where possible, management needs to consider the use of slashing and other techniques in preference to road maintenance techniques which disturb the soil surface or increase the potential for erosion (see Section 5.1).

Given the erodibility of these soils, the use of the majority of the trail system for recreational purposes such as four-wheel drive touring and trail bike riding may cause unsustainable erosion (see Sections 3.6 and 5.1).

It is possible that high-intensity wildfire has increased erosion in the planning area by reducing the protective vegetation cover on fragile soils. Management will focus on promoting a more natural fire regime to minimise soil loss in the planning area (see Section 4.2).

Banyabba Nature Reserve is recognised for its role in protecting catchment and river system values. NPWS management operations are carried out in accordance with best practice and sediment control works, as necessary to protect hydrological systems.

Desired outcomes

- Significant geological and geomorphological features are protected, in particular the escarpments.
- Hydrological systems are protected, and rehabilitation and natural regeneration encouraged.
- Areas disturbed by previous land uses, such as cattle grazing, are rehabilitated where practicable.
- Human-induced soil erosion in the park is minimised.

Management response

3.1.1 Manage pest species, fire, roads and trails and areas of past disturbance to minimise erosion and maintain/encourage protective vegetation cover (see Sections 4.1, 4.2 and 5.1).

3.2 Native plants

Given the former tenure of the majority of the planning area as state forest, the area has experienced some degree of logging activity. However, the rugged nature of the terrain and the relatively low production value of the forest resulted in many areas remaining relatively

undisturbed. In particular, Banyabba Nature Reserve and Mount Neville Nature Reserve contain examples of old-growth forest of several ecosystem types. In 2000 Mount Neville Nature Reserve was included on the State Heritage Register as part of the listing of High Conservation Old Growth Forest (OEH 2015).

A number of vegetation surveys have been undertaken in the planning area since the 1970s. The planning area contains a large, relatively undisturbed area of vegetation associated with sandstone geology, which is not well represented in conservation areas in northern New South Wales (NPWS 1995a). The vegetation, soils and native animal assemblages of the planning area contain similarities to NPWS estate on sandstone geology to the north-west of Sydney, over 800 kilometres to the south (Coles 1980).

The variable topography, aspect, geology and altitude of the planning area combine to support a diverse range of vegetation, including dry sclerophyll, wet sclerophyll and rainforest communities.

Dry sclerophyll forests dominate the planning area and typically occupy ridges and relatively exposed slopes. Dominant canopy species include coastal blackbutt (*Eucalyptus pilularis*), Bailey's stringybark (*E. baileyana*), needlebark stringybark (*E. planchoniana*), forest red gum (*E. tereticornis*), grey ironbark (*E. siderophloia*), grey gum (*E. propinqua*), spotted gum (*Corymbia variegata*), brown bloodwood (*C. trachyphloia*), pink bloodwood (*C. intermedia*), large-leaved spotted gum (*C. henryi*) and rough-barked apple (*Angophora woodsiana*) (SFNSW 1995; NRAC 1994).

Wet sclerophyll forests are restricted to sheltered locations on the south-facing slopes and creek lines. Dominant canopy species include brush box (*Lophostemon confertus*), turpentine (*Syncarpia glomulifera*) and tallowwood (*E. microcorys*). Wet sclerophyll forest associations of spotted gum and grey gum occur in Mount Pikapene National Park.

Dry rainforest occurs on the slopes of Mount Pikapene National Park, on clay-loam soils derived from the sedimentary Walloon Coal Measures. This dry rainforest is of a yellow tulipwood – hoop pine alliance (*Drypetes australasica* – *Araucaria cunninghamii*) and a teak – hoop pine sub-alliance (*Flindersia* spp. – *A. cunninghamii*) (Floyd 1990). Smaller rainforest stands also occur in Mount Neville Nature Reserve (NPWS 1984) and Wombat Creek State Conservation Area (Gilmour & Helman 1991). All of these rainforest areas form part of Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions Endangered Ecological Community.

Twelve species listed as endangered and eight species listed as vulnerable under the TSC Act have been recorded in the planning area (see Appendix A), with another two vulnerable species predicted to occur within the planning area. Ten of these species are also listed as nationally threatened under the EPBC Act.

A further 43 species are considered to be rare or poorly known under the criteria of Briggs and Leigh (1996), or otherwise regionally significant by Sheringham and Westaway (1995) or Richards (1999) (see Appendix B). Some of these species have particular conservation significance because they are found nowhere else and, as such, warrant specific protection.

Several of the restricted or threatened plants in the planning area are endemic to the Kangaroo Creek Sandstone geology in the area north of Grafton. These species include Banyabba grevillea (*Grevillea banyabba*), Rupp's wattle (*Acacia ruppii*) and Banyabba shiny-barked gum (*E. pachycalyx* subsp. *banyabba*) (NPWS 2002b). Other sandstone endemics recorded in the planning area have a wider distribution, such as the hairy melichrus (*Melichrus hirsutus*) and red-leaved daisy bush (*Olearia stilwelliae*).

A number of species recorded in the planning area are at their limit of geographical distribution, including the vulnerable square-stemmed olax (*Olox angulata*). A large stand of cabbage tree palms (*Livistona australis*) occurs in the upper reaches of Cabbage Tree Creek, within Mount Neville Nature Reserve. This species does not usually occur so far inland from the coast.

Strategies for the recovery of threatened species, populations and ecological communities have been set out in a statewide *Threatened Species Priorities Action Statement* (DECC 2007). These actions are currently prioritised and implemented through the *Saving our Species* program which aims to maximise the number of threatened species that can be secured in the wild in New South Wales for 100 years (OEH 2013c). Individual recovery plans may also be prepared for threatened species or communities to consider management needs in more detail.

Issues

Inappropriate fire regimes are a threat to species diversity in the planning area. In particular, too-frequent fire is a threat to the survival of fire sensitive species and communities, some of which are restricted to the planning area (see Section 4.2).

Inappropriate road or trail maintenance techniques, unrestricted vehicle use and camping may also pose a threat to several significant populations occurring in close proximity to roadsides within the planning area. Examples include populations of Rupp's wattle in Fortis Creek National Park and Banyabba Nature Reserve, and Banyabba shiny-barked gum within Banyabba Nature Reserve (Sections 3.6 and 5.1). However, some degree of periodic disturbance appears to be beneficial to Rupp's wattle, which can regenerate prolifically following fire and soil disturbance.

Grazing by cattle, inappropriate fire regimes and flooding have been identified as threats to the square-stemmed spike-rush (*Eleocharis tetraquetra*) (NPWS 1999a). These are potential threats to this species where it occurs within Fortis Creek National Park (see Sections 4.1, 4.2 and 4.3).

Loss and degradation of native plant habitat by weed species also threaten native vegetation structure and health (see Section 4.1).

Vegetation communities in the planning area have been recorded using a variety of classifications. As a result, mapping of the vegetation types across the planning area is not consistent or complete.

Desired outcomes

- Populations of significant plants and ecological communities are conserved.
- Negative impacts on threatened species are minimised.
- Structural diversity and habitat values are restored in degraded areas.
- Knowledge of endemic flora species, and their ecological and management requirements, is increased.

Management response

- 3.2.1 Support the identification and implementation of recovery actions for threatened species, populations and ecological communities occurring in the planning area.
- 3.2.2 Establish a rare, threatened and significant flora marker system to protect roadside specimens from damage during field operations. If necessary, erect fencing or other barriers to protect roadside populations from damage.
- 3.2.3 Manage fire regimes in accordance with known fire frequency thresholds for vegetation species and communities, with particular attention to the protection of significant flora (see Section 4.2).
- 3.2.4 Encourage research into the distribution, ecological requirements and management requirements of native species recorded in the planning area, with particular emphasis on threatened or restricted species and those most susceptible to impact from fire and introduced species.

- 3.2.5 Encourage preparation of a vegetation map based on one vegetation classification system, of appropriate detail to guide management, using existing studies and conducting further flora surveys as required.

3.3 Native animals

The planning area contains some of the most diverse and significant mammal habitats in New South Wales (SFNSW 1995). In particular, the moist open forests are important habitats for the koala (*Phascolarctos cinereus*), nectivorous possums and gliders, and small to medium-sized macropods (SFNSW 1995). Maternal camps of the black flying-fox (*Pteropus alecto*) and grey-headed flying-fox (*P. poliocephalus*) are located in Banyabba Nature Reserve and Mount Neville Nature Reserve respectively (NPWS 1998a).

Native animal surveys undertaken in the planning area (e.g. NPWS 1995b; Clancy 1998; and NPWS surveys conducted in Fortis Creek National Park in 2009 and in Kooyong State Conservation Area in 2010) have recorded 257 species (137 birds, 60 mammals, 39 reptiles and 21 frogs), including 38 threatened species listed under the TSC Act. Threatened animal species known or predicted to occur in the planning area are listed in Appendix C.

Important species include the black-striped wallaby (*Macropus dorsalis*) which is close to its geographical limit in the planning area, and the Tommy roundhead dragon (*Diporiphora australis*) which until recently was not known to occur in New South Wales. The area provides refuge for many mammal species whose distributions have declined elsewhere in Australia, including the rufous bettong (*Aepyprymnus rufescens*) and the brush-tailed phascogale (*Phascogale tapoatafa*) (SFNSW 1995).

Ten threatened species of insectivorous bat have been recorded in or near the planning area. Mount Neville Nature Reserve contains an important roost site for the eastern bentwing-bat (*Miniopterus schreibersii oceanensis*).

Threatened rainforest animal species known to occur in or near the planning area include the sooty owl (*Tyto tenebricosa*), wompoo fruit-dove (*Ptilinopus magnificus*), rose-crowned fruit-dove (*P. regina*) and the giant barred frog (*Mixophyes iteratus*).

The planning area also serves as an important over-wintering site for migratory and nomadic birds, such as the white-throated needletail (*Hirundapus caudacutus*) and sacred kingfisher (*Todiramphus sanctus*) (NPWS 1984).

The planning area provides a significant core area of natural habitat along the southern section of the Richmond Range. This core area forms part of an extensive ecological corridor linking coastal habitat, such as that of Bundjalung National Park, to the protected areas of the McPherson Range on the New South Wales – Queensland border (Scotts 2003). This corridor includes NPWS parks along the northern part of the Richmond Range (see Section 1.1). The corridor assists in the migration of populations and the distribution of genetic material that is essential in maintaining species biodiversity.

The NPWS Key Habitats and Corridors Project (Scotts 2003) identified several areas of key habitat for priority animal species in north-east New South Wales. Key habitat for species in the Moist Escarpment – Foothills and Dry Coastal Foothills native animal assemblages has been identified within Mount Neville and Banyabba nature reserves and Fortis Creek National Park. Portions of Mount Pikapene National Park have been identified as key habitat for species within the Moist Escarpment – Foothills, Wet Escarpment – Foothills and Wet Escarpment native animal assemblages. Appendix D lists the species that make up each assemblage.

Part of Mount Pikapene National Park has also been identified as a centre of endemism for invertebrate species (Scotts 2003).

Recovery plans for several animal species that occur in the planning area have been prepared (e.g. large forest owls, the yellow-bellied glider and the koala). Strategies for the recovery of

threatened species and populations have also been set out in a statewide *Threatened Species Priorities Action Statement*, and prioritised and implemented through the *Saving our Species* program.

Issues

A large proportion of birds and mammals recorded in the planning area require tree hollows for dens or roosting, or rely on native vegetation as a food source. High-intensity or too-frequent fires result in destruction of tree hollow habitat and food trees. The glossy black-cockatoo (*Calyptorhynchus lathamii*) is one such species that is threatened as a result of too-frequent fires within the planning area which affect the availability of its key food species, forest oak (*Allocasuarina torulosa*), and tree hollows for nesting. Fires during breeding seasons also adversely impact population succession (see Section 4.2).

Introduced species are also a threat to native animals in the planning area through predation, damage to habitat, competition and transmission of disease (see Section 4.1).

Further research on the distribution of animal species and population dynamics would help guide management planning. Another priority for research is the identification of key threatening processes to threatened animal species such as the glossy black-cockatoo, rufous bettong and brush-tailed phascogale, and their response to fire and introduced species.

Desired outcomes

- Populations of significant native animal species are conserved.
- Negative impacts on threatened native animals are minimised.
- The habitat and populations of all threatened animals are protected and maintained.
- The corridor value of the planning area for native animals is maintained.
- Knowledge of existing animal species, and their ecological and management requirements, is increased.

Management response

- 3.3.1 Support the identification and implementation of recovery actions for threatened species, populations and ecological communities occurring in the planning area.
- 3.3.2 Encourage research into the distribution, ecological requirements and management requirements of native species recorded in the planning area, with particular emphasis on threatened or restricted species and those most susceptible to impact from fire and introduced species.

3.4 Aboriginal heritage

The planning area is part of a landscape of cultural importance to the Bandjalang and Western Bundjalung Aboriginal peoples, and falls within the areas of the Baryulgil, Bogal, Casino, Grafton-Ngerrie, Jana Ngalee, Jubullum and Yaegl local Aboriginal land councils.

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

While the NSW Government has legal responsibility for the protection of Aboriginal sites and places, NPWS acknowledges the right of Aboriginal people to make decisions about their own heritage.

Forested areas have traditionally been a source of food and other resources for the Aboriginal community. The use of forests has continued since European arrival as a source of food and

traditional medicines (Hall & Lomax 1993). Forests are also traditionally places of religious and spiritual value to Aboriginal people, both in terms of tracts of Country and specific sites (Hall & Lomax 1993). Byrne (1987) suggests that mountainous landscapes in particular are of cultural value to Aboriginal people, as these often 'untouched' wilderness areas provide a link to the traditional landscape.

Aboriginal sites are places with evidence of Aboriginal occupation or that are related to other aspects of Aboriginal culture. They are important as evidence of Aboriginal history and as part of the culture of local Aboriginal people. The planning area contains a network of cultural sites including mythological sites, open campsites, a stone arrangement, stone artefacts and rock shelters containing paintings and engravings. These features are part of an extensive system of related cultural sites and places associated with the Richmond Range and are recorded on the NPWS Aboriginal Heritage Information Management System.

Rock art shelters occur in several parks within the planning area. The dry pigment art style, the types and figures represented, colours used and the drawing technique are representative of the Clarence Valley art style. One site in Mount Neville Nature Reserve, described in detail by McBryde (1974), was listed on the Register of the National Estate in 1984 (DoE 2015b). Conservation works have been undertaken to protect this significant site in line with a conservation report (NPWS 1998b).

A native title claim on behalf of the Bandjalang People (NC98/019), recognised by the Federal Court on 2 December 2013, includes the eastern parts of Banyabba and Mount Neville nature reserves; all of Lawrence Road State Conservation Area; and most of Banyabba, Gurranang and Kooyong state conservation areas. This determination of native title rights acknowledges the Bandjalang People's traditional laws and customs and legally recognises the Bandjalang People's connection to Country.

The rest of the planning area is currently subject to a registered native title claim on behalf of the Western Bundjalung People (NC11/005). This claim is active but at the time of publication (2016) has not been determined.

It is likely Indigenous Land Use Agreements or other joint management arrangements will be negotiated which will provide detailed guidance on how the Bandjalang People and (potentially) the Western Bundjalung People will be actively involved in management of the relevant parks.

Issues

The planning area is located within the traditional Country of a number of groups within the Bundjalung Nation, and it is important that the relevant Aboriginal people, particularly the Bandjalang and Western Bundjalung peoples, are given the opportunity to be meaningfully involved in the management of the parks that lie within their Country.

Due to the lack of surveys, an archaeological survey and cultural assessment needs to be undertaken prior to any works with the potential to impact Aboriginal sites and places.

Threats to the rock art include mud wasp nests attached to the art, cobwebs (which hold dust near the painted rock surface) and marginal salt weathering.

Desired outcomes

- Aboriginal cultural values are recognised and protected in partnership with the Aboriginal community.
- Significant Aboriginal places and values are identified and protected.
- Bandjalang and Western Bundjalung peoples are involved in management of the planning area.

Management response

- 3.4.1 Consult and involve the Bandjalang and Western Bundjalung peoples, other relevant Aboriginal community organisations and custodial families in the management of their Country, including the management of Aboriginal sites, places and cultural and natural values. This will include implementation of any negotiated Indigenous Land Use Agreement or other joint management arrangements.
- 3.4.2 Inspect and record the condition of significant Aboriginal art shelter sites every 3 years and undertake protective works as necessary.
- 3.4.3 Encourage further research and surveys into the identification of Aboriginal sites, places and other values with the involvement of the Aboriginal community.

3.5 Historic heritage

Heritage places and landscapes are made up of living stories as well as connections to the past which can include natural resources, objects, customs and traditions that individuals and communities have inherited, and wish to conserve for current and future generations. Cultural heritage comprises places and items that may have historic, scientific, cultural, social, archaeological, architectural, natural or aesthetic significance. NPWS conserves the significant heritage features of NSW parks.

Records of European occupation in the area, mainly in relation to forestry and cattle grazing, date back to the early 1800s (SFNSW 1995). The land that is now Fortis Creek National Park was first used for cattle grazing in the 1840s (Margules 1992).

There is little remaining evidence of these past uses in the planning area other than roadways and fences, such as the quarantine tick fence.

Historic trails and roads

Lawrence Road (now known as Pringles Way), located along the south-west boundary of Lawrence Road State Conservation Area, was first marked by Thomas Pringle in 1856. It quickly became part of the major route for drays transporting goods between the port of Lawrence on the Clarence River, and Tenterfield in northern New England Tableland (Hall 1977). Despite competition from an alternative route to the rival port of Grafton, the Lawrence to Tenterfield Road was in regular use until 1886 (Hall 1977). At that time, Pringle was also the owner of the inn known as Travellers' Rest, one of the regular stops along this route. It occupied a site in what is now Banyabba State Forest, just east of Banyabba State Conservation Area.

Within Banyabba State Conservation Area, Ogilvie Trail is named after pioneer Edward Ogilvie, who owned an extensive run in the Upper Clarence south of Tabulam. In 1860 Ogilvie had established a wharf at Lawrence on the Clarence River in 1860. In 1862 he built a road which ran from Ogilvie's property near Baryulgil, through Upper Fineflower and around Dome Mountain (to the west of Banyabba Nature Reserve), joining to Lawrence to Tenterfield Road to provide a better link between the town of Lawrence and his property (Hall 1977). This link allowed the materials for Yugilbar Castle, built on Ogilvie's property, to be shipped to Lawrence and then transported north-west along this route.

This original route may also have later been used by prospectors to reach Lionsville and Solferino on the Gibraltar Range during the 1890s gold rush. Early parish maps indicate that the historical route known as Ogilvie Trail lay further east than the current alignment of Ogilvie Trail in Banyabba State Conservation Area.

In 1912, a road across the Richmond Range between Busbys Flat and Yates Flat in the Upper Clarence was constructed to encourage settlement of the proposed town of Alice (Hall 1977). This road is believed to be the same as the current route of Busbys Flat Road and Kimbin Pikapene Road, a public road through Mount Pikapene National Park.

Tick quarantine fence

A former cattle tick quarantine fence defines part of the boundaries of Banyabba State Conservation Area, Banyabba and Mount Neville nature reserves, and Mount Pikapene National Park, and traverses sections of Banyabba Nature Reserve and Mount Pikapene National Park. The fence was erected in the 1920s and extended along the Richmond Range to the Queensland border. It was designed to restrict unauthorised stock movement into northern New South Wales and contain the southward spread of the tropical cattle tick (*Boophilus microplus*). A number of houses were built along this fence line to accommodate tick inspectors. The tick fence was patrolled and maintained until 1994, and the southern boundary of the quarantine zone was formally released in December 1997, after which time stock movement restrictions were lifted. Sections of the tick quarantine fence and gates remain within the planning area. Sites of occupancy associated with the tick fence, such as house ruins, also remain in some locations. A cattle dip and yards associated with the tick control programs — one of approximately 1600 in north-east New South Wales — are located in the Six Mile Swamp section of Mount Neville Nature Reserve (see Section 5.1).

Forestry

Some parts of the planning area were selectively harvested for hardwood during the 1940s and 1950s, and more intensively logged in the 1960s, when they were state forest. There are no known remains of heritage significance from this previous land use within the planning area.

Former houses

Parts of Mount Neville Nature Reserve were formerly freehold land. An area in the Cabbage Tree Creek valley (locally known as Sugarloaf) contained a timber slab homestead which was condemned in 1953 and destroyed by wildfire in 1980. A concrete slab still remains. An area in the Six Mile Swamp valley (locally known as Franey's land) is the site of an early homestead.

A former inholding of approximately 40 hectares within Fortis Creek National Park, called Morgans Camp, contained a house constructed from locally hand-hewn sandstone using a technique known as 'feather and wedge'. The house and associated structures were subject to vandalism and assessed as posing serious ongoing safety concerns. A number of potentially invasive garden plants were growing around the house and yard area. The structures and most of the exotic plants were removed in 2006, with a small corner section of the house retained.

Issues

A number of introduced slash pines (*Pinus elliottii*) were planted in the vicinity of the Cabbage Tree Creek valley homestead. These pines have reproduced and have now displaced native vegetation. It is proposed to remove these pines to allow revegetation of the native plant community (see Section 4.1).

Structures and disturbances assessed as having little cultural or historic value (e.g. cattle dip sites and clearings) should be rehabilitated (see Section 5.1).

Some sites of early European occupation have not been assessed to determine their heritage significance and appropriate management. These sites include the cattle tick quarantine fence lines and associated infrastructure (in Banyabba and Mount Neville nature reserves, Banyabba State Conservation Area and Mount Pikapene National Park) and the site of the former homesteads (in Mount Neville Nature Reserve).

Fence lines associated with former grazing use of the planning area can pose a hazard for native animals.

Desired outcomes

- Negative impacts on historic heritage values are minimised.

- Understanding of the cultural values of the planning area is improved.
- Features of historic significance are identified, recorded and protected.

Management response

- 3.5.1 Record, assess and manage sites of early European occupation in accordance with their assessed level of significance.
- 3.5.2 Protect and where appropriate interpret historic sites identified as having significant cultural or historic value. In particular, retain the tick fence on the planning area's boundary where it serves a management purpose and maintain it in the character of the original fence. The wire of other sections of fence may be removed to reduce the hazard to native animals.
- 3.5.3 Encourage research into early European use and historic sites in the planning area.

3.6 Visitor use

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

Wilderness areas such as the Banyabba Wilderness have high environmental quality and an absence of the sounds, smells and sights of modern society. Wilderness areas provide a sense of naturalness and remoteness from urban or rural development, and opportunities for self-reliance, adventure, challenge and exploration.

The need to retain wilderness in a substantially unmodified state and to provide opportunities for solitude and self-reliant recreation directs the management approaches that can be applied. Facilities, signposting and other management devices are generally avoided unless essential for public safety, management operations or environmental protection.

The planning area is not a focal point for recreation, as there are a number of high visitor use areas located nearby, including the coastal reserves to the east, such as Bundjalung and Yuraygir national parks, and the World Heritage rainforest reserves to the west, including Washpool and Gibraltar Range national parks. A wide variety of activities such as camping, walking, canoeing, four-wheel driving, caravanning, fishing and cycling can be undertaken in those national parks. The Richmond Range and Toonumbar national parks to the north of the planning area also provide a range of recreational opportunities, including camping, picnicking, walking and adventure activities. State forests adjacent to the planning area also provide for a range of recreation activities.

Low levels of self-reliant activities such as remote bushwalking, bush camping and nature observation occur within the planning area. The roads in the planning area have also been used for cycling, trail bike riding and four-wheel driving.

No formal recreational facilities are provided in the planning area. A day use and camping area is located in Mount Pikapene State Forest adjoining the eastern entrance to Mount Pikapene National Park (see Figure 4).

Public vehicle access

Public vehicle access to the planning area is principally via the Summerland Way, Coaldale Road, Pringles Way and Busbys Flat Road or Kimbin Pikapene Road. Access to the boundary of individual reserves is detailed in Table 1 and shown on Figures 2, 3 and 4. Vehicle access to parts of the planning area, such as Chapmans Peak Nature Reserve, sections of Mount Neville Nature Reserve and Wombat Creek State Conservation Area, is via roads across adjoining private property which are not open for use by the public except via prior arrangement with the property owner (see Section 5.1).

Table 1: Public vehicle access to the planning area boundary

Park	Access
Banyabba Nature Reserve	Mount Marsh Road (from west) Mount Neville Road
Banyabba State Conservation Area	Back Forest Road Ogilvie Trail
Chapmans Peak Nature Reserve	No public access
Corymbia State Conservation Area	Summerland Way
Fortis Creek National Park	Summerland Way Coaldale Road
Gurrang State Conservation Area	Summerland Way Gurrang Railway Station Road
Kooyong State Conservation Area	Oil Rig Road
Lawrence Road State Conservation Area	Pringles Way
Mount Neville Nature Reserve	Seerys Road or Bennetts Road Fullers Road
Mount Pikapene National Park	Busbys Flat Road or Kimbin Pikapene Road Old Coongbar Road Pikapene Trail
Mount Pikapene State Conservation Area	Old Coongbar Road Forty Acres Road
Wombat Creek State Conservation Area	No public access

Note: outside the planning area's boundaries these roads are not maintained by NPWS and may not be trafficable to two-wheel drive vehicles at all times, especially during or after wet weather.

The road network associated with the planning area has a number of different tenures.

'Public roads' (called 'road – off park' on Figures 2, 3 and 4) are roads on a road reserve which may be administered by the local council, Roads and Maritime Services (formerly the Roads and Traffic Authority) or Department of Primary Industries – Lands (formerly the Department of Lands). A number of public roads traverse the planning area, including Kimbin Pikapene Road through Mount Pikapene National Park, Old Coongbar Road through Mount Pikapene State Conservation Area, the Summerland Way and Gurrang Railway Station Road through Gurrang State Conservation Area, and the middle section of Wongabeena Road through Corymbia State Conservation Area. There are also a number of road reserves on which a road has not been constructed or 'made' (see Section 5.1).

'Park roads' are managed by NPWS to a standard suitable for all vehicles or to four-wheel drive standard (as indicated in Figures 2, 3 and 4), except where easements or other access provisions apply. 'Neighbour access trails' are maintained primarily for the purposes of accessing private property. These trails currently provide the only practical means of access to these lands. They are typically maintained by NPWS although the neighbouring landholder may undertake additional maintenance works with the agreement of NPWS. During the life of this plan, such trails may become management trails should they no longer be required for private property access. Park roads and neighbour access trails are listed in Table 2. All public vehicles, including trail bikes, need to be registered and driven by licensed drivers/riders when using public roads, park roads and neighbour access trails.

Table 2: Park roads and neighbour access trails within the planning area

Park ~	Park roads	Neighbour access trails*
Banyabba NR	Mount Marsh Road (from west, only to Mt Neville Road)	Coaldale Trail
Banyabba SCA	Back Forest Road Ogilvie Trail (4WD)	
Corymbia SCA	Corymbia Road Wongabeena Road (east)	Wongabeena Road (west)
Fortis Creek NP	Dilkoon Trail^ (to the intersection of Centre Trail)	Junction Creek Trail^
Gurranang SCA		Khan Trail
Kooyong SCA	Oil Rig Road (4WD)	
Lawrence Road SCA		Parallel Trail
Mount Neville NR	Black Cockatoo Trail^ (between Fullers Road & Warringah Trail)	
Mount Pikapene NP	Forty Acres Road Coffee Creek Road (4WD)	North Western Boundary Trail^ Taylors Trail^ Tower Road (west of Taylors Trail)
Wombat Creek SCA		Wombat Creek Trail

~ NR = Nature Reserve; NP = National Park; SCA = State Conservation Area.

* Neighbour access trails are open to the public primarily for private property access. Should alternative access to these properties become available, these trails will be closed to public vehicles and designated as management trails.

^ These trails lie within the reserved area of the park. Other roads and trails listed are ministerial roads (see Section 5.1) or are on public road reserves.

'Management trails' are maintained primarily for fire and weed management by NPWS or for other authorised uses. These trails are not designed or available for vehicle use by the general public. Many trails contain steep sections on highly erosive sandstone soils, which are easily damaged by indiscriminate use (see Section 3.1).

There are no park roads within the Banyabba Wilderness as public vehicle access is prohibited in wilderness areas. Dry weather two-wheel drive vehicle access to the boundary of the Banyabba Wilderness is available from the Summerland Way via Dilkoon Trail in the eastern part of Fortis Creek National Park, or through the Banyabba State Forest and State Conservation Area via Back Forest Road. Pedestrian access is also available from Coaldale Road to the west.

Camping

Self-reliant pack or bush camping is mainly undertaken in the Banyabba Wilderness. No formal camping areas or facilities will be provided and campers are responsible for containing and removing their own rubbish. Camping areas with facilities are provided in the nearby Mount Pikapene State Forest; and in Toonumbar, Richmond Range, Bundjalung, Yuraygir, Nymboida and Nymboi-Binderay national parks.

Bushwalking

Bushwalking allows visitors to be in close contact with the environment and can increase understanding and enjoyment of parks and the environment generally. The planning area provides a range of bushwalking opportunities, based primarily on the existing management trail system, which have varying degrees of physical challenge and self-reliance and within a diversity of environmental settings. Trails in Mount Pikapene National Park traverse a range of forest types including large stands of dry rainforest. Similarly, Fortis Creek National Park contains trails that provide a range of circuits of varying lengths suitable for bushwalking.

Cycling

The planning area provides opportunities for cycling along a number of management trails and roads, consistent with the NPWS *Sustainable Mountain Biking Strategy* (OEH 2011). Current levels of use of the planning area's trails and roads for cycling are low.

Under NPWS policy, cycling is only allowed on management trails in nature reserves and wilderness areas where it will not degrade natural or cultural heritage values. Cycling along management trails and roads within the planning area is unlikely to impact on reserve or wilderness values because of the low levels of use and potential conflict with other track users is minimal. However, this use and its impacts will be monitored. Hygiene precautions for vehicles (including bicycles) are a particular priority to prevent phytophthora entering the parks within the area, in particular the Banyabba Wilderness. Where cycling is allowed on management trails through nature reserves and wilderness, this will be indicated by signage in accordance with NPWS policy. Cycling off trails is not permitted.

Horse riding

Horse riding is a popular recreational activity that has cultural associations for many Australians. The NPWS *Strategic Directions for Horse Riding in NSW National Parks* (OEH 2012a) provides a framework to improve riding opportunities in eight priority regions in New South Wales, including the Northern Rivers Region.

Within the planning area, the specific park context — including particular conservation, cultural and recreational values of the area — is taken into consideration when identifying horse riding opportunities.

Horse riding is currently allowed on Kimbin Pikapene Road, which is a public road through Mount Pikapene National Park, and on Gurrang Railway Station Road, which is a public road through Gurrang State Conservation Area. Horse riding may be permitted by consent on neighbour access trails.

In accordance with the *Northern Rivers Region Horse Riding Work Plan 2013* (OEH 2013b), a number of horse riding opportunities have been identified and will be investigated, depending on demand, to assess their use:

- Ogilvie and Saltwater Creek trails, Back Forest Road and other trails in Banyabba State Conservation Area
- Keembin Creek, Forty Acres and Tainsh roads in Mount Pikapene National Park
- that section of Dilkoon Trail outside the Banyabba Wilderness in Fortis Creek National Park
- Dove, Swallow, Short Cut and Corbetts Waterhole trails to create a small loop ride in Fortis Creek National Park
- Oil Well Road and Needlebark Trail in Kooyong State Conservation Area.

Investigation of these trails should give special consideration to potential impacts on threatened species and soils. It is likely that, should horse riding be allowed on any of these trails or roads, provisions will be applied that exclude use when wet. Further investigation is also needed to

assess the potential environmental impacts on other trails in Fortis Creek National Park including Robin Trail.

Extensive opportunities for horse riding are provided on other land tenures adjacent to the planning area, such as the Banyabba, Camira, Gibberagee, Whiporie, Mount Belmore, Fullers, Cherry Tree, Mount Marsh and Mount Pikapene state forests.

Group and commercial activities

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

Non-commercial large-scale organised group activities require consent under the NPW Regulation. Organised group activities of a commercial nature require licensing under the NPW Act. All activities must be consistent with the management principles of the park, and be compatible with the natural and cultural heritage values of the planning area. Applications will be assessed in accordance with relevant NPWS policies and procedures.

There are currently no commercial recreational activities conducted in the planning area. Mount Pikapene National Park and that part of Fortis Creek National Park outside the Banyabba Wilderness are considered most suitable for low-key and nature-based commercial tours or group activities.

Issues

Recreation is not seen as a primary focus for the planning area because:

- the planning area supports a high number of threatened species, many of which have a major occurrence or are endemic to the area
- much of the planning area is classified as nature reserve where recreation is not a primary management objective (see Section 2.1)
- a range of recreational facilities and opportunities are provided in nearby national parks, state forests, other public land tenures and private property
- the rugged topography of the planning area affords limited access
- access roads and trails within the planning area are based on erodible soils that will not sustain high levels of vehicle use, particularly in sandstone areas
- the provisions of the Wilderness Act preclude activities other than low-impact, self-reliant activities from occurring in wilderness areas (see Section 2.2).

Desired outcomes

- Visitor use of the planning area is appropriate and ecologically sustainable.
- Recreation activities are low-key, self-reliant, and compatible with park values and legislative principles.
- Visitor opportunities encourage appreciation and awareness of the planning area's values and their conservation.

Management response

Public vehicle access

3.6.1 Allow public vehicle access, including access by registered trail bikes, on the public roads, park roads and neighbour access trails in the planning area as listed in Table 2 and shown in Figures 2, 3 and 4. Access may be restricted during periods of wet weather or if the neighbour access trails are no longer essential for neighbour access. Prohibit public vehicle access on management trails.

- 3.6.2 If required due to usage levels, create a vehicle parking and turn-around area at the intersection of the Dilkoon and Centre trails, and promote this to visitors to the Banyabba Wilderness.

Camping

- 3.6.3 Allow bush camping within Mount Neville Nature Reserve, Banyabba Nature Reserve, Banyabba State Conservation Area, Fortis Creek National Park and Mount Pikapene National Park at distances more than 1 kilometre from a park road or a public road, more than 500 metres from a boundary with private property, and more than 20 metres from a watercourse. No facilities will be provided.

Bushwalking

- 3.6.4 Encourage bushwalking throughout the planning area, primarily using the management trail network.

Cycling

- 3.6.5 Allow cycling on park roads and management trails in the planning area. Monitor usage and impacts of cycling. Review cycling access if necessary to reduce impacts on the planning area's values. This may include closure of specific management trails to cycling during wet conditions and the implementation of appropriate hygiene precautions to reduce the spread or introduction of pathogens and weeds (see Section 4.1).

Horse riding

- 3.6.6 Allow horse riding on Kimbin Pikapene Road and Gurranang Railway Station Road, and on neighbour access trails to access private property with permission.
- 3.6.7 Investigate horse riding opportunities, depending on demand, on trails in the following reserves:
- Banyabba State Conservation Area: Ogilvie Trail, Saltwater Creek Trail and Back Forest Road, and other trails.
 - Fortis Creek National Park: Dilkoon Trail (outside of wilderness only), and Dove, Swallow, Short Cut and Corbetts Waterhole trails to create a small loop ride. Further investigation is also needed to assess the potential environmental impacts on other trails including Robin Trail.
 - Kooyong State Conservation Area: Oil Well Road and Needlebark Trail.
 - Mount Pikapene National Park: Keembin Creek, Forty Acres and Tainsh roads.

Any investigation requires special consideration of potential impacts on threatened species and soils. Should horse riding be allowed, it is likely that conditions will be applied that exclude use during wet conditions.

Group and commercial activities

- 3.6.8 Visitor group size limits apply within the planning area except with written consent from NPWS. Group sizes are limited to 15 persons within the Banyabba Wilderness, and 20 persons within the planning area outside of the Banyabba Wilderness.

3.7 Information and education

Information provision assists the protection of natural and cultural heritage, promotes support for conservation, and increases the enjoyment and satisfaction of visitors.

Any promotion of the planning area must be compatible with the access provisions provided in this plan (see Section 3.6), wilderness management principles for wilderness areas (see

Section 2.2), the conservation of threatened species (see Sections 3.2 and 3.3) and cultural values (see Sections 3.4 and 3.5).

Communication with neighbours, community groups and other agencies regarding the values of the planning area and proposed conservation programs will help raise public awareness of the values of the planning area and encourage cooperation regarding park management programs. NPWS liaises with neighbours as part of pest and fire management activities (see Sections 4.1 and 4.2).

Desired outcomes

- Visitors, stakeholders and neighbours understand and appreciate the significant natural values, including corridor values, of the planning area, its recreational opportunities and park management programs.
- Park management programs are undertaken in consultation and cooperation with neighbours.

Management response

- 3.7.1 Install an interpretive display on the values of Fortis Creek National Park, Banyabba Nature Reserve and the Banyabba Wilderness at the intersection of Dilkoon Trail and the Summerland Way.
- 3.7.2 Erect signage at the boundary of the Banyabba Wilderness on Banyabba Trail, Saltwater Trail, Dilkoon Trail, Fortis Creek Trail, Junction Creek Trail and Morgans Camp Trail, and other boundary locations as required, identifying the activities that may and may not occur in the Banyabba Wilderness.

4 Threats

4.1 Pests

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

Pest management strategy

Detailed surveys of weed and pest animal species were undertaken during the preparation of a draft pest management plan for the Southern Richmond Range parks (NPWS 2002a). This information has now been incorporated into a region-wide pest management strategy.

NPWS prepares regional pest management strategies which identify pest species across that region's parks and priorities for control, including actions listed in the *Priorities Action Statement*, threat abatement plans and other strategies such as the NSW *Biodiversity Priorities for Widespread Weeds* (NSW DPI & OEH 2011). The pest management strategy also addresses liaison with other stakeholders, including North Coast Local Land Services, Far North Coast Weeds, Clarence Valley Council and neighbours, regarding coordinated approaches to pest control programs.

The NPWS *Regional Pest Management Strategy 2012–17, Northern Rivers Region – A new approach for reducing impacts on native species and park neighbours* (OEH 2012b) identifies pest species and priority programs in the region. The overriding objective of the pest management strategy is to minimise adverse impacts of introduced species on biodiversity and other park and community values while complying with legislative responsibilities. The strategy aims to avoid impacts from pest control programs on non-target species, in particular rare, threatened and significant species and communities. The strategy also identifies where other site- or pest-specific plans or strategies need to be developed to provide a more detailed approach.

There is an ongoing need to update knowledge on the distribution and abundance of introduced species in the planning area to inform the development and implementation of effective pest control programs.

Weeds

Several noxious weeds are known to occur in the planning area (NPWS 2002a). Groundsel bush (*Baccharis halimifolia*) is known to occur in Banyabba Nature Reserve, Mount Pikapene National Park and the lower reaches of some creeks in Fortis Creek National Park. An infestation of Noogoora burr (*Xanthium occidentale*) exists in Fortis Creek National Park, within the Corbetts Water Hole clearing along Dilkoon Creek. Giant Parramatta grass (*Sporobolus fertilis*) occurs along trails in both Mount Pikapene and Fortis Creek national parks, as well as in Mount Neville and Banyabba nature reserves. Crofton weed (*Ageratina adenophora*) and mistflower (*Ageratina riparia*) infestations are known to occur in the vicinity of Mount Marsh in Banyabba Nature Reserve, along Cabbage Tree Creek in Mount Neville Nature Reserve and in Fortis Creek National Park. The *Noxious Weeds Act 1993* requires NPWS to control noxious weeds so they do not spread to neighbouring properties.

A number of serious environmental weeds are also present in the planning area (NPWS 2002a). An infestation of cat's claw creeper (*Macfadyena unguis-cati*), a highly invasive vine weed, occurs in and adjacent to Mount Pikapene National Park. Invasion and establishment of exotic vines and scramblers is listed as a key threatening process under the TSC Act. The regional pest management strategy identifies control of cat's claw as a critical priority project.

Several garden escapees, classified as environmental weeds, occurred at Morgans Camp within Fortis Creek National Park and have been subject to a major control program. Loss and

degradation of native plant and animal habitat by invasion of escaped garden plants is listed as a key threatening process under the TSC Act. This site will continue to be monitored, with follow-up control as required.

Approximately 30,000 slash pines occupy an area of 40 hectares along Cabbage Tree Creek in Mount Neville Nature Reserve, including a dense area of 18 hectares. This infestation has self-sown from approximately 16 parent plants that were planted in the 1930s near the site of the former homestead on Cabbage Tree Creek (see Section 3.5). The pines are out-competing native vegetation to form a monoculture.

Lantana

Lantana (*Lantana camara*) is a large flowering shrub native to Central and South America. Lantana is a vigorous invader of disturbed areas, often forming dense thickets. It is spread mainly by birds and thrives in warm environments with high rainfall, where the weed grows along forest edges, penetrates disturbed rainforest and invades open eucalypt woodlands and pastures. Invasion, establishment and spread of lantana is listed as a key threatening process under the TSC Act. Lantana is a noxious weed throughout New South Wales and a Weed of National Significance.

A national *Plan to Protect Environmental Assets from Lantana* has been developed which establishes national conservation priorities for the control of lantana (Biosecurity Queensland 2010). It identifies the research, management and other actions needed to ensure the long-term survival of native species and ecological communities affected by the invasion of lantana.

Lantana occurs in most of the parks within the planning area, with scattered infestations throughout Banyabba State Conservation Area, Banyabba Nature Reserve, Fortis Creek National Park, Kooyong State Conservation Area, Mount Neville Nature Reserve, Mount Pikapene National Park and Wombat Creek State Conservation Area. There is also a small isolated infestation in Chapmans Peak Nature Reserve.

The rainforest in Mount Pikapene National Park (an endangered ecological community) is under threat from invasion by lantana, and so lantana control in that park is considered a critical priority. Infestations of lantana within the Banyabba Wilderness are also considered priorities for control, with control in Fortis Creek National Park considered a critical priority due to the likely impact of lantana on threatened species and communities.

Introduced animals

Introduced animals known to occur in the planning area include wild dogs (*Canis lupus* subsp.), European red foxes (*Vulpes vulpes*), feral cats (*Felis catus*), feral horses (*Equus caballus*), wild pigs (*Sus scrofa*) and European rabbits (*Oryctolagus cuniculus*). Domestic cattle also occasionally stray into parts of the planning area. NPWS is responsible under the *Local Land Services Act 2013* (LLS Act) to manage declared pest animals (namely rabbits, feral pigs, foxes and wild dogs) found within the planning area.

Feral pigs

There are scattered populations of feral pigs in Kooyong State Conservation Area. The impact of feral pigs on conservation values is substantial because they forage, wallow and dig in wetland areas. Pigs cause major disturbance and damage to soils, roots, sensitive understorey plants and wetland environments. Areas disturbed by feral pigs are at risk from subsequent weed invasion and soil erosion. They are also a potential host of a number of exotic diseases.

Predation, habitat degradation, competition and disease transmission by feral pigs is listed as a key threatening process under both the TSC Act and the EPBC Act (NSW SC 2004; TSSC 2001b). A threat abatement plan has been prepared under the EPBC Act (DEH 2005) which sets out a national framework to guide coordinated actions to address this threatening process. However, more recently a cross-tenure feral pig management strategy has been prepared for

nearby areas such as Everlasting Swamp which includes strategies specific to relevant NPWS reserves. A similar approach would benefit the planning area.

Wild dogs including dingos

Wild dogs are known to occur within the planning area. Wild dogs, including dingos, are a declared pest under the LLS Act due to their impacts on livestock. NPWS therefore has a statutory obligation to control wild dogs on its estate. The dingo, however, is also considered to be part of the native fauna of New South Wales and certain areas of public land that provide high quality dingo habitat have been listed as dingo management areas in Schedule 2 of the Wild Dog Pest Control Order made under the LLS Act.

Mount Neville Nature Reserve, Banyabba Nature Reserve, Fortis Creek National Park and Banyabba State Conservation Area are listed as dingo management areas. Under the LLS Act, wild dog control activities in areas of high quality dingo habitat must be guided by a wild dog management plan that addresses both control and conservation objectives. Strategic and reactive wild dog control programs will therefore be undertaken in accordance with the regional wild dog management plan (North Coast LHPA 2011) and the regional pest management strategy.

Foxes

The European red fox occurs in scattered populations throughout the planning area. Foxes suppress native animal populations, particularly medium-sized ground-dwelling and semi-arboreal mammals, ground-nesting birds and freshwater turtles. Foxes have also been implicated in the spread of a number of weed species such as blackberry (*Rubus fruticosus* agg.), and are known to prey on domestic stock, including lambs and poultry. They are a declared pest under the LLS Act.

Predation by the European red fox is listed as a key threatening process under the TSC Act and EPBC Act (NSW SC 1998; DoE 2009). The *NSW Threat Abatement Plan for Predation by the Red Fox* was initiated in 2001 (and revised in 2010) with the primary objective of establishing long-term control programs to protect priority threatened animal species and populations. In accordance with the plan, foxes are being controlled at priority sites across New South Wales to protect biodiversity. There are no priority sites within the planning area.

Cattle

Domestic cattle from adjacent pastoral lands occasionally stray into parts of the planning area. Cattle damage the values of the planning area by grazing and trampling native vegetation, competing with native animals for food, contributing to the spread of weeds along trails and around creeks, and increasing creek bank erosion and sedimentation. Cattle have been recorded in the north-east of Banyabba Nature Reserve, in the Cabbage Tree Creek area of Mount Neville Nature Reserve, and along trails and spurs in Mount Pikapene and Fortis Creek national parks (NPWS 2002a).

NPWS has a policy of encouraging the construction and maintenance of boundary fences to exclude stock from parks, and may provide fencing assistance to establish effective fences. NPWS may also approve the use of horses to muster and remove stock on a case-by-case basis.

Dieback

Phytophthora cinnamomi dieback

Dieback caused by the root-rot fungus *Phytophthora cinnamomi* is listed as a key threatening process under the TSC Act and the EPBC Act (NSW SC 2002; DoE 2009). *Phytophthora cinnamomi* is an introduced soil-borne pathogen which infects a large range of plant species and in some circumstances may contribute to plant death where there are other stresses present, such as waterlogging, drought and perhaps wildfire (NSW SC 2002). The pathogen

may be dispersed in water flowing from infected roots to the roots of healthy plants as well as by mud clinging to vehicles, animals and walkers.

Phytophthora has been detected elsewhere in the district and poses a threat to the unique flora of the Kangaroo Creek Sandstone area. It is most likely to be transmitted to the planning area via vehicles, including management vehicles. Hygiene precautions for personnel, vehicles and machinery are a particular priority to prevent phytophthora from entering the planning area. These procedures will also reduce the likelihood of weed species being introduced into the planning area.

Bell miner associated dieback

Over-abundant populations of native bell miners (*Manorina melanophrys*) appear to be associated with a form of eucalypt dieback which has been listed as a key threatening process under the TSC Act (NSW SC 2008). Bell miner associated dieback (BMAD) is currently spreading rapidly through sclerophyll forests in New South Wales and is likely to occur in the planning area.

BMAD is generally characterised by trees that are stressed and dying in response to high populations of psyllids and other sap-sucking insects, the presence of bell miners and the alteration of the forest structure (with depleted canopy and mid-storeys, and replacement of understoreys with dense shrubby vegetation, often dominated by lantana or vine thickets). The bell miners drive away insectivorous birds that would otherwise help to control insect numbers.

Weed invasion, drought, logging, soil nutrient changes, and poor fire and grazing regimes have also been implicated in the spread of BMAD (BMAD Working Group 2004).

In the Northern Rivers Region, control priorities are currently limited to identifying the presence of BMAD and assessing its impact at particular sites. Where the impact is significant, or could potentially become significant, site management plans will be prepared. Current operational activities to prevent spread and assist with ecosystem recovery include weed control and fire management.

Desired outcomes

- Pest plants, animals and pathogens are controlled and where possible eliminated.
- Negative impacts of introduced species on park values are minimised.

Management response

- 4.1.1 Manage pest species in accordance with the regional pest management strategy and other strategies as relevant.
- 4.1.2 Exclude non-native grazing stock from the parks by liaising with neighbouring landholders, removing stock, and providing assistance in accordance with NPWS policy where necessary.
- 4.1.3 Undertake the following tasks to restore the Cabbage Tree Creek area of Mount Neville Nature Reserve to a more natural state:
 - determine the most appropriate method for removal of slash pine from the Cabbage Tree Creek area and prepare appropriate harvesting and extraction plans
 - prior to removal of the slash pines, prepare a rehabilitation plan for the revegetation of the area with native species
 - undertake harvesting of pines, with follow-up eradication of the residual pine population
 - undertake rehabilitation works for the area following the harvesting operation.

- 4.1.4 Implement appropriate hygiene precautions for personnel, vehicles and machinery entering the planning area to reduce the spread or introduction of pathogens and weeds.
- 4.1.5 Undertake an assessment to determine whether BMAD occurs in the planning area. If BMAD is found to occur, assess and map the extent and significance of the dieback. (Prepare site management plans where the impact is determined to be significant or could potentially become significant.)
- 4.1.6 Prepare a feral pig management strategy for Kooyong State Conservation Area and other areas where warranted by impacts from feral pigs.
- 4.1.7 Undertake strategic and reactive wild dog control programs in accordance with the wild dog management plan and the regional pest management strategy.
- 4.1.8 Encourage research into the distribution, abundance and impact of introduced species on native species and habitats within the planning area and best practice control methods, including chemical and biological pest control.

4.2 Fire

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

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

A relatively high number of wildfires, affecting large portions of the planning area, have occurred since the late 1970s. Many of these fires were lit off-park and moved onto the parks under adverse weather conditions. In addition, under previous tenure, much of the planning area was used for grazing. Graziers used fire to burn off grass to create a 'green pick' during the spring months. This annual burning practice has simplified or reduced the biodiversity of the understorey, damaging the ecological values of the reserve system. Additionally, the practice of spring burning is complicated by the potential of fires lit in late winter to reignite under the influence of hot north-westerly winds, which are commonly experienced in August and early spring. These reignitions can result in intense fires that burn over large areas.

The majority of the planning area is surrounded by timbered areas used for beef cattle production. Parts of the planning area are adjacent to timber production areas managed by Forestry Corporation of NSW (FCNSW) and private operators. The protection of these assets as well as those of the planning area requires a cooperative approach to fire management by NPWS, FCNSW, other agencies and adjacent landholders.

Fire management strategies have been prepared for the reserves in the planning area (NPWS 2006a, 2006b, 2006c, 2007). Together, these strategies outline the recent fire history of the planning area, key assets within and adjoining the planning area (including sites of natural and cultural heritage value), fire management zones and fire control advantages such as management trails and water supply points. The strategies also contain fire regime guidelines for conservation of the planning area's vegetation communities. Fire management will focus on establishing working relationships with adjacent landholders. Cooperative burning programs will be used to provide a fuel-reduced buffer between the planning area and adjacent lands.

Given the rugged topography of the planning area, fires under the influence of hot, dry and windy conditions tend to be large. With the exception of some of the rainforest vegetation in Mount Pikapene National Park, few natural fire advantages exist to limit the run of wildfire within the planning area. Fire management will focus on creating strategic wildfire control zones using existing management trails, and prescribed burning to create fuel-reduced buffers adjacent to these trails. These zones may be burnt more frequently than that normally prescribed for maintenance of the natural biodiversity in order to maintain a reduced fuel load, which will assist fire control and limit the size of wildfire in the planning area. In undertaking these operations, consideration will be given to the requirements of threatened species and species of conservation concern.

Given the high frequency of fire within the planning area and the need for out-of-area or non-local assistance to combat these fires, adequate trail signposting is essential to provide direction to firefighting personnel and to assist their safe access to and egress from fire grounds, particularly during night operations. Directional signage naming management trails and denoting other important features such as water points has been provided throughout the planning area, including at trail junctions within the Banyabba Wilderness (see Section 5.1).

NPWS maintains cooperative arrangements with surrounding landowners and the Rural Fire Service and is actively involved with the Clarence Valley and Northern Rivers bush fire management committees. Cooperative arrangements include fire planning, fuel management and information sharing. Hazard reduction programs, ecological burning proposals and fire trail works are submitted annually to the relevant bush fire management committees.

Desired outcomes

- Negative impacts of fire on life, property and the environment are minimised.
- The potential for spread of bushfires on, from, or into the planning area is minimised.
- Fire regimes are appropriate for conservation of native plant and animal communities.
- Aboriginal sites, artefacts and historic remnants are protected from the impact of fire and fire-related management activities.

Management response

- 4.2.1 Implement the fire management strategies for the planning area, and review and update them as necessary to ensure appropriate levels of fire preparedness.
- 4.2.2 Continue to be involved in the Clarence Valley and Northern Rivers bush fire management committees and maintain cooperative arrangements with local Rural Fire Service brigades and other fire authorities and surrounding landowners in regard to fuel management and fire suppression.
- 4.2.3 Encourage research into fire behaviour, hazard and risk assessment, and the fire requirements of vegetation communities, native animals and significant plant species for ongoing input into fire management strategies.

4.3 Climate change

Human-induced climate change is listed as a key threatening process under the TSC Act (NSW SC 2000a) and the associated loss of habitat is listed under the EPBC Act (TSSC 2001a).

The latest information on projected changes to climate are from the NSW and ACT Regional Climate Modelling (NARClm) project (OEH 2014a). The climate projections for 2020–39 are described as ‘near future’; and projections for 2060–79 are described as ‘far future’. The snapshot shown in Table 3 is for the North Coast Region which includes the planning area (OEH 2014a).

Table 3: North Coast climate change snapshot

Projected temperature changes	
Maximum temperatures are projected to increase in the near future by 0.4–1.0°C	Maximum temperatures are projected to increase in the far future by 1.5–2.4°C
Minimum temperatures are projected to increase in the near future by 0.5–1.0°C	Minimum temperatures are projected to increase in the far future by 1.6–2.5°C
The number of hot days will increase	The number of cold nights will decrease
Projected rainfall changes	
Rainfall is projected to decrease in winter	Rainfall is projected to increase in spring and autumn
Projected Forest Fire Danger Index changes	
Average fire weather is projected to increase during summer and spring	Severe fire weather days are projected to increase in summer and spring

Source: OEH 2014a.

The projected increases in temperature, number of hot days and severe fire weather days (OEH 2014a) are likely to influence bushfire frequency and intensity across the North Coast Region and result in an earlier start to the bushfire season (DECCW 2010). Higher summer rainfall and rainfall intensity in the region are likely to increase sheet and rill erosion on the steeper slopes of the hinterland. Expected declines in run-off in spring and winter are likely to reduce seepage flows and hence activity of some forms of gully erosion, although this change will be offset where stabilising vegetation declines. Higher summer and autumn rainfalls are likely to increase the risk of mass movement in all currently vulnerable slopes in the hinterlands, but negative water balances may offset this effect through reduced water content in soil profiles (DECCW 2010).

Climate change may significantly affect biodiversity by changing the size of populations and the distribution of species, and altering the geographical extent and species composition of habitats and ecosystems. Species most at risk are those unable to migrate or adapt, particularly those with small population sizes or with slow growth rates.

The potential impact of climate change on the planning area is difficult to assess since it depends on the compounding effects of other pressures, particularly barriers to migration and pressure from introduced animals. If fire extent increases under future conditions of increased fire danger, however, fire-sensitive ecosystems such as dry rainforest could undergo structural and compositional changes. Changes in the fire regime are likely to compound the impacts of other climatic changes; for instance, disturbance by fire together with an increase in summer rainfall is likely to benefit weeds such as lantana (DECCW 2010).

Highly cleared and fragmented ecosystems such as lowland rainforests are likely to be at greater risk than more intact ecosystems. In these areas in particular, warmer temperatures are likely to worsen weed infestations. Weeds, such as lantana, can replace native species as a major food source for seed dispersers such as fruit-eating birds, thereby facilitating weed invasion. Low-lying subtropical rainforest such as that at Wombat Creek State Conservation Area and Mount Neville Nature Reserve is likely to undergo further structural change, functional disruption and reduced species diversity (DECCW 2010).

NPWS will continue to manage threats to park values from climate change in a collaborative way with other land managers. The presence of the parks of the Southern Richmond Range planning area will improve the resilience of natural and cultural values along the whole corridor through the protection of native flora and fauna (DECCW 2010).

Furthermore, programs to reduce the pressures arising from other threats, such as invasive species and bushfires, will also help reduce the severity of the effects of climate change.

Desired outcomes

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

Management response

- 4.3.1 Continue existing fire, pest and weed management programs to increase the planning area's ability to cope with future disturbances, including climate change (see Sections 4.1 and 4.2).

5 Management operations and other uses

5.1 NPWS management facilities and operations

Roads and trails

The network of management trails in the planning area is regularly used for fire management and other operational activities. In accordance with NPWS policy, vehicle use of management trails is only available for NPWS and authorised activities, mostly associated with essential reserve management. Use of management trails by the public is generally limited to bushwalking and cycling (see Section 3.6).

The planning area includes a number of 'ministerial roads', listed in Table 4. The management of these roads is vested with the Minister administering the NPW Act. This ensures the continuation of access arrangements that existed immediately before reservation of the parks, such as timber hauling from the adjoining state forest and access to private property. NPWS will contribute to the management of these roads. Any modification or upgrade of a ministerial road will only be permitted under the terms of a formal access agreement such as a licence.

While ministerial roads do not form part of the reserved park area, they are subject to the provisions of this plan and the NPW Regulation. The specific purpose of each ministerial road in the planning area is given in Table 4. Where this purpose is solely for access for FCNSW, it does not need to include public access. Where the purpose is for private property access, pets and livestock may be transported by vehicle provided they are en route to the private property and remain in the vehicle.

Morgans Camp Trail, originally excluded from Fortis Creek National Park to facilitate access to a private property inholding, is no longer required for this purpose and will be reserved as part of the park. This road will not be available for public vehicle use because it lies within the Banyabba Wilderness.

Several road reserves occur within the planning area in Fortis Creek National Park; Banyabba and Mount Neville nature reserves; and Corymbia, Gurrang and Kooyong state conservation areas. These road reserves do not have built roads and are unlikely to be required for future public use as they generally serve only to access undeveloped parts of surrounding NPWS parks or are duplicated by constructed roads. These road reserves do not form part of the planning area. Likewise, a Crown reserve along the course of Whitemans Creek, in the north-west section of Banyabba Nature Reserve, is not part of the planning area.

Much of the route of Swallow Road in Fortis Creek National Park, the eastern part of Mount Neville Trail in Mount Neville Nature Reserve and sections of Coaldale Trail in Banyabba Nature Reserve coincide with public road reserves. NPWS will work with Department of Primary Industries – Lands (DPI Lands) and other relevant parties to determine whether they could be added to the surrounding reserve and designated as management trails.

The Lardner-Banyabba Link Trail, located on the northern boundary of Banyabba Nature Reserve and on the boundary of the Banyabba Wilderness provides a strategic east–west link, which is important for fire management purposes. Sections of the trail traverse particularly steep terrain that is prone to erosion. Specific major drainage and sheeting works have been carried out to upgrade and stabilise the trail and allow its continued use for fire management purposes.

As discussed in Section 3.6, vehicle access for NPWS to parts of the planning area relies on trails across private property. NPWS access arrangements are subject to agreements negotiated with the relevant property owner.

Table 4: Ministerial roads to be retained in the planning area

Park	Road/trail name*	Access type	Reservation purpose^
Banyabba Nature Reserve	Mount Marsh Road	Management trail	Access for FCNSW
Corymbia State Conservation Area	Corymbia Road	Park road	Private property access
	Wongabeena Road (part only ⁺)	Park road (east) Neighbour access trail (west)	Private property access
Gurranang State Conservation Area	Khan Trail	Neighbour access trail	Private property access
Kooyong State Conservation Area	Oil Rig Road	Park road (4WD)	Access for FCNSW
Lawrence Road State Conservation Area	Parallel Trail	Neighbour access trail	Private property access
Mount Neville Nature Reserve	Carrawarra Ridge Trail	Management trail	Access for FCNSW
Mount Pikapene National Park	Tower Road	Management trail / neighbour access trail	Private property access (including to fire lookout by authorised users)
	Sugarloaf Road	Management trail	Access for FCNSW. Also private property access (including to fire lookout by authorised users)
	Forty Acres Road	Park road	Access for FCNSW
	Pikapene Trail	Management trail	Access for FCNSW
	Coffee Creek Road	Park road (4WD)	Access for FCNSW
Wombat Creek State Conservation Area	Wombat Creek Trail	Neighbour access trail	Private property access

* All roads and trails in Banyabba SCA, Corymbia SCA, Gurranang SCA, Kooyong SCA, Lawrence Road SCA, Mount Pikapene SCA and Wombat Creek SCA are currently ministerial roads. Morgans Creek Trail in Fortis Creek NP is also currently a ministerial road.

^ 'Access for FCNSW' includes staff of Forestry Corporation of NSW or those authorised by Forestry Corporation of NSW for management/harvesting purposes on nearby areas of state forest.

+ Middle section of Wongabeena Road coincides with a public road reserve and hence is not a ministerial road.

Past disturbance

Approximately 15 hectares of the 40-hectare Morgans Camp property in Fortis Creek National Park were previously cleared for grazing, and two dams were constructed. One dam is in good repair and will be retained for use in fire management. The second dam, closer to the former house site, is in very poor condition and will not be maintained. This site may require rehabilitation to prevent further erosion. The former clearings will be allowed to regenerate back to forested land.

Parts of the addition to Mount Neville Nature Reserve in the Six Mile Swamp valley were also cleared for grazing. This is slowly regenerating, primarily through natural regrowth. The site of

an old cattle dip site and its associated yards is located on this land next to Benders Dip Trail. Based on information retrieved from a laboratory log maintained by the Department of Agriculture (now part of the Department of Primary Industries and known as DPI Agriculture), arsenic was first used at this dip in 1947 and the insecticide dichlorodiphenyltrichloroethane (DDT) was used between 1960 and 1962. It is likely that the dip bath, its surrounds and the adjacent draining yard are contaminated with residues of these chemicals (McDougall 1997). The hazard associated with former dips may be contained via capping or fencing the site.

A number of quarries exist in the planning area. The largest of these are located in Fortis Creek National Park, near the southern end of Morgans Camp Trail and on Dilkoon Trail as shown on Figure 3. Stockpiles of material obtained from these quarries are progressively being used for road maintenance within the planning area. The registration of these quarries has expired, however, NPWS is considering re-registering them to permit future extraction to assist in supplying gravel for the maintenance of the planning area's trail network. Once the quarries' gravel resources are exhausted, they will be shaped to restore a more natural landscape and rehabilitated. Consistent with wilderness management principles, the former quarry on Morgans Camp Trail will be a priority for rehabilitation works.

Several parts of the planning area have been subject to illegal timber harvesting operations, the most recent occurrence in 2006. Good boundary fencing can reduce the potential for future unintentional incursions, as well as grazing domestic livestock (see Section 4.1).

Desired outcomes

- A safe and effective strategic trail network is maintained for management purposes.
- Previously disturbed areas, such as areas cleared for grazing, trails and quarries, are rehabilitated.
- Infrastructure within the planning area is appropriate for management requirements.

Management response

Roads and trails

- 5.1.1 Maintain park roads and management trails (as shown on Figures 2, 3 and 4) to a dry weather four-wheel drive standard except as otherwise indicated. Trails will be signposted to provide direction, and gates or bollards installed where necessary to prevent unauthorised vehicle access to management trails and the Banyabba Wilderness.
- 5.1.2 Close trails within the planning area not shown on Figures 2, 3 or 4 or no longer required for management purposes and allow them to regenerate naturally. Undertake supplementary erosion control or rehabilitation works as required.
- 5.1.3 Pursue reservation of Morgans Camp Trail, and other ministerial roads no longer required for access to adjacent private property or state forest, as additions to the surrounding park.
- 5.1.4 Should a neighbour access trail no longer provide the only practical means of access to private property, either close it or manage it as a management trail.
- 5.1.5 In consultation with DPI Lands and councils (where relevant), seek the formal closure of public road reserves (other than Ramornie Street in Gurrang State Conservation Area) that lie within the planning area, and their subsequent reservation as additions to the planning area.
- 5.1.6 Seek the transfer of the Crown reserve along Whitemans Creek to Banyabba Nature Reserve and the Banyabba Wilderness.

- 5.1.7 Where public road access to the planning area does not exist, negotiate arrangements for management access with relevant neighbours.

Past disturbance

- 5.1.8 Allow and encourage disturbed areas, such as areas cleared for grazing, to naturally regenerate. Supplement natural regeneration with weed control, site preparation and rehabilitation programs using local genetic stock where necessary. Give priority to the rehabilitation of the larger areas cleared for grazing, erosion gullies and the area of introduced pines within Mount Neville Nature Reserve (see Section 4.1).
- 5.1.9 Maintain the large dam at Morgans Camp within Fortis Creek National Park for fire management purposes. Allow and encourage natural regeneration of the smaller dam.
- 5.1.10 In liaison with DPI Agriculture, assess the contamination hazard of Benders Dip and implement appropriate control measures such as fencing and capping.
- 5.1.11 In liaison with NSW Department of Industry – Resources and Energy, register the two existing quarries in Fortis Creek National Park, prepare quarry management plans and, consistent with these plans, extract gravel from within the existing zone of disturbance for road maintenance within the planning area.
- 5.1.12 Once a quarry's resources are exhausted, progressively rehabilitate the site using local soils and plants from local genetic stock.

5.2 Non-NPWS management facilities and operations

There are a number of non-NPWS land uses in the planning area that pre-date reservation of the parks. These non-NPWS uses are classified as 'existing interests' under section 39 of the NPW Act if they were legally approved immediately prior to reservation. At the time of reservation, existing interests in the planning area included apiary sites, the Dilkoon Rural Fire Brigade Station, electricity transmission lines and trigonometrical ('trig') stations.

Apiary sites

Apiary sites within the planning area include two sites in Banyabba State Conservation Area, three sites in Corymbia State Conservation Area, three sites in Mount Pikapene National Park and nine sites in Fortis Creek National Park. Apiary sites within the Banyabba Wilderness Area have been relocated outside the wilderness area in consultation with the licensees. NPWS policy allows existing sites to continue but does not allow any new or additional sites.

Apiary sites in the planning area are limited in size and maintained by mowing or slashing. Access to apiary sites is via roads and management trails. While no problems are currently known in the planning area, the European honeybee (*Apis mellifera*) can have adverse impacts on some native plants and animals (Paton 1996). Impacts include poor flower pollination and competition with native nectar feeders, and hive sites may cause unacceptable environmental impacts or user conflicts. Where needed, NPWS will aim to negotiate relocation of hives to allow the closure of trails or minimise the impact of the honeybees.

Dilkoon Rural Fire Brigade Station

The Dilkoon Rural Fire Brigade Station is located in Fortis Creek National Park on the corner of Dilkoon Trail and the Summerland Way (see Map 3). It was constructed while the area was still state forest, under the terms of an occupation permit issued by the then Forestry Commission of NSW. In 2008, this occupation was formalised by a licence under section 151 of the NPW Act between NPWS and Clarence Valley Council.

Transmission lines

There are several powerlines in the planning area, including two corridors for major transmission lines shown on Figure 3. TransGrid's 330-kilovolt line traverses Fortis Creek National Park and Banyabba and Corymbia state conservation areas via the western corridor. TransGrid's 132-kilovolt line and Essential Energy's 66-kilovolt line lie on the eastern corridor which traverses part of Fortis Creek National Park and Corymbia State Conservation Area. The corridors for the lines through Corymbia State Conservation Area have been retained as Crown land and are not reserved as part of the planning area.

In addition, there are two local lines maintained by Essential Energy which traverse parts of the planning area. The line along Stockyard Creek Road enters part of Fortis Creek National Park and the line along the Summerland Way enters part of Gurrang State Conservation Area.

Transmission lines and associated developments generate impacts from clearing or trimming of vegetation, use of herbicides and the maintenance of access trails, as well as the visual impact of the lines and towers. This infrastructure needs to be managed to minimise impacts on natural and cultural values, scenic values and NPWS infrastructure. A statewide agreement between TransGrid and NPWS for inspection and maintenance of existing transmission lines and infrastructure is in place.

Easements are in place for the major high-voltage lines but not for the smaller local powerlines. However, in accordance with the *Electricity Supply Act 1995*, a network operator can operate and use the existing powerlines regardless of whether a formal easement exists, but the company must comply with the NPW Act and Regulation when carrying out any maintenance or replacement work, and will require NPWS consent for certain works.

Trig stations

Two trigonometric (trig) stations are located within the planning area:

- Neville (TS3365), located on Mount Neville in Mount Neville Nature Reserve
- Marsh (TS2991), located on Mount Marsh in Banyabba Nature Reserve.

An agreement between NPWS and the former Central Mapping Authority (now Land and Property Information (LPI), part of the NSW Office of Finance and Services) provides for continued right of access to the trig stations for survey purposes, subject to environmental impact assessment. Neither site is accessible by vehicle.

Mining and exploration

As described in Section 2.2, the tenure of state conservation areas allows for uses permitted under section 47J of the NPW Act, including mineral exploration and mining. The state conservation areas in the planning area have been covered by a number of exploration licences since reservation (DECC 2008; OEH 2014b).

The Department of Industry – Resources and Energy is the lead authority for mining and mineral exploration, and is required under the EPA Act to undertake environmental assessments for mining and exploration activities in the state conservation areas. The existing memorandum of understanding between NPWS and the former Department of Mineral Resources describes the management and consultative arrangements associated with exploration and mining in state conservation areas.

While exploration licences and assessment leases may be granted within state conservation areas without the concurrence of the Minister administering the NPW Act, the Minister's approval must be obtained before any rights under that lease or licence can be exercised.

Desired outcomes

- Non-NPWS uses and activities are managed to minimise impacts on the planning area's natural, cultural and scenic values.

Management response

- 5.2.1 Continue to authorise and manage apiary sites in accordance with NPWS policy and consent conditions.
- 5.2.2 Continue to permit vegetation management along powerline corridors and other maintenance works subject to conditions to minimise impacts on park values.
- 5.2.3 Authorised access for use and maintenance of the trig stations will be permitted under existing or future formal agreements between NPWS and LPI.
- 5.2.4 Monitor non-NPWS uses annually to ensure compliance with relevant licences, leases, easements, formal agreements and NPWS policy.
- 5.2.5 Ensure that applications for mining or mineral exploration in the state conservation areas are subject to environmental assessment in accordance with the current memorandum of understanding or future agreements with the Department of Industry.

6 Implementation

This plan of management establishes a scheme of operations for the planning area. Implementation of this plan will be undertaken within the annual work program of the NPWS Northern Rivers Region.

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

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

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

Table 5: List of management responses

	Management response	Priority
3.1	Geology, landscape and hydrology	
3.1.1	Manage pest species, fire, roads and trails and areas of past disturbance to minimise erosion and maintain/encourage protective vegetation cover	High/ Ongoing
3.2	Native plants	
3.2.1	Support the identification and implementation of recovery actions for threatened species, populations and ecological communities occurring in the planning area.	High/ Ongoing
3.2.2	Establish a rare, threatened and significant flora marker system to protect roadside specimens from damage during field operations. If necessary, erect fencing or other barriers to protect roadside populations from damage.	High
3.2.3	Manage fire regimes in accordance with known fire frequency thresholds for vegetation species and communities, with particular attention to the protection of significant flora.	High/ Ongoing
3.2.4	Encourage research into the distribution, ecological requirements and management requirements of native species recorded in the planning area, with particular emphasis on threatened or restricted species and those most susceptible to impact from fire and introduced species.	Medium
3.2.5	Encourage preparation of a vegetation map based on one vegetation classification system, of appropriate detail to guide management, using existing studies and conducting further flora surveys as required.	Medium
3.3	Native animals	
3.3.1	Support the identification and implementation of recovery actions for threatened species, populations and ecological communities occurring in the planning area.	High

	Management response	Priority
3.3.2	Encourage research into the distribution, ecological requirements and management requirements of native species recorded in the planning area, with particular emphasis on threatened or restricted species and those most susceptible to impact from fire and introduced species.	Medium
3.4	Aboriginal heritage	
3.4.1	Consult and involve the Bandjalang and Western Bundjalung peoples, other relevant Aboriginal community organisations and custodial families in the management of their Country, including the management of Aboriginal sites, and cultural and natural values. This will include implementation of any negotiated Indigenous Land Use Agreement or other joint management arrangements.	High/ Ongoing
3.4.2	Inspect and record the condition of significant Aboriginal art shelter sites every 3 years and undertake protective works as necessary.	High
3.4.3	Encourage further research and surveys into the identification of Aboriginal sites, places and other values with the involvement of the Aboriginal community.	Medium
3.5	Historic heritage	
3.5.1	Record, assess and manage sites of early European occupation in accordance with their assessed level of significance.	Medium
3.5.2	Protect and where appropriate interpret historic sites identified as having significant cultural or historic value. In particular, retain the tick fence on the planning area's boundary where it serves a management purpose and maintain it in the character of the original fence. The wire of other sections may be removed to reduce the hazard to native animals.	Low
3.5.3	Encourage research into early European use and historic sites in the planning area.	Low
3.6	Visitor use	
3.6.1	Allow public vehicle access, including access by registered trail bikes, on the public roads and neighbour access trails in the planning area as listed in Table 2 and shown on Figures 2, 3 and 4. Access may be restricted during periods of wet weather or if the neighbour access trails are no longer essential for neighbour access. Prohibit public vehicle access on management trails.	High/ Ongoing
3.6.2	If required due to usage levels, create a vehicle parking and turn-around area at the intersection of the Dilkoon and Centre trails, and promote this to visitors to the Banyabba Wilderness.	Medium
3.6.3	Allow bush camping within Mount Neville Nature Reserve, Banyabba Nature Reserve, Banyabba State Conservation Area, Fortis Creek National Park and Mount Pikapene National Park at distances more than 1 kilometre from a park road or a public road, more than 500 metres from a boundary with private property, and more than 20 metres from a watercourse. No facilities will be provided.	Ongoing
3.6.4	Encourage bushwalking throughout the planning area, primarily using the management trail network.	Ongoing
3.6.5	Allow cycling on park roads and management trails in the planning area. Monitor usage and impacts of cycling. Review cycling access if necessary to reduce impacts on the planning area's values. This may include closure of specific management trails to cycling during wet conditions and the implementation of appropriate hygiene precautions to reduce the spread or introduction of pathogens and weeds.	Medium/ Ongoing

	Management response	Priority
3.6.6	Allow horse riding on Kimbin Pikapene Road and Gurrangang Railway Station Road, and on neighbour access trails to access private property with permission.	High/ Ongoing
3.6.7	Investigate horse riding opportunities, depending on demand, on trails in the following reserves: <ul style="list-style-type: none"> - Banyabba State Conservation Area: Ogilvie Trail, Saltwater Creek Trail and Back Forest Road, and other trails. - Fortis Creek National Park: Dilkoon Trail (outside of wilderness only), and Dove, Swallow, Short Cut and Corbetts Waterhole trails to create a small loop ride. Further investigation is also needed to assess the potential environmental impacts on other trails including Robin Trail. - Kooyong State Conservation Area: Oil Well Road and Needlebark Trail. - Mount Pikapene National Park: Keembin Creek, Forty Acres Road, and Tainsh. <p>Any investigation requires special consideration of potential impacts on threatened species and soils. Should horse riding be allowed, it is likely that provisions will be applied that exclude use during wet conditions.</p>	Medium
3.6.8	Visitor group size limits apply within the planning area except with written consent from NPWS. Group sizes are limited to 15 persons within the Banyabba Wilderness, and 20 persons within the planning area outside of the Banyabba Wilderness.	Ongoing
3.7	Information and education	
3.7.1	Install an interpretive display on the values of Fortis Creek National Park, Banyabba Nature Reserve and the Banyabba Wilderness at the intersection of the Dilkoon Trail and the Summerland Way.	Low
3.7.2	Erect signage at the boundary of the Banyabba Wilderness on Banyabba Trail, Saltwater Trail, Dilkoon Trail, Fortis Creek Trail, Junction Creek Trail and Morgans Camp Trail and other boundary locations as required, identifying the activities that may and may not occur in the Banyabba Wilderness.	High
4.1	Pests	
4.1.1	Manage pest species in accordance with the regional pest management strategy and other strategies as relevant.	High/ Ongoing
4.1.2	Exclude non-native grazing stock from the parks by liaising with neighbouring landholders, removing stock, and providing assistance in accordance with NPWS policy where necessary.	High/ Ongoing
4.1.3	Undertake the following tasks to restore the Cabbage Tree Creek area of Mount Neville Nature Reserve to a more natural state: <ul style="list-style-type: none"> - determine the most appropriate method for removal of slash pine from the Cabbage Tree Creek area and prepare appropriate harvesting and extraction plans - prior to removal of the slash pines, prepare a rehabilitation plan for the revegetation of the area with native species - undertake harvesting of pines, with follow-up eradication of the residual pine population - undertake rehabilitation works for the area following the harvesting operation. 	High
4.1.4	Implement appropriate hygiene precautions for personnel, vehicles and machinery entering the planning area to reduce the spread or introduction of pathogens and weeds.	Medium

	Management response	Priority
4.1.5	Undertake an assessment to determine whether BMAD occurs in the planning area. If BMAD is found to occur, assess and map the extent and significance of the dieback. (Prepare site management plans where the impact is determined to be significant or could potentially become significant.)	Medium
4.1.6	Prepare a feral pig management strategy for Kooyong State Conservation Area and other areas where warranted by impacts from feral pigs.	Medium
4.1.7	Undertake strategic and reactive wild dog control programs in accordance with the North Coast Local Land Services wild dog management plan and the regional pest management strategy.	High
4.1.8	Encourage research into the distribution, abundance and impact of introduced species on native species and habitats within the planning area and best practice control methods, including chemical and biological pest control.	Medium
4.2	Fire	
4.2.1	Implement the fire management strategies for the planning area, and review and update them as necessary to ensure appropriate levels of fire preparedness.	High
4.2.2	Continue to be involved in the Clarence Valley and Northern Rivers bush fire management committees and maintain cooperative arrangements with local Rural Fire Service brigades and other fire authorities and surrounding landowners in regard to fuel management and fire suppression.	High
4.2.3	Encourage research into fire behaviour, hazard and risk assessment, and the fire requirements of vegetation communities, native animals and significant plant species for ongoing input to fire management strategies.	Medium
4.3	Climate change	
4.3.1	Continue existing fire, pest and weed management programs to increase the planning area's ability to cope with future disturbances, including climate change.	Ongoing
5.1	NPWS management facilities and operations	
5.1.1	Maintain park roads and management trails (as shown on Figures 2, 3 and 4) to a dry weather four-wheel drive standard except as otherwise marked thereon. Trails will be signposted to provide direction, and gates or bollards installed where necessary to prevent unauthorised vehicle access to management trails and the Banyabba Wilderness.	High
5.1.2	Close trails within the planning area not shown on Figures 2, 3 or 4 or no longer required for management purposes and allow them to regenerate naturally. Undertake supplementary erosion control or rehabilitation works as required.	Medium
5.1.3	Pursue reservation of Morgans Camp Trail, and other ministerial roads no longer required for access to adjacent private property or state forest, as additions to the surrounding park.	Medium
5.1.4	Should a neighbour access trail no longer provide the only practical means of access to private property, either close it or manage it as a management trail.	Low
5.1.5	In consultation with DPI Lands and councils (where relevant), seek the formal closure of public road reserves (other than Ramornie Street in Gurrang State Conservation Area) that lie within the planning area, and their subsequent reservation as additions to the planning area.	Low
5.1.6	Seek the transfer of the Crown reserve along Whitemans Creek to Banyabba Nature Reserve and the Banyabba Wilderness.	Medium

	Management response	Priority
5.1.7	Where public road access to the planning area does not exist, negotiate arrangements for management access with relevant neighbours.	Medium
5.1.8	Allow and encourage disturbed areas, such as areas cleared for grazing, to naturally regenerate. Supplement natural regeneration with weed control, site preparation and rehabilitation programs using local genetic stock where necessary. Give priority to the rehabilitation of the larger areas cleared for grazing, erosion gullies and the area of introduced pines within Mount Neville Nature Reserve.	Medium
5.1.9	Maintain the large dam at Morgans Camp within Fortis Creek National Park for fire management purposes. Allow and encourage natural regeneration of the smaller dam.	High
5.1.10	In liaison with DPI Agriculture, assess the contamination hazard of Benders Dip and implement appropriate control measures such as fencing and capping.	High
5.1.11	In liaison with NSW Department of Industry – Resources and Energy, register the existing quarries in Fortis Creek National Park, prepare quarry management plans and, consistent with these plans, extract gravel from within the existing zone of disturbance for road maintenance within the planning area.	Medium
5.1.12	Once a quarry's resources are exhausted, progressively rehabilitate the site using local soils and plants from local genetic stock.	Low
5.2	Non-NPWS management facilities and operations	
5.2.1	Continue to authorise and manage apiary sites in accordance with NPWS policy and consent conditions.	Ongoing
5.2.2	Continue to permit vegetation management along powerline corridors and other maintenance works subject to conditions to minimise impacts on park values.	Ongoing
5.2.3	Authorise access for use and maintenance of the trig stations under existing or future formal agreements between NPWS and LPI.	Ongoing
5.2.4	Monitor non-NPWS uses annually to ensure compliance with relevant licences, leases, easements, formal agreements and NPWS policy.	Medium
5.2.5	Ensure that applications for mining or mineral exploration in the state conservation areas are subject to environmental assessment in accordance with the current memorandum of understanding or future agreements with the Department of Industry.	Ongoing

References

- BMAD Working Group 2004, *Bell Miner Associated Dieback Strategy*, Bell Miner Associated Dieback Working Group.
- Biosecurity Queensland on behalf of the National Lantana Management Group 2010, *Plan to Protect Environmental Assets from Lantana*, Department of Employment, Economic Development and Innovation, Yeerongpilly, Queensland.
- Briggs JD & Leigh JH 1996, *Rare or Threatened Australian Plants*, revised edition, CSIRO, Melbourne.
- Byrne D 1987, The Aboriginal and Archaeological Significance of the New South Wales Rainforests, Cited in Margules Groome Pöyry Pty Ltd. 1994, *Environmental Impact Statement: Proposed forestry operations, Grafton Management Area, Volume A - Main report*, State Forests of NSW.
- Clancy GP 1998, *Fauna Survey of Mt Neville Nature Reserve*, report commissioned by the NPWS, Grafton District.
- Coles GS 1980, Vegetation ecology of the Clarence-Moreton Basin with special reference to Kangaroo Creek Sandstone, unpublished BSc. (Hon.) thesis, University of New England, Armidale.
- DECC 2007, *Introducing the NSW Threatened Species Priorities Action Statement (PAS)*, Department of Environment and Climate Change, Sydney, NSW, www.environment.nsw.gov.au/resources/threatenedspecies/threatspecpas07168.pdf.
- DECC 2008, *Review of State Conservation Areas: Report of the first five-year review of state conservation areas under the National Parks and Wildlife Act 1974*, Department of Environment and Climate Change, Sydney, NSW, www.environment.nsw.gov.au/parktypes/scareview.htm.
- DECCW 2010, *NSW Climate Impact Profile: The impacts of climate change on the biophysical environment of New South Wales*, Department of Environment, Climate Change and Water NSW, Sydney, www.environment.nsw.gov.au/climateChange/20100171ClmtChngNSW.htm.
- DEH 2005, *Threat Abatement Plan for Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs*, Department of Environment and Heritage, Canberra, www.environment.gov.au/biodiversity/threatened/publications/tap/pig.html.
- DoE 2009, *Listed Key Threatening Processes*, Department of the Environment, www.environment.gov.au/cgi-bin/sprat/public/publicgetkeythreats.pl.
- DoE 2015a, *Australian Heritage Database – Banyabba Nature Reserve – place ID 3417*, Commonwealth Department of Environment, Canberra, www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=place_detail;place_id=3417.
- DoE 2015b, *Australian Heritage Database – Indigenous Place, Camira Creek – place ID 3418*, Commonwealth Department of Environment, Canberra, www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=place_detail;place_id=3418.
- Floyd A 1990, *Australian Rainforests in New South Wales*, Surrey Beatty and Sons, NSW.
- Gilmour P & Helman C 1991, *Clarence Valley Rainforest Remnants Rescue – Stage 1: Rainforest Inventory*, Clarence Environment Centre.
- Hall G 1977, *The Road to the River (1839–1939) or Draylines to Deep Water*, second revised edition, Bording's Publications, Lismore, NSW.
- Hall R & Lomax K 1993, *Archaeological report, Casino Management Area, Northern Region, State Forests of NSW: Casino Management Area EIS Supporting Document No. 1*, State Forests of NSW, Pennant Hills, NSW.

- Margules R 1992, Grafton Management Area forest histories, unpublished manuscript.
- McBryde I 1974, *Aboriginal Prehistory in New England: An archaeological survey of northeastern New South Wales*, Sydney University Press, Sydney, NSW.
- McDougall KW 1997, Arsenic and DDT residues at cattle tip dip sites in NSW, *Land Contamination and Reclamation*, vol. 5, no. 4, pp. 323–8.
- McElroy CT 1962, The geology of the Clarence-Moreton Basin, *Mem. Geol. Surv.* 9.
- McElroy CT 1969, The Clarence-Moreton Basin in New South Wales, *J. Geol. Soc. Aust.* vol., 16, pp. 457–79.
- North Coast LHPA 2011, *Regional Wild Dog Management Plan for the North Coast Livestock Health and Pest Authority Area for the Management of Schedule 2 Lands as Prescribed by Pest Control Order Number 17. 2011–2015*, North Coast Livestock, Health and Pest Authority, Lismore, NSW.
- NPWS 1984, *Proposed Mt Neville Nature Reserve: natural resources and conservation values*, NSW National Parks and Wildlife Service, Natural Areas Investigation Section, Sydney.
- NPWS 1995a, *Vegetation Survey and Mapping of Upper North East New South Wales*, a report by the NSW National Parks and Wildlife Service for the Natural Resources Audit Council, Sydney.
- NPWS 1995b, *Vertebrates of Upper North East New South Wales*, a report by the NSW National Parks and Wildlife Service for the Natural Resources Audit Council, Sydney.
- NPWS 1998a, *Draft Fire Management Plan, Fortis Creek National Park and Banyabba Nature Reserve*, unpublished preliminary draft document, NSW National Parks and Wildlife Service, Grafton.
- NPWS 1998b, *Rock Art Conservation – Northern Region*, draft report to Northern Zone on field work undertaken in March 1998 by David Lambert, Cultural Heritage Services Division, NSW National Parks and Wildlife Service, Hurstville.
- NPWS 1999a, *Eleocharis tetraquetra* Nees *Recovery Plan*, NSW National Parks and Wildlife Service, Hurstville, NSW.
- NPWS 1999b, *Modelling Areas of Habitat Significance for Vertebrate Fauna and Vascular Flora in North-east NSW*, report prepared for the Joint Commonwealth NSW Regional Forest Agreement Steering Committee as part of the Comprehensive Regional Assessments, NSW National Parks and Wildlife Service, Coffs Harbour.
- NPWS 2001, *Northern Wilderness Assessment Report*, NSW National Parks and Wildlife Service, Coffs Harbour.
- NPWS 2002a, *Draft Southern Richmond Range Pest Management Plan*, internal working draft document, NSW National Parks and Wildlife Service, Grafton.
- NPWS 2002b, *Threatened Species of the Upper North Coast of New South Wales – Flora*, NSW National Parks and Wildlife Service, Coffs Harbour.
- NPWS 2006a, *Kooyong & Laurence Road State Conservation Areas Fire Management Strategy (Type 2)*, NSW National Parks and Wildlife Service North Coast Region, Grafton, www.environment.nsw.gov.au/resources/parks/kooyongFms.pdf.
- NPWS 2006b, *Mount Pikapene National Park Fire Management Strategy (Type 2)*, NSW National Parks and Wildlife Service North Coast Region, Grafton, www.environment.nsw.gov.au/resources/parks/MtPikapeneFms.pdf.

- NPWS 2006c, *Wombat Creek State Conservation Area Fire Management Strategy (Type 2)*, NSW National Parks and Wildlife Service North Coast Region, Grafton, www.environment.nsw.gov.au/resources/parks/wombatFms.pdf.
- NPWS 2007, *Southern Richmond Range Reserves Fire Management Strategy (Type 2). Incorporates Banyabba NR & SCA, Chapmans Peak NR, Corymbia SCA, Fortis Creek NP, Gurrang SCA and Mount Neville NR*, NSW National Parks and Wildlife Service North Coast Region, Grafton, www.environment.nsw.gov.au/resources/firemanagement/final/SRR.pdf.
- NRAC 1994, *Vegetation Study of Banyabba Nature Reserve*, Natural Resources Audit Council, Sydney.
- NSW DPI & OEH 2011, *Biodiversity Priorities for Widespread Weeds*, report prepared for the 13 Catchment Management Authorities (CMAs) by NSW Department of Primary Industries and Office of Environment & Heritage, Orange.
- NSW SC 1998, *Final Determination to List Predation by the European Red Fox *Vulpes vulpes* (Linnaeus 1758) as a Key Threatening Process on Schedule 3 of the TSC Act*, New South Wales Scientific Committee, www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=20015.
- NSW SC 2000a, *Final Determination to List Anthropogenic Climate Change as a Key Threatening Process on Schedule 3 of the TSC Act*, New South Wales Scientific Committee, www.environment.nsw.gov.au/threatenedspecies/HumanClimateChangeKTPListing.htm.
- NSW SC 2000b, *Final Determination to List High Frequency Fire Resulting in the Disruption of Life Cycle Processes in Plants and Animals and Loss of Vegetation Structure and Composition as a Key Threatening Process on Schedule 3 of the TSC Act*, New South Wales Scientific Committee, www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=20014.
- NSW SC 2002, *Final Determination to List Infection of Native Plants by *Phytophthora cinnamomi* as a Key Threatening Process on Schedule 3 of the TSC Act*, New South Wales Scientific Committee, www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=20026.
- NSW SC 2004, *Final Determination to List Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs, *Sus scrofa* Linnaeus 1758 as a Key Threatening Process on Schedule 3 of the TSC Act*, New South Wales Scientific Committee, www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=20020.
- NSW SC 2008, *Final Determination to List Forest Eucalypt Dieback Associated with Over-abundant Psyllids and Bell Miners as a Key Threatening Process on Schedule 3 of the TSC Act*, New South Wales Scientific Committee, www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=20108.
- OEH 2011, *Sustainable Mountain Biking Strategy*, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/parkmanagement/SustainableMtBStrategy.htm.
- OEH 2012a, *Strategic Directions for Horse Riding in NSW National Parks*, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/policies/HorseRideStrat.htm.
- OEH 2012b, *Regional Pest Management Strategy 2012–17, Northern Rivers Region: A new approach for reducing impacts on native species and park neighbours*, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/pestsweeds/RegionPestManagement.htm.
- OEH 2013a, *Living with Fire in NSW National Parks – A strategy for managing bushfires in national parks and reserves 2012–2021*, Revised edition, Office of Environment and Heritage, Sydney, NSW, www.environment.nsw.gov.au/resources/firemanagement/120690LiveFire.pdf.

- OEH 2013b, *Northern Rivers Region Horse Riding Work Plan 2013*, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/policies/Horseplans.htm.
- OEH 2013c, *Saving our Species*, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/savingourspecies/about.htm.
- OEH 2014a, *North Coast: Climate change snapshot*, Office of Environment and Heritage, Sydney, www.climatechange.environment.nsw.gov.au/Climate-projections-for-NSW/Climate-projections-for-your-region/North-Coast-Climate-Change-Downloads.
- OEH 2014b, *Second Review of State Conservation Areas*, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/parktypes/scareview.htm.
- OEH 2015, *NSW State Heritage Database – High Conservation Value Old Growth Forest – State Heritage Register number 01487*, Office of Environment and Heritage, Sydney, www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5051503.
- Paton DC 1996, *Overview of Feral and Managed Honeybees in Australia: Distribution, Abundance, Extent of Interactions with Native Biota, Evidence of Impacts and Future Research*, Australian Nature Conservation Agency, Canberra.
- Richards P 1999, *Threatened Plants Project: Northern Region*, a report prepared for the Joint Commonwealth NSW Regional Forest Agreement Steering Committee as part of the NSW Comprehensive Regional Assessments project number NA 22/EH incorporating NU 03/EH Targeted Flora Survey Project, Department of Urban Affairs & Planning, Sydney, and the Department of Prime Minister and Cabinet, Canberra.
- Scotts D 2003, *Key Habitats and Corridors for Forest Fauna: A landscape framework for conservation in north-east New South Wales*, Occasional Paper No 32, NSW National Parks and Wildlife Service, Hurstville.
- SFNSW 1995, *Environmental Impact Statement: Proposed forestry operations in Casino Management Area, Volume A: Main report*, State Forests of NSW, Pennant Hills, NSW.
- Sheringham P & Westaway J 1995, *Significant Vascular Plants of Upper North East New South Wales*, report by the NSW National Parks and Wildlife Service for the Natural Resources Audit Council, Sydney.
- Thackway R & Cresswell I 1995, *An Interim Biogeographic Regionalisation for Australia: A Framework for Establishing the National System of Reserves*, Version 4.0. Australian Nature Conservation Agency, Canberra.
- TSSC 2001a, *Commonwealth Listing Advice on Loss of Terrestrial Climatic Habitat Caused by Anthropogenic Emissions of Greenhouse Gases*, Threatened Species Scientific Committee, www.environment.gov.au/cgi-bin/sprat/public/publicshowkeythreat.pl?id=7.
- TSSC 2001b, *Commonwealth Listing Advice on Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs*, Threatened Species Scientific Committee, www.environment.gov.au/cgi-bin/sprat/public/publicshowkeythreat.pl?id=11.

Appendices

Key to Appendices A, B and C

Park codes:

B NR	Banyabba Nature Reserve
B SCA	Banyabba State Conservation Area
CP NR	Chapmans Peak Nature Reserve
C SCA	Corymbia State Conservation Area
FC NP	Fortis Creek National Park
G SCA	Gurranang State Conservation Area
K SCA	Kooyong State Conservation Area
LR SCA	Lawrence Road State Conservation Area
MN NR	Mount Neville Nature Reserve
MP NP	Mount Pikapene National Park
WC SCA	Wombat Creek State Conservation Area

Note: there are no records or predicted occurrences from Mount Pikapene SCA.

Records:

- = recorded within the park
- * = recorded within 2 kilometres and suitable habitat is present in the park
- ? = predicted to occur within the park (based on NPWS (1999b))

Legal status:

- CE** = listed as **critically endangered** under the TSC Act
- E** = listed as an **endangered** under the TSC Act
- V** = listed as **vulnerable** under the TSC Act
- #** = also listed under the EPBC Act

Appendix A: Threatened plant species recorded in or near the planning area

Scientific name	Common name	Legal status	B NR	B SCA	C SCA	FC NP	G SCA	K SCA	LR SCA	MN NR	MP NP	WC SCA
<i>Acacia ruppii</i>	Rupp's wattle	E #	•	•		•				•		•
<i>Angophora robur</i>	Sandstone rough-barked apple	V #	•		•	•						•
<i>Astrotricha cordata</i>	Heart-leaved star hair	E								•	?	
<i>Centranthera cochinchinensis</i>	Swamp foxglove	E			*	•						
<i>Cyperus aquatilis</i>	Water nutgrass	E		•								
<i>Eleocharis tetraquetra</i>	Square-stemmed spike-rush	E	•			•						
<i>Eucalyptus pachycalyx</i> subsp. <i>banyabba</i>	Banyabba shiny-barked gum	E #	•									
<i>Eucalyptus tetrapleura</i>	Square-fruited ironbark	V #				*		*		•		
<i>Geodorum densiflorum</i> (syn. <i>Geodorum terrestre</i>)	Pink nodding orchid	E			•							
<i>Grammitis stenophylla</i>	Narrow-leaf finger fern	E								•		•
<i>Grevillea banyabba</i>	Banyabba grevillea	V #	•	•		•						*
<i>Grevillea masonii</i>	Mason's grevillea	E #				•						
<i>Grevillea quadricauda</i>	Four-tailed grevillea	V #								•		
<i>Hibbertia marginata</i>	Bordered guinea flower	V	•					•		•		
<i>Kardomia silvestris</i> (syn. <i>Babingtonia silvestris</i>)	Woodland babingtonia	E								•		
<i>Lindsaea incisa</i>	Slender screw fern	E				•						
<i>Melichrus hirsutus</i>	Hairy melichrus	E #	•									•
<i>Olax angulata</i>	Square-stemmed olax	V #	•			•						
<i>Paspalidium grandispiculatum</i>	Helidon Hills panic	V #						•		•		
<i>Prostanthera sejuncta</i> (formerly <i>P. spinosa</i>)	Spiny mint-bush	V	•			•						
<i>Senna acclinis</i>	Rainforest cassia	V									?	
<i>Tinospora smilacina</i>	Tinospora vine	V									?	

Source: NPWS 1999b and Atlas of NSW (accessed 13 September 2011).

Appendix B: Other significant plant species recorded in or near the planning area

Scientific name	Common name	ROTAP code	Regional significance	B NR	B SCA	C SCA	FC NP	G SCA	K SCA	LR SCA	MN NR	MP NP	WC SCA
<i>Abildgaardia vaginata</i>	Bog-rush		rare in NSW				•						
<i>Acacia granitica</i>	Granite wattle		disjunct population	•	•		•				•		•
<i>Acacia hispidula</i>	Little harsh acacia		disjunct population distributional limit	•			•		•		•		
<i>Alstonia constricta</i>	Quinine bush		disjunct population									•	
<i>Angophora paludosa</i>	Small-leaved apple		distributional limit	•	*	•	•						
<i>Boronia chartacea</i>		3R	rare in NSW disjunct population	•	•		•				•		•
<i>Boronia rosmarinifolia</i>	Forest boronia		distributional limit	•		•		•					
<i>Bursaria cayzeriae</i>	Blackthorn	2VC-	newly described endemic	•			•						
<i>Callistemon acuminatus</i>	Tapering-leaved bottlebrush	3RC-	disjunct population distributional limit	•									
<i>Chiloglottis diphylla</i>	Common wasp orchid		uncommon in region						*		*	•	
<i>Daviesia wyattiana</i>	Long-leaf bitter-pea		disjunct population								•		
<i>Dodonaea hirsuta</i>	Hairy hop-bush	3RC-	newly described endemic	•	•		•						•
<i>Eucalyptus ancophila</i>		2K	distributional limit						•				
<i>Eucalyptus fusiformis</i>	Grey ironbark	2RC-		•							•		
<i>Eucalyptus notabilis</i>	Mountain mahogany		disjunct population in atypical habitat	•	•		•						
<i>Eucalyptus planchoniana</i>	Bastard tallowwood		distributional limit	•			•				•		•
<i>Eucalyptus psammitica</i>	Bastard white mahogany	3K	regional endemic	•	•		•			•	•		•
<i>Eucalyptus pyrocarpa</i>	Large-fruited blackbutt		regional endemic				•						•
<i>Eucalyptus rummeryi</i>	Steel box	3RC-	regional endemic distributional limit								•	•	•
<i>Hibbertia acuminata</i>	Guinea flower		regional endemic distributional limit	•					•		•		
<i>Hibbertia villosa</i>	Guinea flower	3KC-	disjunct population										•
<i>Hoya australis</i> (syn. <i>Hoya oligotricha</i>)	Native hoyo		depleted or sparse disjunct population									•	
<i>Iphigenia indica</i>	Red star grass lily		rare in NSW disjunct population distributional limit								•	*	

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Scientific name	Common name	ROTAP code	Regional significance	B NR	B SCA	C SCA	FC NP	G SCA	K SCA	LR SCA	MN NR	MP NP	WC SCA
<i>Isopogon mnoraifolius</i>	Drumstick		regional endemic	•	•		•						
<i>Keraudrenia corollata</i> var. <i>denticulata</i>	Inland velvet flower	3RC-	disjunct population				•						
<i>Keraudrenia hillii</i> var. <i>hillii</i>	Mountain keraudrenia		rare in NSW								*		
<i>Lambertia formosa</i>	Mountain devil		disjunct population	•	•		•		•				•
<i>Leucopogon recurvisepalus</i>		3KC-	poorly known	•							•		
<i>Lindsaea dimorpha</i>	Lindsaea fern		uncommon in region disjunct population	•	•						•		
<i>Macrozamia fawcettii</i>	Dwarf cycad		regional endemic	*	•						•		
<i>Marsdenia liisae</i>	Large-flowered milk vine	3RC-										•	
<i>Mirbelia speciosa</i> subsp. <i>ringrosei</i>			uncommon in region distributional limit								•		•
<i>Olearia stilwelliae</i>	Red-leaved daisy bush	3RCa	regional endemic distributional limit	•							•		•
<i>Phebalium nottii</i>	Pink phebalium		uncommon in region disjunct population	•									•
<i>Phebalium woombye</i>	Wallum phebalium		distributional limit		*						•		
<i>Philotheca conduplicata</i> (syn. <i>Eriostemon myoporoides</i> ssp. <i>conduplicatus</i>)	Wax flower	3RC	uncommon in region disjunct population	•									
<i>Plectranthus suaveolens</i>	Cockspur flower	3KC-		•							*		
<i>Pomaderris ferruginea</i>	Rusty pomaderris		uncommon in region disjunct population	*	•								
<i>Sauropus hirtellus</i> (syn. <i>Sauropus</i> sp. A)			rare in NSW	•				•					
<i>Tricoryne anceps</i> subsp. <i>pteroaulon</i>	Lily		rare in NSW disjunct population	•			*				*		
<i>Westringia blakeana</i>		2RCa	distributional limit								•		
<i>Westringia sericea</i>	Native rosemary	3RC-		•									
<i>Zieria pilosa</i>	Hairy zieria		uncommon in region disjunct population	*	•								

ROTAP codes used: 2 = geographic range in Australia less than 100 km; 3 = geographic range > 100 km; R = species considered rare but no threat currently identified; K = species suspected but not definitely known to be rare or threatened; C = at least one population known to occur within a conservation reserve; a = 1000 plants or more known within reserve/s; - = reserved population size not known. **Regional significance** based on criteria in Richards (1999) and Sheringham & Westaway (1995).

Source: Atlas of NSW Wildlife (accessed 13 September 2011). Additional information provided by J. Bruhl, I. Telford & L. Copeland based on records held by the UNE Herbarium.

Appendix C: Threatened animal species recorded or predicted to occur in the planning area

Common name	Scientific name	Legal status	B NR	B SCA	CP NR	C SCA	FC NP	G SCA	K SCA	LR SCA	MN NR	MP NP	WC SCA
Frogs													
Green-thighed frog	<i>Litoria brevipalmata</i>	V	?	*		?	?	•	?	?	*	?	
Giant barred frog	<i>Mixophyes iteratus</i>	E #										*	
Reptiles													
White-crowned snake	<i>Cacophis harriettae</i>	V	•	*		?	•	?	?	?	?		?
Three-toed snake-tooth skink	<i>Coeranoscincus reticulatus</i>	V #										?	
Pale-headed snake	<i>Hoplocephalus bitorquatus</i>	V				?		?					
Stephens' banded snake	<i>Hoplocephalus stephensii</i>	V	*	*			*		•		?	?	
Birds													
Regent honeyeater	<i>Anthochaera phrygia</i>	CE #	?	?			?		?		?		
Bush stone-curlew	<i>Burhinus grallarius</i>	E	?	?	?	?	?	•		?	?		
Glossy black-cockatoo	<i>Calyptorhynchus lathami</i>	V	•	•		*	•	•	•	?	•	•	?
White-eared monarch	<i>Carterornis leucotis</i>	V									?		
Brown treecreeper	<i>Climacteris picumnus victoriae</i>	V	•	•			•		*	*	*		
Barred cuckoo-shrike	<i>Coracina lineata</i>	V										?	
Coxen's fig-parrot	<i>Cyclopsitta diopthalma coxeni</i>	CE #										?	
Varied sittella	<i>Daphoenositta chrysoptera</i>	V	•	•			•				•		
Black-necked stork	<i>Ephippiorhynchus asiaticus</i>	E						*					
Little lorikeet	<i>Glossopsitta pusilla</i>	V	•	•			•	•	•	*	•	•	
Little eagle	<i>Hieraaetus morphnoides</i>	V										•	
Comb-crested jacana	<i>Irediparra gallinacea</i>	V		*			•						
Black bittern	<i>Ixobrychus flavicollis</i>	V									?		
Swift parrot	<i>Lathamus discolor</i>	E #	?	?			?		?		?		
Square-tailed kite	<i>Lophoictinia isura</i>	V	?	?		*	*		?		?	?	
Hooded robin	<i>Melanodryas cucullata cucullata</i>	V	?	?		?	•	?	?	?	?		*
Black-chinned honeyeater	<i>Melithreptus gularis gularis</i>	V	*	•		?	•	*		*			
Turquoise parrot	<i>Neophema pulchella</i>	V					•						
Barking owl	<i>Ninox connivens</i>	V	*	*		?	*	*	?		?		
Powerful owl	<i>Ninox strenua</i>	V	?	*	?	?	•	•	*	*	•	•	?
Marbled frogmouth	<i>Podargus ocellatus</i>	V										?	
Grey-crowned babbler	<i>Pomatostomus temporalis temporalis</i>	V	*	•		?	•	*	*	*	?		?
Wompoo fruit-dove	<i>Ptilinopus magnificus</i>	V										•	
Rose-crowned fruit-dove	<i>Ptilinopus regina</i>	V										•	
Superb fruit-dove	<i>Ptilinopus superbus</i>	V										•	

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Common name	Scientific name	Legal status	B NR	B SCA	CP NR	C SCA	FC NP	G SCA	K SCA	LR SCA	MN NR	MP NP	WC SCA
Speckled warbler	<i>Chthonicola sagittata</i>	V		*									
Diamond firetail	<i>Stagonopleura guttata</i>	V	*				•						*
Black-breasted button-quail	<i>Turnix melanogaster</i>	CE #										?	
Masked owl	<i>Tyto novaehollandiae</i>	V	•	•		?	•	•	*	*	*	•	?
Sooty owl	<i>Tyto tenebricosa</i>	V									*	*	
Mammals													
Rufous bettong	<i>Aepyprymnus rufescens</i>	V	*	*	?	?	•	?	*	*	•	•	?
Eastern pygmy-possum	<i>Cercartetus nanus</i>	V									?	?	
Large-eared pied bat	<i>Chalinolobus dwyeri</i>	V #									•	•	
Hoary wattled bat	<i>Chalinolobus nigrogriseus</i>	V	•	•		*	•	•	?	?	?		
Spotted-tailed quoll	<i>Dasyurus maculatus</i>	V #	*	*		•	*			*	•		
Eastern false pipistrelle	<i>Falsistrellus tasmaniensis</i>	V	*	*			•		*	*			
Golden-tipped bat	<i>Kerivoula papuensis</i>	V										?	
Black-striped wallaby	<i>Macropus dorsalis</i>	E										•	
Parma wallaby	<i>Macropus parma</i>	V									?		
Little bentwing-bat	<i>Miniopterus australis</i>	V	•	•		*	•	•	•	*	•	•	
Eastern bentwing-bat	<i>Miniopterus schreibersii oceanensis</i>	V	*	•	?	?	•		*	*	?	?	
Eastern freetail-bat	<i>Mormopterus norfolkensis</i>	V		*		*							
Southern myotis	<i>Myotis macropus</i>	V	?	*		*	*	•		?	?		
Yellow-bellied glider	<i>Petaurus australis</i>	V	•	•		*	•	•	?		*	•	
Squirrel glider	<i>Petaurus norfolcensis</i>	V	*	•		?	•	?	*	?	•	•	?
Brush-tailed rock-wallaby	<i>Petrogale penicillata</i>	E #									?		
Brush-tailed phascogale	<i>Phascogale tapoatafa</i>	V	*	*		?	•	•	*	*	?	*	?
Koala	<i>Phascolarctos cinereus</i>	V #	•	•	*	*	•	*	*	•	•	•	•
Common planigale	<i>Planigale maculata</i>	V	•	*	?	?	?	?	?	?	*		?
Eastern chestnut mouse	<i>Pseudomys gracilicaudatus</i>	V	?	?	?		?		?	?	?	•	?
Grey-headed flying-fox	<i>Pteropus poliocephalus</i>	V #	•	•		*	•	•	•		•	•	
Yellow-bellied sheath-tail-bat	<i>Saccolaimus flaviventris</i>	V	•	•		*	•						
Greater broad-nosed bat	<i>Scoteanax rueppellii</i>	V	•	•				•	*		?	*	
Red-legged pademelon	<i>Thylogale stigmatica</i>	V										?	
Eastern cave bat	<i>Vespadelus troughtoni</i>	V	*			*	*				?		?

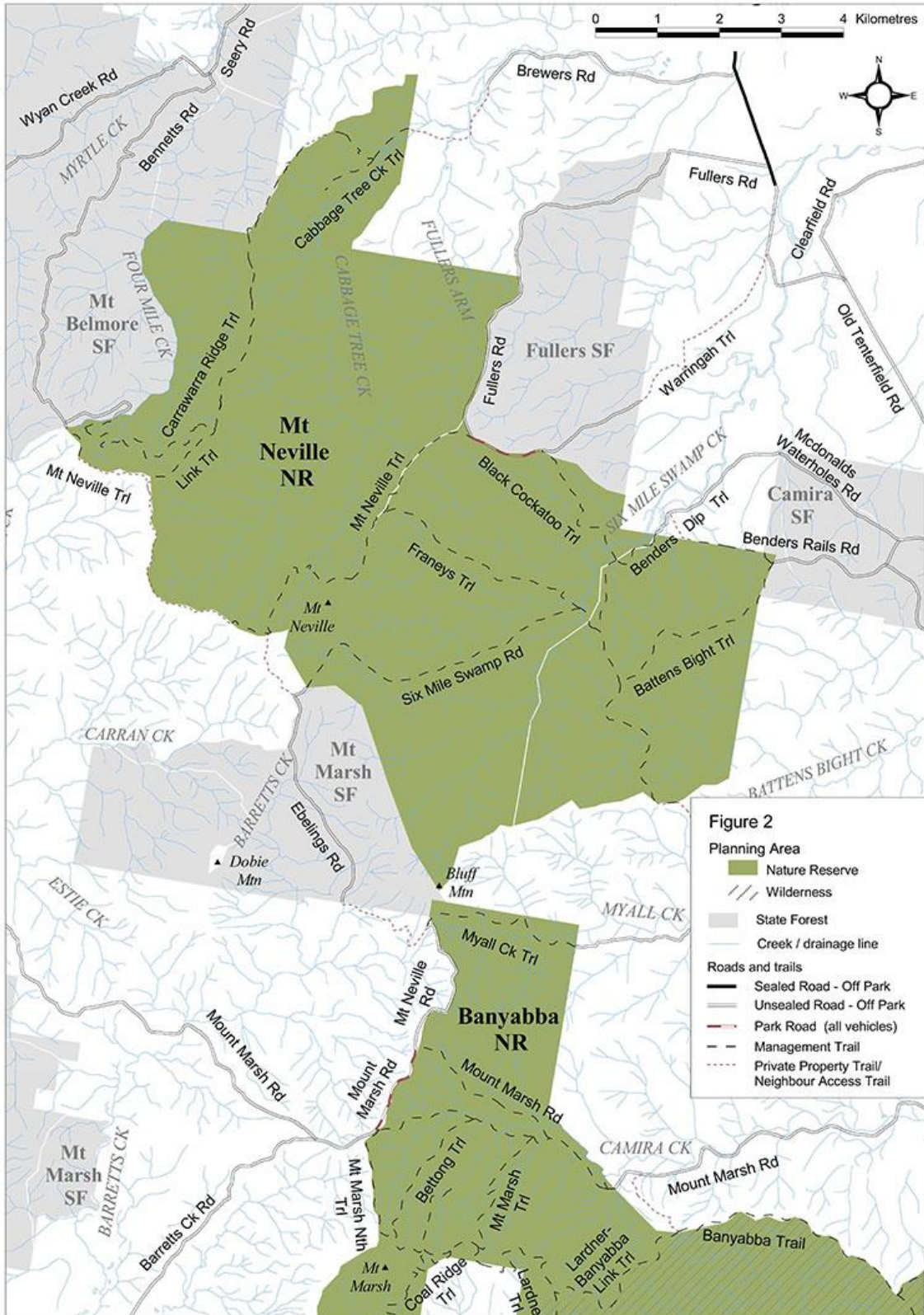
Source: Atlas of NSW Wildlife (accessed July 2011); NPWS 1999b; Kooyong SCA survey site records.

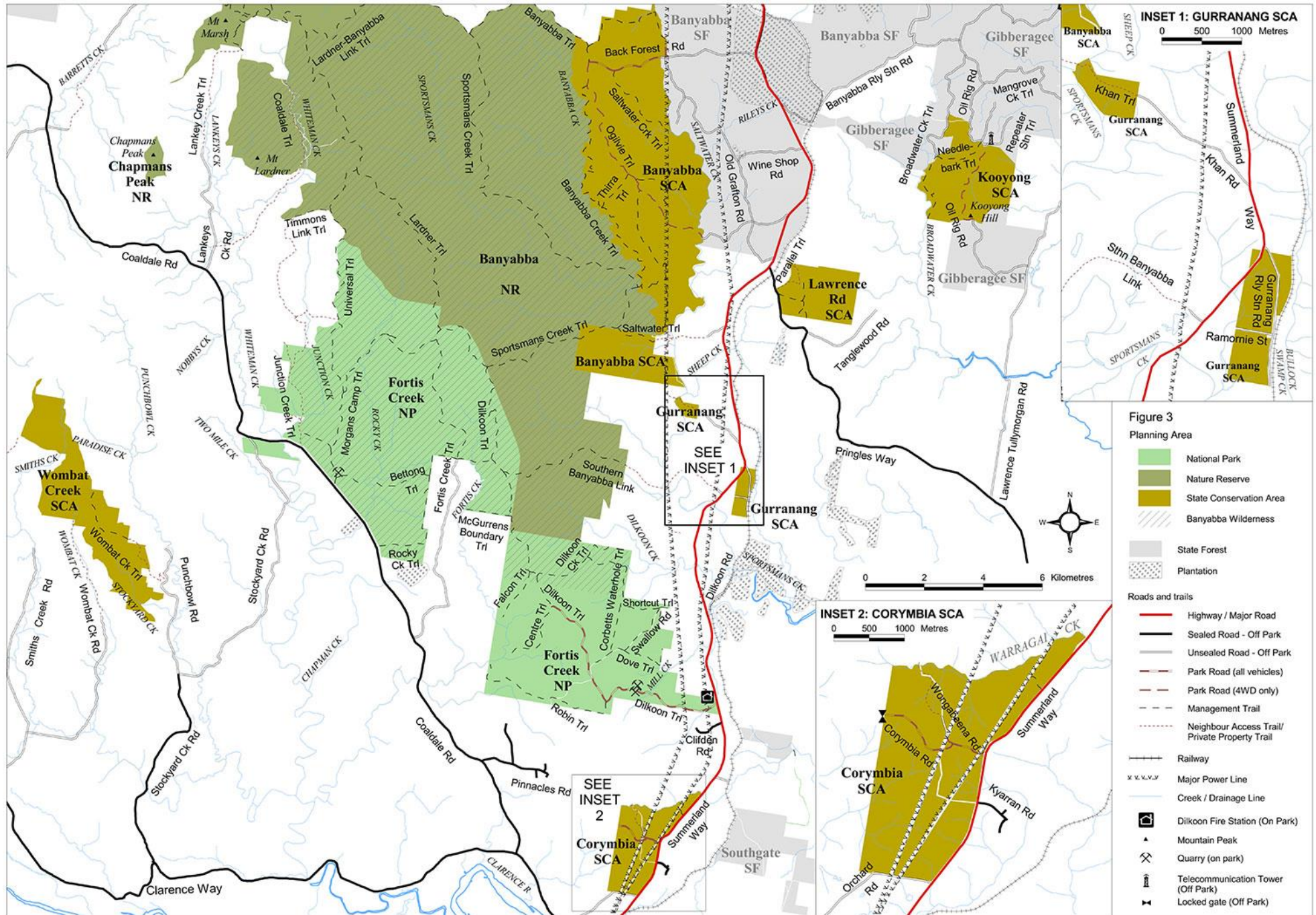
Appendix D: Animal species assemblages for key habitat within the planning area

Common name	Scientific name
Moist Escarpment – Foothills assemblage	
Glossy black-cockatoo	<i>Calyptorhynchus lathamii</i>
Powerful owl	<i>Ninox strenua</i>
Masked owl	<i>Tyto novaehollandiae</i>
Spotted-tail quoll	<i>Dasyurus maculatus</i>
Koala	<i>Phascolarctos cinereus</i>
Greater glider	<i>Petauroides volans</i>
Yellow-bellied glider	<i>Petaurus australis</i>
Rufous bettong	<i>Aepyprymnus rufescens</i>
Grey-headed flying-fox	<i>Pteropus poliocephalus</i>
White-striped mastiff-bat	<i>Tadarida australis</i>
Little bentwing-bat	<i>Miniopterus australis</i>
Common bentwing-bat	<i>Miniopterus schreibersii</i>
Eastern forest bat	<i>Vespadelus pumilus</i>
Dry Coastal Foothills assemblage	
Green-thighed frog	<i>Litoria brevipalmata</i>
White-crowned snake	<i>Cacophis harriettae</i>
Pale-headed snake	<i>Hoplocephalus bitorquatus</i>
Black-necked stork	<i>Ephippiorhynchus asiaticus</i>
Red goshawk	<i>Erythrotriorchis radiatus</i>
Bush stone-curlew	<i>Burhinus grallarius</i>
Musk lorikeet	<i>Glossopsitta concinna</i>
Turquoise parrot	<i>Neophema pulchella</i>
Little bronze-cuckoo	<i>Chalcites minutillus</i>
Forest kingfisher	<i>Todiramphus macleayii</i>
Hooded robin	<i>Melanodryas cucullata cucullata</i>
Grey-crowned babbler	<i>Pomatostomus temporalis temporalis</i>
Yellow-tufted honeyeater	<i>Lichenostomus melanops</i>
Brush-tailed phascogale	<i>Phascogale tapoatafa</i>
Common planigale	<i>Planigale maculata</i>
Squirrel glider	<i>Petaurus norfolcensis</i>
Hoary wattled bat	<i>Chalinolobus nigrogriseus</i>
Little broad-nosed bat	<i>Scotorepens greyii</i>
Central-eastern broad-nosed bat	<i>Scotorepens sp. 1</i>
Eastern chestnut mouse	<i>Pseudomys gracilicaudatus</i>
New Holland mouse	<i>Pseudomys novaehollandiae</i>
Pale field-rat	<i>Rattus tunneyi</i>

Common name	Scientific name
Wet Escarpment – Foothills assemblage	
Pouched frog	<i>Assa darlingtoni</i>
Fleay's barred frog	<i>Mixophyes fleayi</i>
Leaf-tailed gecko	<i>Saltuarius swaini</i>
Southern angle-headed dragon	<i>Hypsilurus spinipes</i>
Short-limbed snake-skink	<i>Ophioscincus truncatus</i>
Orange-tailed shadeskink	<i>Saproscincus challengerii</i>
Stephens' banded snake	<i>Hoplocephalus stephensii</i>
Rose-crowned fruit-dove	<i>Ptilinopus regina</i>
Superb fruit-dove	<i>Ptilinopus superbus</i>
Wompoo fruit-dove	<i>Ptilinopus magnificus</i>
Marbled frogmouth	<i>Podargus ocellatus</i>
Albert's lyrebird	<i>Menura alberti</i>
Pale-yellow robin	<i>Tregellasia capito</i>
Little shrike-thrush	<i>Colluricincla megarhyncha</i>
White-eared monarch	<i>Carterornis leucotis</i>
Barred cuckoo-shrike	<i>Coracina lineata</i>
Dusky antechinus	<i>Antechinus swainsonii</i>
Red-legged pademelon	<i>Thylogale stigmatica</i>
Eastern tube-nosed bat	<i>Nyctimene robinsoni</i>
Wet Escarpment assemblage	
Giant barred frog	<i>Mixophyes iteratus</i>
Murray's skink	<i>Eulamprus murrayi</i>
Barred-sided skink	<i>Eulamprus tenuis</i>
Sooty owl	<i>Tyto tenebricosa</i>
Paradise riflebird	<i>Ptiloris paradiseus</i>
Eastern pygmy-possum	<i>Cercartetus nanus</i>
Long-nosed potoroo	<i>Potorous tridactylus</i>
Eastern horseshoe-bat	<i>Rhinolophus megaphyllus</i>
Eastern freetail-bat	<i>Mormopterus norfolkensis</i>
Large-eared pied bat	<i>Chalinolobus dwyeri</i>
Greater broad-nosed bat	<i>Scoteanax rueppellii</i>

Source: NPWS 2001.





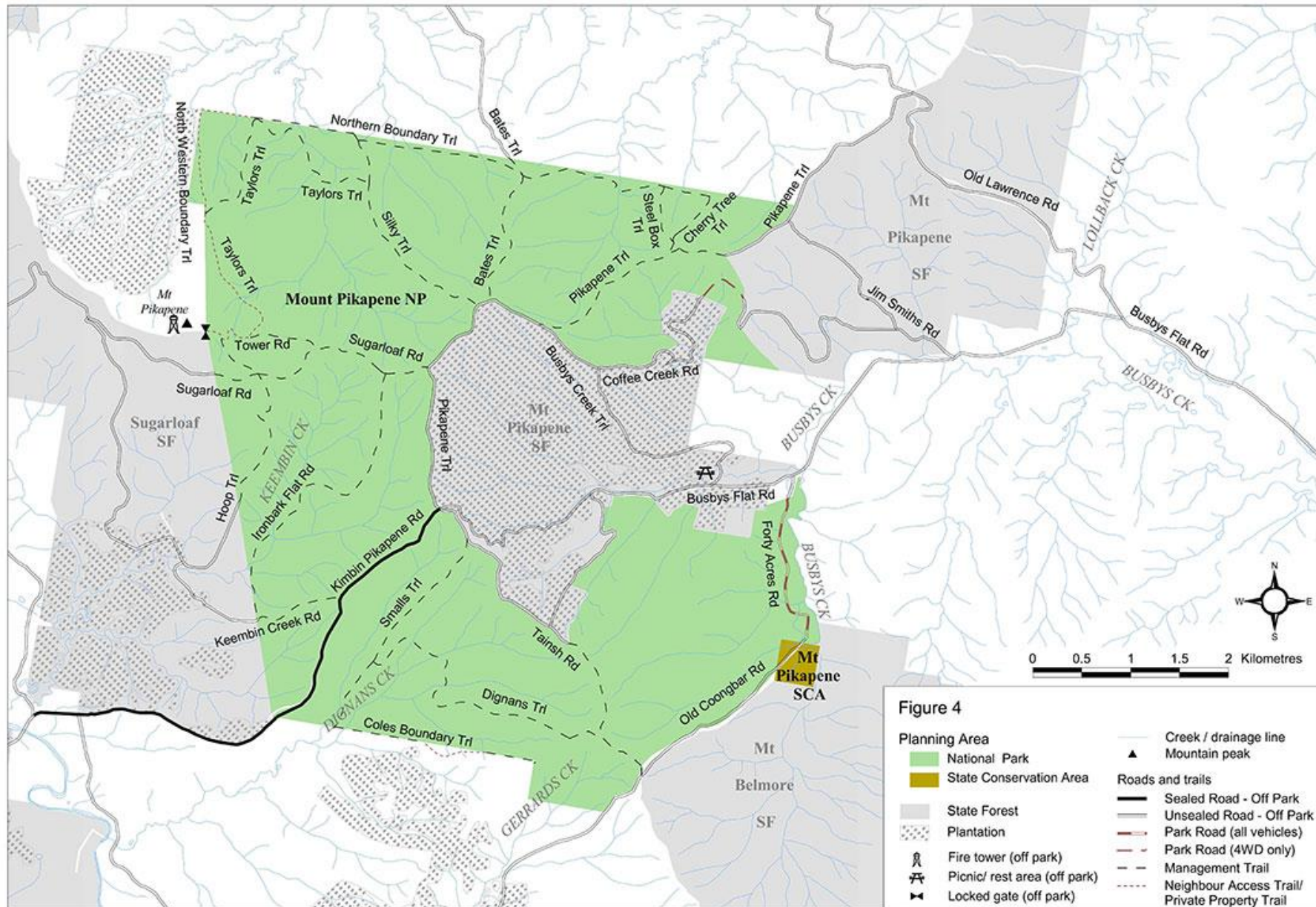


Figure 4

Planning Area	Creek / drainage line
National Park	Mountain peak
State Conservation Area	Roads and trails
State Forest	Sealed Road - Off Park
Plantation	Unsealed Road - Off Park
Fire tower (off park)	Park Road (all vehicles)
Picnic/ rest area (off park)	Park Road (4WD only)
Locked gate (off park)	Management Trail
	Neighbour Access Trail/ Private Property Trail