



Southern Richmond Range Group

(Incorporating Fortis Creek and Mount Pikapene National Parks, Banyabba, Chapmans Peak and Mount Neville Nature Reserves, and Kooyong, Banyabba, Wombat Creek, Laurence Road, Gurrang and Corymbia State Conservation Areas)

Draft Plan of Management



Department of
Environment and Conservation (NSW)

SOUTHERN RICHMOND RANGE GROUP

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

DRAFT PLAN OF MANAGEMENT

**NSW National Parks and Wildlife Service
Part of the Department of Environment and Conservation (NSW)**

July 2005

Acknowledgments:

This plan of management was prepared by staff of the Clarence North Area of the NSW National Parks and Wildlife Service (NPWS), with the assistance of staff of the Northern Branch Planning and Performance Unit and Environment Protection and Regulation Division.

NPWS specialists, the Regional Advisory Committee and members of the public provided valuable information and comments.

NPWS would like to thank all those who attended the neighbour and stakeholder meetings and to all those who took the time to make a submission on the Southern Richmond Range Parks and Reserves 'Issues Paper'. Your comments and concerns were considered in the preparation of this draft Plan of Management and NPWS recognises the valuable contribution your comments have made to the planning process.

For additional information or enquires about any aspect of the plan, contact the NPWS Clarence North Area Office at Level 3, 49 Victoria St (PO Box 361) GRAFTON NSW 2460 or by phone on (02) 6641 1500.

Copyright Department of Environment and Conservation (NSW) 2005: Use permitted with appropriate acknowledgment.

ISBN 0 7313 6590 9

INVITATION TO COMMENT

The *National Parks and Wildlife Act 1974* (NPW Act) requires that a plan of management be prepared that outlines how an area will be managed by the NSW National Parks and Wildlife Service (NPWS).

The procedures for the exhibition and consultation on plans are specified in the NPW Act and involve the following stages:

- The draft plan is placed on public exhibition for at least 90 days and any person may comment on it;
- The plan and submissions received on the plan are referred to the Regional Advisory Committee for consideration;
- The plan, submissions and any advice from the Regional Advisory Committee are referred to the National Parks and Wildlife Advisory Council for consideration;
- The plan, submissions and the recommendations of the Advisory Council are referred to the Minister for the Environment, and a copy referred to the Regional Advisory Committee;
- After considering the submissions, the recommendations of the Advisory Council and any advice from the Regional Advisory Committee, the Minister may adopt the plan or may refer the plan back to the NPWS and Council for further consideration.

Members of the public, whether as private individuals or as members of community interest groups are invited to comment on this plan of management. Submissions should be in writing, and as detailed and specific as possible; however any comments, no matter how brief, are welcome.

Comments should be forwarded to:

Area Manager, Clarence North
National Parks and Wildlife Service
PO Box 361
GRAFTON NSW 2460

The closing date for public comment on this plan is Monday 28 November 2005.

All submissions received by NPWS are a matter of public record and are available for public inspection upon request to NPWS. Your comments on this draft plan of management may contain information that is defined as "personal information" under the NSW *Privacy and Personal Information Protection Act 1998*. The submission of personal information with your comments is voluntary.

CONTENTS

	PAGE
1. INTRODUCTION	1
1.1 LOCATION, REGIONAL SETTING AND RESERVATION	1
Table 1. Size of the Southern Richmond Range Planning Area.....	1
1.2 IMPORTANCE OF THE SOUTHERN RICHMOND RANGE PARKS, RESERVES & CONSERVATION AREAS.....	3
2. MANAGEMENT CONTEXT	4
2.1 LEGISLATION AND POLICY FRAMEWORK.....	4
3. PURPOSE OF RESERVING LAND AND MANAGEMENT PRINCIPLES.....	6
3.1 MANAGEMENT PURPOSES AND PRINCIPLES	6
3.2 SPECIFIC DIRECTIONS FOR THE PLANNING AREA	7
4. CONSERVATION OF NATURAL LANDSCAPES	8
4.1 GEOLOGY, LANDFORM, HYDROLOGY AND SOILS	8
4.3 NATIVE ANIMALS.....	12
4.4 FIRE MANAGEMENT	14
4.5 INTRODUCED PLANTS AND ANIMALS.....	17
5. CONSERVATION OF CULTURAL HERITAGE.....	20
5.1 ABORIGINAL HERITAGE.....	20
5.2 HISTORIC HERITAGE	21
6. USE OF THE PLANNING AREA	23
6.1 VISITOR USE	23
Table 2. Public Vehicle Access to the Planning Area Boundary.	24
Table 3. Park Roads Within the Planning Area.	24
6.2 INFORMATION AND EDUCATION.....	27
6.3 RESEARCH AND MONITORING	28
6.4 MANAGEMENT OPERATIONS	29
Table 4. Ministerial Roads in the Planning Area.....	30
7. PLAN IMPLEMENTATION.....	34
Table 5: Implementation.....	35
8. BIBLIOGRAPHY	45
9. APPENDICES	48

APPENDIX 1: VEGETATION COMMUNITIES OF THE PLANNING AREA	48
Table 6: Vegetation communities of Fortis Creek National Park	48
Table 7: Vegetation communities of Banyabba Nature Reserve	49
Table 8: Vegetation communities of Mount Neville Nature Reserve	50
Table 9: Vegetation communities of Mount Pikapene National Park.....	51
Table 10: Vegetation communities of Chapman’s Peak Nature Reserve.....	51
Table 11: Vegetation communities of Wombat Creek State Conservation Area	51
Table 12: Vegetation communities of Banyabba State Conservation Area	52
Table 13: Vegetation communities of Corymbia State Conservation Area.....	52
Table 14: Vegetation communities of Gurrang State Conservation Area	53
Table 15: Vegetation communities of Kooyong State Conservation Area	53
Table 16: Vegetation communities of Laurence Road State Conservation Area	54
 APPENDIX 2. THREATENED FLORA OF THE PLANNING AREA	 55
Table 17: Flora species of the planning area listed under the TSC Act.....	55
Table 18: Regionally Significant and Rare Plants of the planning area.....	55
 APPENDIX 3: THREATENED FAUNA OF THE PLANNING AREA.....	 57
Table 19: Threatened fauna species of the planning area	57
 APPENDIX 4: FIRE MANAGEMENT REQUIREMENTS FOR THREATENED FLORA OF THE PLANNING AREA.....	 61
Table 20: Threatened and endemic flora of fire concern in the Glenreagh- Coaldale sandstone belt of the planning area	61
 APPENDIX 5: FAUNA SPECIES ASSEMBLAGES FOR KEY HABITAT IN THE PLANNING AREA	 63
Table 21: Fauna species assemblages for key habitat within the planning area	63
 FIGURE 1: BANYABBA, CHAPMAN’S PEAK AND MOUNT NEVILLE NATURE RESERVES, FORTIS CREEK NATIONAL PARK AND BANYABBA, CORYMBIA, KOOYONG, LAURENCE ROAD, GURRANANG AND WOMBAT CREEK STATE CONSERVATION AREAS.....	 65
 FIGURE 2: MOUNT PIKAPENE NATIONAL PARK	 66

1. INTRODUCTION

1.1 Location, Regional Setting and Reservation

The Southern Richmond Range national parks, nature reserves and state conservation areas are located along the southern section of the Richmond Range in the hinterland of the north coast of New South Wales (NSW). They include Fortis Creek and Mount Pikapene National Parks, Banyabba, Chapman's Peak and Mount Neville Nature Reserves and Banyabba, Corymbia, Gurrang, Kooyong, Laurence Road and Wombat Creek State Conservation Areas (referred to herein as the 'planning area').

The planning area is located within the Clarence Valley and Richmond River local government areas.

These parks, reserves and state conservation areas collectively cover an area of **37,627** ha, as detailed in Table 1. The planning area can be seen in Figures 1 and 2. The parks, reserves and state conservation areas have been grouped under the one plan due to their close biogeographical association. The planning area is also associated with other National Parks and Wildlife Service (NPWS) estate along the northern part of the Richmond Range. These reserves are covered in a separate plan titled 'The Parks and Reserves of the Northern Richmond Range.'

Table 1. Size of the Southern Richmond Range Planning Area.

Reserve Name	Area (ha)
Fortis Creek National Park	7,950
Mount Pikapene National Park	2,630
Banyabba Nature Reserve	15,209
Chapman's Peak Nature Reserve	72
Mount Neville Nature Reserve	5,821
Kooyong State Conservation Area	753
Banyabba State Conservation Area	3070
Wombat Creek State Conservation Area	1076
Laurence Road State Conservation Area	440
Gurrang State Conservation Area	111
Corymbia State Conservation Area	495
TOTAL	37,627

Fortis Creek National Park is located approximately 20 km north-west of Grafton. The park adjoins Banyabba Nature Reserve to the north and north-east, and freehold land mainly used for grazing on the other boundaries. Fortis Creek National Park was formerly part of Fortis Creek State Forest until gazetted as national park in January 1997. A former inholding of approximately 112 ha centred about the area known as Morgan's Camp and the remaining portion of Fortis Creek State Forest in the north-western section of Fortis Creek National Park was purchased by the NPWS in 1999 and was gazetted as part of the park in January 2003. The western part of the park is part of the Banyabba Wilderness, (refer to *2.1 Legislation & Policy Framework, 2.3 Wilderness* and Figure 1).

Mount Pikapene National Park is the northern-most park in the planning area, located approximately 35km southwest of Casino. The park was gazetted in 1999 and was formerly part of Mount Pikapene State Forest. Mount Pikapene National Park adjoins Mt Pikapene State Forest to the east, Cherry Tree State Forest to the north-east, Sugarloaf State Forest to the west and Mount Belmore State Forest to the south-east. Privately owned land adjoins the park on the northern and southern boundaries.

Banyabba Nature Reserve is located approximately 30 km north-west of Grafton. The reserve adjoins Fortis Creek National Park to the south and Mount Neville Nature Reserve to the north. The reserve also adjoins Banyabba State Conservation Area to the east, and freehold land mainly used for grazing to the west. Banyabba Nature Reserve was first gazetted in 1969 with additions in 1999. These additions were previously part of the Mount Marsh State Forest and vacant Crown land surrounding Mount Lardner. The majority of the reserve falls within the Banyabba Wilderness (refer to *2.1 Legislation & Policy Framework*, *2.3 Wilderness*). See also Figure 1.

Chapman's Peak Nature Reserve is located approximately 35 km north-west of Grafton. The reserve is located 5 km to the west of Banyabba Nature Reserve and adjoins timbered freehold land on all sides. The reserve was gazetted in 1999 over former vacant Crown land.

Mount Neville Nature Reserve is located approximately 55 km north-west of Grafton. The reserve adjoins Banyabba Nature Reserve to the south, Mount Marsh and Mount Belmore State Forests to the west, Fullers State Forest to the east, and freehold land, mainly used for grazing, on its other boundaries. The reserve was originally gazetted in 1987 with additions in 1999. The reserve was previously part of Mount Marsh and Mount Belmore State Forests and vacant Crown land.

Kooyong State Conservation Area contains the former Needlebark Flora Reserve and an area that was formerly part of Gibberagee State Forest. The state conservation area is located 5km south-east of the village of Banyabba, approximately 28km north of Grafton. Gibberagee State Forest largely surrounds the area, with some adjoining areas of private land. This area was transferred to NPWS estate on 1 January 2003 through the North-East Regional Forest Agreement process (refer to *2.1 Legislation and Policy Framework*).

Banyabba State Conservation Area adjoins Banyabba Nature Reserve to the west and Banyabba State Forest to the east. Along with the other state conservation areas within the planning area, Banyabba State Conservation Area was gazetted on 1 January 2003 under the *National Park Estate (Reservations) Act 2002*. Prior to gazettal, the area was part of Banyabba State Forest and then dedicated as Banyabba Crown Reserve under the *Forestry and National Parks Estate Act 1998*.

Wombat Creek State Conservation Area is located 25 km northwest of Grafton and is surrounded by private property. The state conservation area spans almost 9km from the northern tip of Coal Ridge Cliffs to Whiskey Stills Falls in the south. Prior to gazettal in January 2003, the area was dedicated as a Crown Reserve under the *Forestry and National Parks Estate Act 1998*. The area is surrounded by privately owned grazing and forested land and is only accessible via private property.

Laurence Road State Conservation Area is located 12 km north-west of the village of Lawrence and 32km north of Grafton. It adjoins Banyabba State Forest at its northern most point, but is largely surrounded by privately owned land. The area is accessible from Pringles Way on the eastern boundary. Prior to gazettal in January 2003, the area was dedicated as a Crown Reserve under the *Forestry and National Parks Estate Act 1998*.

Gurranang State Conservation Area comprises two separate land parcels in the locality of Gurranang, approximately 25 km north of Grafton. The southern section is located near Bullock Swamp Creek and the northern section is two kilometres to the north on Sportsmans Creek. Prior to gazettal in January 2003, the area was dedicated as a Crown Reserve under the *Forestry and National Parks Estate Act 1998*.

Corymbia State Conservation Area forms the southern-most extent of the planning area, located approximately 12km north of Grafton. The area is to the west of Southgate State Forest and is surrounded by privately owned land. Prior to gazettal in January 2003, the area was dedicated as the Corymbia Crown Reserve under the *Forestry and National Park Estate Act 1998*.

1.2 Importance of the Southern Richmond Range Parks, Reserves & Conservation Areas

The natural and cultural attributes of an area and previous landuses are strongly inter-related and together form the landscape of an area. In the main, the planning area is comprised of rugged sandstone ridges and valleys, generally unsuitable for agriculture. The nature of this terrain has largely limited past uses to bush grazing and limited forestry activity. As a consequence, the planning area is largely unmodified and provides a core area of habitat and an extensive ecological corridor along the southern section of the Richmond Range. This corridor links coastal habitat to the east of the planning area to protected areas of the M^cPherson Ranges, on the NSW-QLD border (NPWS 2001a).

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. The wilderness area covers the majority of Banyabba Nature Reserve and Fortis Creek National Park. Banyabba Nature Reserve is also listed on the Register of National Estate for its outstanding natural catchment and river system values.

The planning area conserves a large area of relatively undisturbed, predominantly sandstone vegetation that is not well represented in conservation areas in northern NSW. This includes a number of significant plant and animal species, many of which are listed under the *Threatened Species Conservation Act 1995* (TSC Act) and/or are endemic to the area. The planning area is particularly important due to the high degree of vegetation connectivity across the landscape. This connectivity facilitates the movement of fauna and the exchange of plant genetic material across the landscape, increasing the long-term viability of conserving natural heritage values in the region.

The planning area is part of a landscape of cultural importance to the Bundjalung Aboriginal Nation. It contains a number of known Aboriginal sites and places of cultural importance including a rock art shelter listed on the Register of National Estate.

Both Aboriginal and non-Aboriginal people place cultural values on natural areas, including aesthetic, social, spiritual, recreational and other values. Cultural 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.

This plan of management aims to conserve both natural and cultural values. For reasons of clarity, natural and cultural heritage, threats as well as past and future land uses are dealt with individually within this document, but their inter-relationships are recognised.

2. MANAGEMENT CONTEXT

2.1 Legislation and Policy Framework

The management of national parks, nature reserves and state conservation areas in NSW is in accordance with the legislative and policy frameworks, primarily the *National Parks and Wildlife Act 1974* (NPW Act), the *Threatened Species Conservation Act 1995* (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 NSW *Environmental Planning and Assessment Act 1979* (EPA Act) requires the assessment and mitigation of environmental impacts of any works proposed in this plan.

A plan of management is a statutory document under the NPW Act. Once the Minister has adopted a plan, 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 planning area. Where management strategies or works are proposed for the planning area, or any additions that are not consistent with the plan, an amendment to the plan will be required.

2.2 Regional Forest Agreements

Regional Forest Agreements are one of the principle means of implementing the National Forest Policy Statement of 1992. Under this Statement, Commonwealth, State and Territory governments agreed to work towards a shared vision for Australia's forests. This aimed to maintain native forest estate, manage it in an ecologically sustainable manner and develop sustainable forest-based industries. Joint comprehensive assessments of the natural, cultural, economic and social values of forests formed the basis for negotiation of Regional Forest Agreements.

The North East Regional Forest Agreement of 2000 (North East RFA) covers the planning area. The process leading up to the RFA provided for major additions to the reserve system, including the establishment of Mount Pikapene National Park and the addition of significant areas to the Banyabba and Mount Neville Nature Reserves.

Under the North East RFA, all forest managers, including the NPWS, must demonstrate ecologically sustainable forest management (ESFM) (refer to 6.3 *Research and Monitoring*).

ESFM aims to maintain or increase forest values across the NSW native forest estate, including:

- ecosystem biodiversity, health, vitality, productive capacity and functional processes;
- soil and water productive capacity and functional processes;
- long term social and economic benefit; and
- natural and cultural heritage values.

2.3 Wilderness

The *Wilderness Act 1987* provides for the protection, management and use of wilderness areas. A wilderness area is an area of land that has remained substantially free of human modification, is of sufficient size to be a self-maintaining ecosystem and provides opportunities for solitude and self-reliant recreation.

The majority of Banyabba Nature Reserve and Fortis Creek National Park (approx 18,000 ha) form the Banyabba Wilderness (see Figure 1). The Banyabba Wilderness includes the largest natural area in the southern Richmond Range and provides an area for scientific reference and opportunities for solitude and self-reliant recreation.

The area will be managed according to the following wilderness management principles:

- restoration (if applicable) and protection of the unmodified state of the area and its plant and animal communities, while managing cultural heritage in a manner appropriate to its significance;
- preservation of the capacity of the area to evolve in the absence of significant human interference; and
- provision of opportunities for solitude and appropriate self-reliant recreation.

The general application of these principles will not exclude other necessary management activities, such as those required for appropriate fire and pest management. Key management trails in the Banyabba Wilderness will be maintained to allow access for management purposes.

3. PURPOSE OF RESERVING LAND AND MANAGEMENT PRINCIPLES

3.1 Management Purposes and Principles

National Parks

National parks are reserved under the NPW Act to protect and conserve areas containing outstanding or representative ecosystems, natural or cultural features or landscapes or phenomena that provide opportunities for public appreciation and inspiration and sustainable visitor use.

Under the Act, national parks are managed to:

- conserve biodiversity, maintain ecosystem functions, protect geological and geomorphological features and natural phenomena and maintain natural landscapes;
- conserve places, objects, features and landscapes of cultural value;
- protect the ecological integrity of one or more ecosystems for present and future generations;
- promote public appreciation and understanding of the park's natural and cultural values;
- provide for sustainable visitor use and enjoyment that is compatible with conservation of natural and cultural values;
- provide for sustainable use (including adaptive reuse) of any buildings or structures or modified natural areas having regard to conservation of natural and cultural values; and
- provide for appropriate research and monitoring.

Nature Reserves

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

Under the Act, 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; and
- provide for appropriate research and monitoring.

Nature reserves differ from national parks in that they do not have as a management principle to provide for visitor use.

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, that are capable of providing opportunities for sustainable visitor use and enjoyment, the sustainable use of buildings and structures, or research; and that are capable of providing opportunities for uses permitted under other provisions of the Act.

Under the Act, 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 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; and
- provide for appropriate research and monitoring.

3.2 Specific Directions for the Planning Area

Management will specifically focus on:

- management of the planning area as part of a regionally important system of protected areas along the Southern Richmond Range;
- recognition and protection of the Aboriginal values associated with the planning area in cooperation with representatives of the Bundjalung Aboriginal Nation;
- increasing the natural values of the reserve system over time;
- conservation of plant species and communities representative of the Kangaroo Creek Sandstone and Walloon Coal Measure geological formations;
- protection of plant species endemic to the Kangaroo Creek Sandstone geology, including *Grevillea banyabba*, *Acacia ruppii*, *Melichrus hirsutus*, *Eucalyptus pachycalyx* ssp. *banyabba* and *Grevillea quadricauda*;
- reducing the impacts of threatening processes, such as inappropriate fire regimes, weed and pest animal invasion and inappropriate recreational pursuits such as trail bike riding;
- provision of low-key and self-reliant nature based recreation that is consistent with the nature reserve and wilderness classification of much of the planning area; and
- promotion of the values of the reserve system to visitors, stakeholders, and neighbours.

4. CONSERVATION OF NATURAL LANDSCAPES

4.1 Geology, Landform, Hydrology and Soils

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. It consists of diverse landforms ranging from rocky mountainous escarpments to low elevation undulating terrain. Elevation ranges from around 10 metres in Gurranang 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 (M^cElroy 1962, 1969).

The slightly younger and more erodible Grafton Formation (composed of lithic sandstones, siltstone, claystone and minor coal) overlies the Kangaroo Creek Sandstone in the south-eastern corner of Fortis Creek National Park, along the eastern edge of Banyabba Nature Reserve and along the eastern edge of Banyabba State Conservation Area. Laurence Road, Kooyong and Corymbia State Conservation Areas all feature areas of Grafton Formation overlying the predominant Kangaroo Creek Sandstone. Grafton Formation overlies the entire area of Gurranang State Conservation Area, whilst Wombat Creek 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 comprised of coarse sandstone. The Walloon Coal Measures also form outcrops in the north-western 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 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 the Cabbage Tree Creek and the Six Mile Swamp Creek within the Mount Neville Nature Reserve. Management action will be required to prevent further access of stock to these areas.

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.

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.

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

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 for its outstanding natural catchment and river system values. 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.

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.

Guidelines and Actions

- Close and rehabilitate disturbed sites, such as old logging tracks and informal tracks and trails.
- Undertake weed control and encourage the revegetation of erosion gullies with appropriate native species and/or erosion control works, as necessary.
- Minimise soil erosion by ensuring NPWS management operations are carried out in accordance with best practice erosion and sediment control principles.
- Restrict the use of public vehicles accessing the management trail network.
- Discourage developments or activities that may compromise the natural, hydrological or scenic features of the planning area.
- Manage fire regimes in accordance with known fire frequency thresholds for vegetation species and communities in order to maintain protective vegetation cover on erodible soils (refer to *4.4 Fire Management*).

4.2 Native Plants

Given the former State Forest tenure of the majority of the planning area, 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 contains examples of old growth forest with several ecosystem types. Chapman's Peak Nature Reserve also contains examples of dry sclerophyll forest in old growth condition.

A number of vegetation surveys have been undertaken in the planning area since the 1970s. However, due to different survey methodology used, vegetation communities 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.

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 and Broadwater National Parks, to the protected areas of the M^cPherson Ranges on the NSW-QLD border (NPWS 2001a). This corridor includes NPWS estate along the northern part of the Richmond Range (refer to *1.1 Location, Regional Setting and Reservation*). The corridor assists in the migration of populations and the distribution of genetic material that is essential in maintaining species biodiversity.

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 NSW. The vegetation, soils and faunal assemblages of the planning area contain similarities to NPWS estate on sandstone geology to the north-west of Sydney, over 800 km to the south.

The variable topography, aspect, geology, and altitude of the planning area support a diverse range of vegetation, including dry sclerophyll, wet sclerophyll and rainforest communities (refer to *Appendix 1*).

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*), bastard tallowwood (*E. planchoniana*), forest red gum (*E. tereticornis*), spotted gum (*Corymbia maculata*), grey ironbark (*E. siderophylloia*), grey gum (*E. propinqua*), brown bloodwood (*Corymbia gummifera*), broad-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 brushbox (*Lophostemon confertus*), turpentine (*Syncarpia glomulifera*) and tallowwood (*Eucalyptus microcorys*). Wet sclerophyll forest associations of spotted gum and grey gum occur in Mount Pikapene National Park.

A large area of **dry rainforest** occurs on the west to south-west 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* - *Aracauria*) and a teak - hoop pine sub-alliance (*Flindersia* spp. - *Aracauria cunninghamii*).

Ten species listed as endangered and six species listed as vulnerable under the TSC Act have been recorded in the planning area (refer to *Appendix 2, Table 15*). Nine of these species are also listed as nationally endangered or vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (refer to *Appendix 2, Table 15*).

Fourteen species are classified as 'rare or threatened Australian plants' (ROTAP) (Briggs and Leigh 1995) (refer to *Appendix 2, Table 16*). A further fifteen flora species are listed as regionally significant (Sheringham and Westaway 1995). Some ROTAP and regionally significant species recorded in the planning area have particular conservation significance because they are found nowhere else and warrant specific protection (refer to *Appendices 1 and 2*).

Several of the restricted or threatened flora species recorded 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 ruppilii*), Banyabba shiny-barked gum (*Eucalyptus pachycalyx* ssp. *Banyabba*) and *Grevillea quadricauda*. Other sandstone endemics recorded in the planning area have a wider distribution, including the hairy melichrus (*Melichrus hirsutus*) and red-leaved daisy bush (*Olearia stillwelliae*).

Eight species recorded in the planning area are at their limit of geographical distribution, including the endangered square-stemmed spike-rush (*Eleocharis tetraquetra*). A large stand of cabbage tree palms (*Livistonia australis*) occur 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.

Inappropriate fire regimes are a threat to species diversity in the planning area. In particular, too frequent fire is a threat to the fire sensitive species endemic or restricted to the Glenreagh-Coaldale sandstone belt (part of the Kangaroo Creek sandstone complex) (refer to *Appendix 4*).

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 road sides 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 (refer to *6.1 Visitor Use, 6.4 Management Operations*). Some species, such as Rupp's Wattle appear to regenerate prolifically following fire and soil disturbance. Some degree of periodic disturbance may be beneficial to these species.

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

Desired Outcomes

- The full range of native vegetation species and communities within the planning area are conserved.
- The corridor value of the planning area is maintained.
- Knowledge of existing flora species and their ecological and management requirements is increased.

Guidelines and Actions

- Support the preparation and implementation of Recovery Plans for threatened flora species occurring in the planning area and relevant Threat Abatement Plans.
- Establish a rare, threatened and significant flora marker system to protect roadside specimens from damage during field operations. It may be necessary to erect fencing or other barriers to protect roadside populations from accidental and/or deliberate damage.

- Manage fire regimes in accordance with known fire frequency thresholds for vegetation species and communities, with particular attention to the protection of rare, threatened and significant flora (refer to 4.4 *Fire Management* and *Appendix 4*).
- Encourage research into the distribution, ecology and management requirements of flora species and communities within the planning area, with particular emphasis on threatened and restricted species and those most susceptible to impact from routine management operations (refer to 6.3 *Research and Monitoring*).
- Standardise vegetation mapping data for the planning area as part of any overall review of this information.
- Continue to update appropriate NPWS databases as new flora records within the planning area are obtained.
- Exclude grazing stock from the planning area (refer to 4.5 *Introduced Plants and Animals*).
- Allow/encourage disturbed areas, such as redundant trails and areas cleared for grazing or human habitation, to naturally regenerate. Supplement natural regeneration with weed control, site preparation and rehabilitation programs, using local genetic stock, where necessary. Priority will be given to the rehabilitation of the larger areas cleared for grazing and the larger quarry sites within Fortis Creek National Park (refer to 6.4 *Management Operations*).

4.3 Native Animals

The planning area is located within an area of overlap between the Torresian (tropical) and Bassian (temperate) bio-regions (SFNSW 1995). As a result, the planning area contains a variety of habitat types that support a diverse range of native animals.

Fauna surveys undertaken in the planning area (NRAC 1994, Clancy 1998, CRA 1998) have recorded 223 fauna species (49 mammals, 118 birds, 37 reptiles and 19 amphibians), including 31 threatened species listed under the TSC Act. Threatened fauna species are listed in *Appendix 3*. Important species include the black-striped wallaby (*Macropus dorsalis*), which is close to its limit of geographical range in the planning area, and the dragon lizard (*Diporiphora australis*), which until recently was not known to occur in NSW. 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).

The planning area contains some of the most diverse and significant mammal habitats in NSW (SFNSW 1995). In particular, the moist open forests are important habitats for the koala (*Phascolarctos cinereus*), nectar feeding 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 (*Pteropus poliocephalus*) are located in Banyabba Nature Reserve and Mount Neville Nature Reserve respectively (NPWS 1998a).

Twelve threatened species of insectivorous bats listed under the TSC Act have been recorded in the planning area. Mount Neville Nature Reserve contains an important roost site for the common bentwing-bat (*Miniopterus schreibersii*).

Threatened rainforest fauna in the planning area includes the sooty owl (*Tyto tenebricosa*), wompoo fruit-dove (*Ptilinopus magnificus*), rose crowned fruit-dove (*Ptilinopus regina*) and the giant barred frog (*Mixophyes iteratus*).

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

The NPWS Key Habitats and Corridors Project (NPWS 2001a) has identified several areas of key habitat for priority fauna in the Upper North Coast. Key habitat for species in the Moist Escarpment – Foothills and Dry Coastal Foothills fauna assemblages have 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 fauna assemblages. *Appendix 5* lists the species that make up each fauna assemblage.

Part of Mount Pikapene National Park has also been identified as a centre of endemism for invertebrate fauna (NPWS 2001a).

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 frequent fires result in destruction of tree hollow habitat and food trees. Fires during mating seasons also adversely impact on population succession (refer to *4.4 Fire Management*).

The glossy black-cockatoo (*Calyptorhynchus lathami*), listed as vulnerable under the TSC Act, is one such species that is threatened as a result of too frequent fire within the planning area, due to fire removing the key food species, forest oak (*Allocasuarina torulosa*) from the understorey.

Desired Outcomes

- The full range of native animals and their habitats within the planning area are conserved.
- The corridor value of the planning area for native fauna is maintained.
- Knowledge of existing fauna and their ecological and management requirements is increased.
- Threatening processes are identified and reduced.

Guidelines and Actions

- Support the preparation and implementation of Recovery Plans for threatened fauna species occurring in the planning area and relevant Threat Abatement Plans.
- Encourage research into the distribution, ecological requirements and management requirements of native fauna species and groups recorded in the planning area, with particular emphasis on threatened or restricted species and those most susceptible to impact from routine management operations (refer to *6.3 Research and Monitoring*).
- Continue to update appropriate NPWS databases as new fauna records are obtained for the planning area.
- Encourage and/or conduct fauna surveys in order to collect base line biological information and to detect ecological changes or trends.

4.4 Fire Management

The NPWS recognises that fire is a natural phenomenon influencing the Australian environment. Many species of Australian plants and animals have developed mechanisms or behaviour to survive fire, and some plants require fire for reproduction or stimulation of new growth. On the other hand, some vegetation communities such as rainforest are particularly sensitive to fire.

The frequency, intensity and extent of fire, and the season in which it occurs, are some of the major factors influencing the distribution of flora and fauna species and communities. Of particular concern is the influence these factors have on the ability of species to repopulate or recolonise fire-affected areas. Whilst these interactive processes are complex and not fully understood, fire frequency thresholds have been developed for broad vegetation types based on current knowledge of the life cycles and fire responses of plants (NPWS 2003a). These fire frequency thresholds will be used to determine broad scale fire regimes. Inappropriate fire frequencies have the potential to cause localised extinction of flora and fauna, including threatened species. Specific fire requirements of a number of threatened species are tabled in *Appendix 4*.

Records from the last 30 years show that a relatively high number of wildfires have occurred affecting large portions of the planning area¹. Many of these fires were lit off-park and moved on-park 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. If these fires escaped during periods of poor fire weather, they resulted in severe fire behaviour and damage to the values of the reserve system.

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 State Forests of NSW (SFNSW) and private forestry groups. The protection of these assets as well as those of the planning area requires a cooperative approach to fire management by NPWS, SFNSW, other agencies and adjacent landholders.

The NPWS is a fire authority under the *Rural Fires Act 1997* (RF Act) and has a responsibility to protect life and property and to prevent fires from leaving NPWS estate. This responsibility includes the implementation of fuel management programs, which include prescribed burning or mechanical removal of fuel. The NPWS may also assist with the control and suppression of fires on property adjacent to NPWS estate.

An important part of NPWS’ fire management is participation in Bushfire Management Committees. These Committees are responsible for preparing Bush Fire Risk Management and Operational Plans that detail operational arrangements, fuel management planning and also contain a resource directory.

The NPWS also prepares Reserve Fire Management Strategies for its estate, which are consistent with the Bush Fire Management Committee plans. A recent review of fire management by NPWS has resulted in a modified approach to fire planning based on the level of complexity involved.

¹ Records are of varying quality and conclusions from them have been drawn with caution. The records are likely to understate the frequency of past fires (Bushfire and Environmental Services 1998a).

In regard to the Southern Richmond Range Group of Reserves, the NPWS considers that sections of the planning area require separate map-based reserve fire management strategies, which are beyond the scope of this plan.

Reserve fire management strategies describe and analyse the bushfire environment and identify actions to reduce the threat of bushfire, protect life, property and natural and cultural heritage. These strategies are prepared in consultation with local fire management authorities and other relevant groups or individuals. Draft fire management strategies have been prepared for Mount Neville and Banyabba Nature Reserves and Fortis Creek National Park.

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 reserve system and adjacent lands.

Given the rugged topography of the planning area, fires, once ignited and 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 barriers 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 necessary to provide direction to fire-fighting personnel and to assist their safe access and egress from fire grounds, particularly during night operations. Directional signage naming management trails and denoting other important features such as water points will be provided throughout the planning area.

Desired Outcomes

- Life, property, natural and cultural values within and adjacent to the planning area are protected from bushfire.
- Fire management practices contribute to conserving and enhancing biodiversity values.
- Aboriginal sites, artefacts and historic remnants are protected from the impact of fire and fire related management activities.

Guidelines and Actions

- Prepare fire management strategies for all reserves, parks and conservation areas within the planning area. Prior to preparation of these strategies, the principles in the existing draft fire management strategies for Mount Neville and Banyabba Nature Reserves and Fortis Creek National Park will be used as a basis for fire management.
- Generally manage fire frequency in accordance with the NPWS Fire Interval Guidelines for Broad Vegetation Types (2003a). In addition, prescribed fire will be used to strengthen strategic fire control lines for protection of life and property in accordance with the fire management strategies.

- Continue participation in the Clarence and Richmond Valley Zone Bush Fire Management Committees to ensure cooperative fire management of the planning area and adjoining property.
- Encourage research into fire behaviour, hazard and risk assessment and the fire requirements of vegetation communities, fauna and rare, threatened and significant species for ongoing input to fire management strategies (refer to 6.3 *Research and Monitoring*).
- Continue liaison with neighbours to develop cooperative fuel and fire management practices.
- Include objectives and actions in fire planning and management programs for minimising threats to culturally significant sites and places arising from prescribed fires and wildfires (refer to 5 *Cultural heritage*).
- Work with local Aboriginal people in the preparation of fire management plans to ensure fire management activities do not impact on Aboriginal sites and/or places of significance (refer to 5.1 *Aboriginal Heritage*).
- Wherever possible, exclude fire from riparian zones to maintain ground vegetation to filter overland flow and minimise erosion.
- Implement management strategies as necessary to ensure that the following are not adversely impacted by fire or fire management activities:
 - sites and places of cultural heritage significance; and
 - rare, threatened and significant flora and fauna species, populations and communities (refer to *Appendix 4*).
- Maintain a system of trails for fire management and other management purposes (see Figures 1 and 2; refer to 6.4 *Management Operations*).
- In the event of an emergency, a situation analysis will be completed before any new vehicle trails are constructed within the planning area. The situation analysis will consider strategic requirements, environmental impact and rehabilitation options. Any trails constructed for temporary use during these circumstances will be closed and rehabilitated as soon as practicable after the incident.
- Install signage for management purposes and safety as required, such as the marking of management trails and water points required during incidents, or the marking of other significant items to prevent unintentional damage occurring in the course of management activities.

4.5 Introduced Plants and Animals

Introduced plants and animals have an impact on the natural environment through competition, replacement, predation, disturbance and the introduction of disease. Former and current land uses and disturbance such as grazing, road works, visitor use, logging and fire have provided opportunities for the introduction and invasion of non-native plants and animals.

The *Noxious Weeds Act 1993* requires NPWS to control noxious weeds so that they do not spread to neighbouring properties

Several noxious and environmental weeds are known to occur in the planning area (NPWS 2002, NPWS 2002a). Groundsel bush (*Baccharis halmifolia*), 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 Corbetts Water Hole clearing in Dilkoon Creek. Giant Parramatta grass (*Sporobolus fertilis*) occurs along trails in 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. Dense infestations of lantana (*Lantana camara*) exist in most parts of the planning area. The *Archontophoenix-Livistonia* palm forest on the south-western ridge below Mount Pikapene itself is under threat from weed invasion, particularly from lantana.

Approximately 30,000 slash pines (*Pinus elliotti*) occupy an area of 40 ha along Cabbage Tree Creek in Mount Neville Nature Reserve, including a dense area of 18 ha. 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 (refer to 5.2 *Historic Heritage*). The pines are out-competing native vegetation to form a monoculture in this area. Native species are also regenerating poorly in cleared former grazing areas in this reserve.

Several garden escapees, classified as environmental weeds, are located at Morgan's Camp and near the Dilkoon fire shed within Fortis Creek National Park. An infestation of Cats Claw Creeper (*Macfadyena unguis cati*), a highly invasive vine weed, occurs in Mt Pikapene National Park.

Introduced animals known to occur in the planning area include wild dogs (*Canis lupus familiaris*), foxes (*Vulpes vulpes*), feral cats (*Felis catis*), feral horses (*Equus caballus*), feral pigs (*Sus scrofa*) and rabbits (*Oryctolagus cuniculus*). The NPWS is responsible under the *Rural Lands Protection Act 1998* (RLP Act) to fully and continuously suppress and destroy pest animals found within the planning area, including rabbits, feral pigs and wild dogs.

Wild dogs and/or dingoes (*Canis lupus dingo*) are known to occur in the planning area and can inflict losses or disruption to livestock on adjoining lands. Although unprotected under Schedule 11 of the NPW Act, the dingo is a native animal and is regarded as an integral part of the planning area's natural systems. The continued survival of the dingo is endangered by cross breeding and feral dogs as well as eradication by humans.

Wild dogs, including feral dogs, dingoes and their hybrids, are declared pest animals under the RLP Act throughout NSW. Hence, the NPWS has a statutory obligation to control wild dogs on its estate, to the extent necessary to minimise the risk of the pest causing damage on any land.

Under the RLP Act, public lands which are identified as significant habitat for dingoes in Schedule 2 of the Wild Dog Control Order will be managed with the dual objectives of managing wild dogs while at the same time conserving populations of dingoes in core areas.

Mt Neville Nature Reserve, Banyabba Nature Reserve, Fortis Creek National Park and Banyabba State Conservation Area have been listed in Schedule 2 of the Control Order. The RLP Act requires public land managers, such as the NPWS, to assist in the preparation of a local wild dog management plan for Schedule 2 areas that addresses both control of wild dogs and the conservation of dingoes in core areas of the planning area. Before adoption and implementation the plans require the approval of all parties, including the Grafton and Casino Rural Lands Protection Boards (RLPB) and NPWS.

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 fauna for food, contributing to the spread of weeds along trails and around creeks, and increasing creek bank erosion and sedimentation. Cattle have been recorded within the north-east of Banyabba Nature Reserve, in the Cabbage Tree Creek area of Mount Neville Nature Reserve and along trails and spurs within the Mount Pikapene and Fortis Creek National Parks (NPWS 2002a).

More detailed information on the abundance and distribution of pest and weed species within the planning area will be provided in the Pest Management Plan for the Southern Richmond Range, which at the time of writing, is at a draft stage.

Further information on the distribution and abundance of introduced species in the planning area is required to develop effective pest control programs.

Desired Outcomes

- Introduced plants and animals are controlled, and where practicable eradicated.
- Increased information on the distribution, abundance and impact of introduced species in the planning area.
- Community awareness of the impacts from, and appropriate measures for control of, pest plants and animals is increased.

Guidelines and Actions

- Exclude non native grazing stock from the reserve system by liaising with neighbouring landholders, undertaking fencing agreements, and removing stock where necessary.
- Undertake weed and pest animal survey and mapping in the planning area.
- Prepare and implement weed and pest species management plans for the planning area.
- Pending the preparation of a pest species management plan, priority for pest control will be given to introduced species that:
 - are legally required to be controlled under the Noxious Weeds Act and RLP Act;
 - are significantly impacting on threatened species;
 - have a high capacity for dispersal or to displace native species;
 - are new isolated occurrences;
 - are causing unacceptable impacts on neighbouring lands; and

- are a vector for the spread of disease.
- Design pest control programs to avoid impacts on non-target species, in particular rare, threatened and significant species and communities.
- Undertake the following tasks, in the order listed, to restore the Cabbage Tree Creek area of Mount Neville Nature Reserve to a more natural state:
 - in consultation with SFNSW, 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;
 - following harvesting undertake rehabilitation works for the area.
- Control potentially invasive garden plantings at Morgan's Camp and around the Dilkoon Fire shed within Fortis Creek National Park.
- Assist in the preparation and implementation a wild dog management plan in consultation with relevant stakeholders including the Grafton and Casino RLPBs.
- Continue to liaise with Far North Coast Weeds and Clarence Valley Weed Authority, the Grafton and Casino RLPBs and neighbours regarding coordinated pest control programs.
- 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 (refer to *6.3 Research and Monitoring*).
- NPWS may approve the use of horses to muster and remove stock on a case by case basis if necessary.
- Provide information to the community regarding the impacts of introduced species and encourage off-park control programs to assist conservation of native animal populations.

5. CONSERVATION OF CULTURAL HERITAGE

5.1 Aboriginal Heritage

The planning area is part of a landscape of cultural importance to the Bundjalung Aboriginal nation, and falls within the jurisdictions of the Jubullum, Jana-Ngalee, Casino-Boolangle, Bogal, Baryulgil, Grafton-Ngerrie and Yaegl Local Aboriginal Land Councils.

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 and 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 and Lomax 1993). Byrne (1987) suggests that mountainous landscapes in particular are of cultural value to Aboriginal people, as these often “untouched” areas provide a link to the traditional landscape.

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.

A rock art shelter in Mount Neville Nature Reserve is listed on the Register of National Estate. The dry pigment art style, the types and figures represented, colours used and the drawing technique are representative of the Clarence Valley art style. 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. A conservation report was prepared for the site (NPWS 1998b) and conservation works were undertaken in accordance with this plan in 2002.

The planning area is currently subject to two registered native title claims on behalf of the following Aboriginal people:

- The Baryulgil Bundjalung people (NC96/008) which includes the northern part of Banyabba Nature Reserve and southern part of Mount Neville Nature Reserve; and;
- The Bandjalang people #2 (NC98/019) which includes the eastern part of Banyabba Nature Reserve.

Whilst the NPWS has a legal responsibility for management of Aboriginal sites and objects under the NPW Act, the NPWS recognises the right of the Aboriginal community to be included in decisions about their own heritage. In this regard, the NPWS adopts a collaborative approach to the management of Aboriginal cultural values associated with the planning area, through ongoing consultation with the Aboriginal community.

Desired Outcomes

- Aboriginal cultural values are recognised and protected in partnership with the Aboriginal community.

Guidelines and Actions

- Manage the Aboriginal cultural values of the planning area with the involvement of the local Aboriginal community, including relevant Local Aboriginal Land Councils (LALC), Native Title claimants and holders, Elders Councils and other Aboriginal representatives.
- Encourage local Aboriginal people to take part in park management by meeting with Local Aboriginal Land Councils and Elders groups when developing management plans such as reserve plans of management and fire management strategies.
- Investigate opportunities for the employment of local Aboriginal people in park management.
- Record and protect Aboriginal sites, places of significance and other values associated with the planning area in consultation with the Aboriginal community.
- Inspect the art shelter in Mount Neville Nature Reserve every three years for signs of disturbance in conjunction with the Bogal LALC and undertake protective works as necessary.
- Encourage further research and surveys into the identification of Aboriginal sites, places and other values with the involvement of the Aboriginal community (refer to *6.3 Research and Monitoring*).

5.2 Historic Heritage

Records of European occupation in the area, mainly for 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).

A former cattle tick quarantine boundary fence traverses parts of Banyabba and Mount Neville Nature Reserves 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 NSW and contain the southward spread of the tropical cattle tick. A number of houses were built along this fence line to accommodate tick inspectors. The tick fence was patrolled and maintained up until 1994, after which stock movement restrictions were lifted. Sections of the now defunct 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.

Most parts of the planning area were selectively harvested for hardwood during the 1940s and 1950s under former State Forest tenure. More intensive harvesting operations occurred during the 1960s. There are no known remains of heritage significance from this previous landuse within the planning area.

Part of Mount Neville Nature Reserve in the Cabbage Tree Creek valley was formerly freehold land. This area (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. A number of introduced pines were planted in the vicinity of the 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 (refer to *4.5 Introduced Plants and Animals*).

Mount Pikapene National Park, Banyabba Nature Reserve and Fortis Creek National Park are valued culturally and aesthetically as part of the Richmond Range and the Clarence and Richmond River systems (refer to *4.1 Geology, Landform, Hydrology and Soils*).

Desired Outcomes

- Features of historic significance are identified, recorded and protected.

Guidelines and Actions

- Encourage research into early-European use and historic sites in the planning area.
- Record, assess existing items of early European occupation such as:
 - the cattle tick quarantine fence lines and associated infrastructure in Banyabba and Mount Neville Nature Reserves and Mount Pikapene National Park;
 - the site of the former homestead on Cabbage Tree Creek in Mount Neville Nature Reserve.
- Protect historic sites identified as having significant cultural or historic value.
- Structures and disturbances assessed as having little cultural or historic value e.g. cattle dip sites and clearings, will be recorded, and where necessary removed and the site rehabilitated (refer to *6.4 Management Operations*).

6. USE OF THE PLANNING AREA

6.1 Visitor Use

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 recreation opportunities.

Low levels of self-reliant activities such as remote bushwalking, bush camping and nature observation occur within the planning area. The management trails of the planning area have also been used for cycling, trail bike riding and four-wheel driving, particularly in Fortis Creek National Park and Banyabba Nature Reserve.

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 2).

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. The nature reserve classification of much of the planning area, does not promote recreation as a primary management objective (refer to *2.1 Legislation and Policy Framework*);
- a range of recreational facilities and opportunities are provided in nearby national parks, State Forests, other public land tenures and private property;
- access roads and trails within the planning area are based on erodible soils that will not sustain high levels of vehicle use; and
- the provisions of the Wilderness Act preclude activities other than low impact, self reliant activities from occurring in wilderness areas. Public vehicle access, horse riding and visitor facilities are not permitted in wilderness (refer to *2.1 Legislation & Policy Framework, 2.3 Wilderness*).

Public vehicle access

Public vehicle access to the planning area is via the Summerland Way and Coaldale Road (refer Figures 1 and 2). Access to the boundary of individual reserves is detailed in Table 2.

Table 2. Public Vehicle Access to the Planning Area Boundary.

Reserve	Access
Mount Pikapene National Park	Busby's Flat Road
Mount Neville Nature Reserve	No public access
Banyabba Nature Reserve	Back Forest Road
Banyabba State Conservation Area	Back Forest Road
Chapman's Peak Nature Reserve	Lankey Creek Road
Fortis Creek National Park	Summerland Way; Coaldale Road
Kooyong State Conservation Area	Oil Well Road
Laurence Road State Conservation Area	Pringles Way
Gurranang State Conservation Area	Summerland Way
Corymbia State Conservation Area	Summerland Way
Wombat Creek State Conservation Area	No public access

The road network associated with the planning area has a number of different tenures. 'Public roads' (called roads on map) are outside or adjoining the planning area (eg Busbys Flat Road and Wongabeena Road) that are managed by other authorities such as Clarence Valley Council. 'Park roads' are available for public vehicle access and are generally managed by NPWS, except where easements or other access provisions apply. 'Management trails' are maintained to a lower standard than park roads and are essentially for fire and weed management by NPWS. 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 usage.

Vehicle access to parts of the planning area, such as Mount Neville Nature Reserve and Wombat Creek State Conservation Area, is via roads on adjoining private property which are not promoted for use by the public (refer to *6.4 Management Operations*). In most cases Crown road reserves do not traverse private property, or roads in use do not align with the easements provided.

Table 3. Park Roads within the Planning Area.

Reserve	Park Road
Mount Pikapene National Park	Forty Acres Road
Banyabba State Conservation Area	Back Forest Road Ogilvie Road Western Powerline Trail (4WD only)
Banyabba Nature Reserve	Part of Mount Neville Road (between Mount Marsh Road and Ebellings Road)
Fortis Creek National Park	Dilkoon Road (to the intersection of Centre Trail) Swallow Road
Corymbia State Conservation Area	Corymbia Fire Trail

There are no park roads within the Banyabba Wilderness as 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 the Dilkoon Road in the southern part of Fortis Creek National Park, or through the Banyabba State Forest and State Conservation Area to the north. Pedestrian access is also available from Coaldale Road to the west.

Given the erodibility of the dominant soil types and the steepness of the terrain within the planning area, unrestricted public use of four-wheel drive vehicles and trail bikes has the potential to cause considerable damage to management trails. This unrestricted use has already resulted in unacceptable levels of erosion, particularly in the highly erodible sandstone areas. This damage can result in restricted access to the NPWS and other fire authorities during wildfire events. Vegetation adjacent to trails and off trails has also been damaged, in some cases damaging threatened plant species. Trail bike riding activities in particular are having significant impacts on the management trails and native vegetation within Fortis Creek National Park and Banyabba Nature Reserve.

Bush walking

It is considered that bushwalking opportunities can be sustained in the planning area, based on use of the existing management trail system. 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

It is considered that cycling can be sustained on management trails and park roads within the planning area outside the Banyabba Wilderness. Cycling within wilderness areas is generally not permitted under NPWS policy.

Camping

Self-reliant pack or bush camping is undertaken throughout the planning area, including in the Banyabba Wilderness. No formal camping areas or facilities are provided and campers are responsible for containing and removing their own rubbish. Camping areas with facilities are provided in the nearby Mt Pikapene State Forest, and Toonumbar, Ramornie, Bundjalung, Yuraygir, Richmond Range and Nymboi-Binderay National Parks.

Horse riding

Recreational horse riding is not permitted in the planning area as it is not considered an appropriate use due to the potential for negative impacts, including increased compaction and erosion of fragile sandstone soils that dominate the planning area and the potential to spread and introduce weeds. NPWS policy does not allow horse riding in nature reserves or wilderness areas.

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.

Commercial or group activities

There are currently no commercial recreational activities conducted in the planning area. All commercial activities proposed to be conducted in the planning area require a licence from the NPWS. Group activities require the consent of the Regional Manager. 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.

Desired Outcomes

- Visitor use is sustainable.
- Recreation activities are low-key, self-reliant, and compatible with reserve values and legislative principles.

Guidelines and Actions

- Formal visitor facilities or camping areas will not be developed within the planning area.
- If visitor use impacts to natural or cultural values and other users are unsustainable, casual activities will be restricted or prohibited.

Public vehicle access

- Public vehicle access will be allowed on designated park roads in the planning area as listed in Table 3 and shown in Figures 1 and 2.
- Park roads will generally be maintained to dry-weather two-wheel drive standard. Access may be restricted during periods of wet weather.
- Install signage, gates and bollards as necessary to restrict public vehicle access to the management trail system and the Banyabba Wilderness (refer to 6.4 *Management Operations*).
- Create a vehicle turn-around at the intersection of the Dilkoon Road and Centre Trail as public vehicle access is not permitted in the Banyabba Wilderness (see Figure 1).

Bush walking

- Bushwalking will be permitted throughout the planning area.

Cycling

- Cycling will be permitted on park roads and management trails within the planning area outside of the Banyabba Wilderness, and subject to group size limits.

Camping

- Promote a minimal impact camping and a 'no trace' camping ethic.
- Permit pack or bush camping within the planning area. Camping will not be permitted within 200 metres of watercourses, in erosion prone areas and in vegetation rehabilitation areas.

Horse riding

- Exclude horse riding within the planning area.

Commercial or group activities

- Assess commercial and group activity applications with respect to impacts to natural and cultural values. Activities deemed to have a significant or unsustainable impact will not be permitted.
- Visitor group size limits apply within the planning area unless the prior written consent of the North Coast Regional Manager is obtained. Group sizes are limited to 10 persons within the Banyabba Wilderness, and to 20 persons within the planning area outside of the Banyabba Wilderness.

6.2 Information and Education

The development of effective visitor interpretation and education programs can improve public understanding, perception and enjoyment of the planning area. Programs can be designed to promote conservation and the understanding of natural and cultural heritage values. This includes the NPWS Discovery program and the production of interpretive material. Minimal-impact recreation can also be promoted through these media.

Any promotion of the planning area must be compatible with the access provisions provided in this plan (refer to *6.1 Visitor Use*), wilderness management principles for wilderness areas (refer to *2.1 Legislation & Policy Framework, 2.3 Wilderness*) and the conservation of threatened species (refer to *4.2 Native Plants; 4.3 Native Animals*) and cultural values (refer to *5.1 Aboriginal Heritage; 5.2 Historic Heritage*).

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.

Desired Outcomes

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

Guidelines and Actions

- Provide visitor information detailing the significant natural and cultural values of the planning area on the NPWS website and through other media as opportunities arise and resources allow.
- Provide information explaining the principles behind NPWS management programs to neighbours and stakeholders.
- Advise local tourism information outlets, local government authorities, recreation groups, SFNSW and other relevant recreation providers of visitor opportunities available in the planning area (refer to *6.1 Visitor Use*).
- Provide information on Fortis Creek National Park and Banyabba Nature Reserve at the intersection of the Dilkoon Road and the Summerland Way (see Figure 1).

- Erect interpretive signage at the boundary of the Banyabba Wilderness on Banyabba Trail, Saltwater Trail, Dilkoon Road, 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 wilderness area.
- Investigate opportunities to conduct interpretive or educational activities, such as the NPWS Discovery program, in the planning area. Any activities proposed for the Banyabba Wilderness area must be compatible with wilderness management principles (refer to *2.1 Legislation & Policy Framework, 2.3 Wilderness*).
- Consult with, and inform, park neighbours of forthcoming management programs, such as fire and pest management activities.
- Review and update other sources of visitor information regarding the planning area, as necessary.

6.3 Research and Monitoring

Research is important for the conservation of significant natural and cultural values of the planning area and assists the development of best management practices.

As previously discussed, the planning area is significant for its landscape, geological and topographic features, as well as its flora, fauna and cultural heritage values. Previous land use and management practices have influenced the condition of these values. Research and monitoring of changes in these values over time will assist in determining future management actions to conserve these values.

The occurrence of many threatened species, the recent discovery of undescribed taxa and the potential for additional undescribed taxa to exist, highlights the need for further research in the planning area. Research is required to assess the impact of current management practices on species and ecological communities. This research will be important in formulating appropriate management practices for the future.

Research priorities include:

- Use existing studies and conduct further flora survey/research to produce a vegetation map based on one vegetation classification system, of appropriate detail to guide management.
- Identify key threatening processes to threatened flora species, populations or communities, ie. research the distribution, ecology and management requirements of plant species of conservation significance, such as *Acacia ruppii*, *Angophora robur*, *Eleocharis tetraquetra*, *Eucalyptus pachycalyx* ssp. Banyabba and *Melichrus hirsutus*, and their response to threats such as fire and introduced species.
- Use existing studies and conduct further survey/research to obtain information on the spatial distribution of fauna species and population dynamics with appropriate detail to guide management planning.
- Identify key threatening processes to threatened fauna species or populations, ie. research the distribution, ecology and management of fauna species of conservation significance, such as the glossy black-cockatoo, parma wallaby, rufous bettong and brush-tailed phascogale and their response to threats such as fire and introduced species.
- Use existing information and undertake further surveys/ research to determine the location of significant sites and document why the planning area is of significance to Aboriginal cultural heritage.

- Identify key threatening processes and specifically identify Aboriginal cultural heritage sites vulnerable to damage/destruction from management activities such as road and trail maintenance works.
- Define the ecological requirements of flora and fauna types within the planning area for fire and thereby provide base line information on which to determine appropriate fire regimes, analyse fire behaviour, predict bush fire hazard and undertake risk assessment.

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

Under the North East RFA (refer to *2.1 Legislation and Policy Framework*), all forest managers including the NPWS must demonstrate ecologically sustainable forest management (ESFM). ESFM is an over-riding management principle and will be applied to all ecosystem types. It will be implemented primarily through monitoring to provide feedback on management programs and directions for future management. Performance indicators of ESFM have been identified. Monitoring programs will be developed using these indicators to demonstrate the impact of management actions on ecological functions. Remedial management actions will then be undertaken as required.

Desired Outcomes

- Research and monitoring provides information which consolidates or improves existing knowledge of the planning area and increases the understanding of the natural processes and natural and cultural values of the planning area.
- Research contributes to best practice management and attainment of ESFM.

Guidelines and Actions

- Undertake and encourage appropriate research in the planning area that will assist to define and conduct best management practice, in accordance with the priorities identified above.
- Record research data and findings in appropriate NPWS databases and libraries.

6.4 Management 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, management trails are only available for NPWS management activities and pedestrian use by the public (refer to *6.1 Visitor Use*).

The planning area includes a number of 'Ministerial Roads'. The management of these roads is vested with the Minister for the Environment on behalf of the Crown. These roads were established to ensure the continuation of access arrangements that existed immediately before gazettal. This primarily relates to use of these roads for timber hauling from the adjoining State Forest and access to private property. Whilst Ministerial Roads do not form part of the gazetted park area, these roads are subject to the provisions of this plan, the National Parks and Wildlife Regulation and the requirements of the EPA Act.

NPWS will contribute to the management of these roads with the appropriate parties. Where applicable Memorandums of Understanding (MOUs) will be developed to document these arrangements. There are nine Ministerial roads in the planning area, as shown in Table 4.

The 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 as it falls within the Banyabba Wilderness.

The Corymbia Fire Trail within Corymbia State Conservation Area is currently a Ministerial Road that provides for access to private property and a quarry. It is recommended that this road be retained outside the reserve system under any review of access arrangements, in order to maintain public vehicle access to this road.

Table 4. Ministerial Roads in the Planning Area.

Park or Reserve Name	Road/Trail Name	Access Type	Reservation Purpose
Mount Pikapene NP	Tower Trail	Management Trail	Fire lookout access
	Sugarloaf Road	Management Trail	Access to SFNSW for management/harvesting purposes
	Forty Acres Road	Park Road	Access to SFNSW for management/harvesting purposes
	Pikapene Road	Management Trail	Access to SFNSW for management/harvesting purposes
	Coffee Creek Road	Management Trail	Access to SFNSW for management/harvesting purposes
Mount Neville NR	Part of Fullers Trail	Management Trail	Access to SFNSW for management/harvesting purposes
Banyabba NR	Mount Neville Road	Park Road	Access to SFNSW for management/harvesting purposes
	Part of Mount Marsh Road	Management Trail	Access to SFNSW for management/harvesting purposes
Fortis Creek NP	Morgans Camp Trail	Management Trail	Access to former inholding
Corymbia SCA	Corymbia Fire Trail	Park Road	Access to private property and quarry

Numerous road reserves dissect the Gurrang State Conservation Area, thereby creating numerous tenure boundaries within a very small area (see Figure 1). The requirement for these road reserves needs to be reviewed and negotiations with the Department of Lands undertaken to revoke any unnecessary road reserves and add them to the state conservation area.

The Lardner-Banyabba Link Trail, located on the northern boundary of Banyabba Nature Reserve 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. This trail will require specific works to maintain the access for fire management purposes.

Past Disturbance

A derelict house and associated structures exist at Morgan's Camp, a former in-holding of approximately 40 ha within Fortis Creek National Park. The house and structures were erected in recent years and have no heritage value. The structures have been subject to severe vandalism and theft. There are also a number of potentially invasive garden plants around the house and yard area. It is proposed to remove the structures and remove introduced and potentially invasive plants from the site. Approx 15 ha of this purchase has previously been cleared for grazing and will be allowed to regenerate back to forested land.

There are also two dams at Morgan's Camp. One dam is in good repair and will be retained for use in fire management. The second dam, closer to the house site, is in very poor condition and will not be maintained. This site may require rehabilitation to prevent further erosion.

Land between Fullers State Forest and Mount Neville Nature Reserve has been purchased and will be gazetted as an addition to Mount Neville Nature Reserve. Significant parts of this land have been cleared for grazing. The NPWS will monitor the re-generation of this area. This area may require active management to ensure appropriate regeneration of native species occurs.

A number of disused quarries exist in the planning area. The two largest of these are located near the entrance to Morgans Camp Trail along the Coaldale Road, and on the Dilkoon Road in Fortis Creek National Park. The remaining stockpiles of material from the quarries will be used for road maintenance within the planning area. The quarries may be further shaped to restore a more natural landscape and rehabilitated as resources allow.

Non-NPWS uses

The European honeybee is an exotic species that has adverse impacts upon some native biota. Impacts upon native plants and animals depend upon the type and abundance of native species present, the climate or season, the number of hives in an area and the frequency with which the sites are used. Apiary sites exist in parts of the planning area, including six apiary sites in Mount Pikapene National Park, four sites in Banyabba Nature Reserve, two sites in Banyabba State Conservation Area and nine sites in Fortis Creek National Park. These sites and associated licences are managed in accordance with NPWS policy. No apiary sites are located within the Banyabba Wilderness. Under the NPWS Wilderness Policy, apiaries within the Banyabba Wilderness have been relocated outside the wilderness area in consultation with licensees.

There are a number of other non-NPWS land uses in the planning area that pre-date gazettal. These non-NPWS uses are classified as 'existing interests' under Section 39 of the NPW Act if they were legally approved prior to gazettal. Existing interests in the planning area include the Dilkoon Fire Brigade shed managed by Copmanhurst Shire Council, which is located within Fortis Creek National Park, as well as electricity transmission lines managed by Country Energy and high voltage electricity transmission lines managed by TransGrid.

The Country Energy transmission lines traverse Fortis Creek National Park and Banyabba, Gurrang and Corymbia State Conservation Areas. The TransGrid lines traverse Fortis Creek National Park and Banyabba and Corymbia State Conservation Areas (see Figure 1).

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 state-wide agreement between TransGrid and the NPWS for inspection and maintenance of existing transmission lines and infrastructure was implemented in October 2002. Formal easements for these existing uses have not yet been granted under the NPW Act, although in some cases, infrastructure easements were excluded from the planning area at the time of gazettal.

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 where they have no significant cultural value.
- Infrastructure within the planning area is appropriate for management requirements.
- Existing non-NPWS related uses and activities are managed, to minimise impacts on planning area values.

Guidelines and Actions

Roads, trails and additions to the planning area

- Maintain a strategic network of management trails (see Figures 1 and 2) to a dry weather four-wheel drive standard. Trails will be signposted to provide direction and gates or bollards installed, where necessary to prevent unauthorised vehicle access. All other trails will be closed and rehabilitated.
- Close tracks no longer required for management purposes and allow them to regenerate naturally. If supplementary erosion control works become necessary, these will be undertaken as required.
- Negotiate a Memorandum of Understanding with SFNSW and other relevant stakeholders regarding the cooperative maintenance and use of Ministerial Roads.
- Pursue gazettal of Morgans Camp Trail as part of Fortis Creek National Park.
- Recommend Corymbia Fire Trail not be gazetted as part of Corymbia State Conservation Area.
- Review the requirement for road reserves within the Gurrang State Conservation Area and negotiate to gazette surplus road reserves as part of the conservation area.
- Where Crown road access to NPWS estate does not exist, the NPWS will negotiate access arrangements with relevant neighbours to enable the NPWS to access the planning area for management purposes.
- Assess the feasibility of upgrading or providing an alternative alignment of the Banyabba Link Trail and implement the recommendations arising from this assessment.

Internal infrastructure

- Remove the house and associated structures at Morgan's Camp, within Fortis Creek National Park. Monitor the regeneration of this area, and undertake appropriate regeneration of native species if required.
- Maintain the large dam at Morgan's Camp within Fortis Creek National Park for fire management purposes. Allow and /or encourage natural regeneration of the smaller dam.
- Close and rehabilitate quarries following the removal of remaining stockpiles of material for road maintenance.
- Progressively rehabilitate disused quarry sites using local soils and plants from local genetic stock (refer to *4.2 Native Plants*). Priority will be given to the rehabilitation of the larger quarry sites within Fortis Creek National Park (refer to *6.4 Management Operations*).
- Allow disturbed areas, such as areas cleared for grazing and redundant trails, to regenerate naturally. Supplement natural regeneration with weed control, site preparation and rehabilitation works where necessary. Seed for regeneration works will be collected locally (refer to *4.2 Native Plants*).

Non-NPWS uses

- Continue to license and manage all existing apiary sites within the planning area in accordance with NPWS policy. Any existing apiary sites that significantly compromise the environmental or recreational values of an area will be relocated in consultation with licensees.
- Develop agreements with apiarists for management and maintenance of apiary sites. Where possible, apiary site access tracks are to be maintained by slashing to minimise soil disturbance.
- Review the status of existing non-NPWS related uses. Undertake negotiations to grant licences, leases or easements for legally existing developments under the provisions of the NPW Act and seek proper commercial returns for these uses where appropriate. Monitor these uses annually to ensure any associated impacts are appropriately managed.

7. PLAN IMPLEMENTATION

This plan of management is part of a system of management developed by the NPWS. The system includes the NPW Act, field management policies, established conservation and recreation philosophies and strategic planning at corporate, directorate and regional levels. The latter may include development of related plans such as regional recreation plans, species recovery plans, threat abatement plans, fire management plans and conservation plans.

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

Implementation of this plan will be undertaken within the annual programs of the NPWS North Coast Region. Relative priorities for identified activities are set out in the table below (Table 5). These priorities are determined in the context of directorate and regional strategic planning, and are subject to the availability of necessary staff and funds and to any special requirements of the Director-General or Minister for the Environment.

The environmental impact of proposed activities will be assessed at all stages in accordance with established environmental assessment procedures. Where the potential impacts of a proposed activity are found to be unacceptable, the activity may be modified or rejected, in accordance with the plan and NPWS policies. Ongoing assessment and monitoring may also result in the modification of activities, where practicable, in response to identified impacts.

This plan of management will stay in force until amended or replaced in accordance with section 73(B) of the Act. Implementation of the plan will be monitored and its success in achieving the identified objectives will be periodically assessed.

As a guide to the orderly implementation of this plan, actions identified in this plan are prioritised within the following categories:

HIGH: Actions which are imperative to the achievement of the management objectives set out in this plan and/ or which need to be implemented in the near future. In general not undertaking the works may result in unacceptable degradation of natural and cultural values, and add significantly to the costs associated with rehabilitation, or present an unacceptable risk to public safety.

MEDIUM: Actions that are necessary to achieve the management objectives set out in this plan, but will be undertaken as resources become available since the time frame for their implementation is not so critical.

LOW: Actions which are desirable to achieving the management objectives set out in this plan, but can wait until resources are available.

Table 5: Implementation

4. Conservation of Natural Landscapes		
Section	Action	Priority
4.1 Geology, Landform, Hydrology and Soils	<ul style="list-style-type: none"> • Close and rehabilitate disturbed sites, such as old logging tracks and informal tracks and trails. 	Medium
	<ul style="list-style-type: none"> • Undertake weed control and encourage the revegetation of erosion gullies with appropriate native species and or erosion control works, as necessary. 	Medium
	<ul style="list-style-type: none"> • Minimise soil erosion by ensuring NPWS management operations are carried out in accordance with best practice erosion and sediment control principles. 	High
	<ul style="list-style-type: none"> • Restrict the use of public vehicles accessing the management trail network. 	High
	<ul style="list-style-type: none"> • Discourage developments or activities that may compromise the natural, hydrological or scenic features of the planning area. 	High
	<ul style="list-style-type: none"> • Manage fire regimes in accordance with known fire frequency thresholds for vegetation species and communities in order to maintain protective vegetation cover on erodible soils (refer to <i>4.4 Fire Management</i>). 	High
4.2 Native Plants	<ul style="list-style-type: none"> • Support the preparation and implementation of Recovery Plans for threatened flora species occurring in the planning area and relevant Threat Abatement Plans. 	High
	<ul style="list-style-type: none"> • Establish a rare, threatened and significant flora marker system to protect roadside specimens from damage during field operations. It may be necessary to erect fencing or other barriers to protect roadside populations from accidental and/or deliberate damage. 	High
	<ul style="list-style-type: none"> • Manage fire regimes in accordance with known fire frequency thresholds for vegetation species and communities, with particular attention to the protection of rare, threatened and significant flora (refer to <i>4.4 Fire Management</i> and <i>Appendix 4</i>). 	High
	<ul style="list-style-type: none"> • Encourage research into the distribution, ecology and management requirements of flora species and communities within the planning area, with particular emphasis on threatened and restricted species and those most susceptible to impact from routine management operations (refer to <i>6.3 Research and Monitoring</i>). 	High
	<ul style="list-style-type: none"> • Standardise vegetation mapping data for the planning area as part of any overall review of this information. 	Low
	<ul style="list-style-type: none"> • Continue to update appropriate NPWS databases as new flora records within the planning area are obtained. 	Medium
	<ul style="list-style-type: none"> • Exclude grazing stock from the planning area (refer to <i>4.5 Introduced Plants and Animals</i>). 	Medium

Section	Action	Priority
	<ul style="list-style-type: none"> Allow/encourage disturbed areas, such as redundant trails and areas cleared for grazing or human habitation, to naturally regenerate. Supplement natural regeneration with weed control, site preparation and rehabilitation programs, using local genetic stock, where necessary. Priority will be given to the rehabilitation of the larger areas cleared for grazing and the larger quarry sites within Fortis Creek National Park (refer to <i>6.4 Management Operations</i>). 	Medium
4.3 Native Animals	<ul style="list-style-type: none"> Support the preparation and implementation of Recovery Plans for threatened fauna species occurring in the planning area and relevant Threat Abatement Plans. Encourage research into the distribution, ecological requirements and management requirements of native fauna species and groups recorded in the planning area, with particular emphasis on threatened or restricted species and those most susceptible to impact from routine management operations (refer to <i>6.3 Research and Monitoring</i>). Continue to update appropriate NPWS databases as new fauna records are obtained for the planning area. Encourage and/or conduct fauna surveys in order to collect base line biological information and to detect ecological changes or trends. 	High High Medium Medium
4.4 Fire Management	<ul style="list-style-type: none"> Prepare fire management strategies for all reserves, parks and conservation areas within the planning area. Prior to preparation of these strategies, the principles in the existing draft fire management strategies for Mount Neville and Banyabba Nature Reserves and Fortis Creek National Park will be used as a basis for fire management. Generally manage fire frequency in accordance with the NPWS Fire Interval Guidelines for Broad Vegetation Types (2003a). In addition, prescribed fire will be used to strengthen strategic fire control lines for protection of life and property in accordance with the fire management strategies. Continue participation in the Clarence and Richmond Valley Zone Bush Fire Management Committees to ensure cooperative fire management of the planning area and adjoining property. Encourage research into fire behaviour, hazard and risk assessment and the fire requirements of vegetation communities, fauna and rare, threatened and significant species for ongoing input to fire management strategies (refer to <i>6.3 Research and Monitoring</i>). Continue liaison with neighbours to develop cooperative fuel and fire management practices. 	High High High Medium High

Section	Action	Priority
	<ul style="list-style-type: none"> • Include objectives and actions in fire planning and management programs for minimising threats to culturally significant sites and places arising from prescribed fires and wildfires (refer to 5 <i>Cultural heritage</i>). • Work with local Aboriginal people in the preparation of fire management plans to ensure fire management activities do not impact on Aboriginal sites and/or places of significance (refer to 5.1 <i>Aboriginal Heritage</i>). • Wherever possible, exclude fire from riparian zones to maintain ground vegetation to filter overland flow and minimise erosion. • Implement management strategies as necessary to ensure that the following are not adversely impacted by fire or fire management activities: <ul style="list-style-type: none"> - sites and places of cultural heritage significance; and - rare, threatened and significant flora and fauna species, populations and communities (refer to <i>Appendix 4</i>). • Maintain a system of trails for fire management and other management purposes (see Figures 1 and 2; refer to 6.4 <i>Management Operations</i>). • In the event of an emergency, a situation analysis will be completed before any new vehicle trails are constructed within the planning area. The situation analysis will consider strategic requirements, environmental impact and rehabilitation options. Any trails constructed for temporary use during these circumstances will be closed and rehabilitated as soon as practicable after the incident. • Install signage for management purposes and safety as required, such as the marking of management trails and water points required during incidents, or the marking of other significant items to prevent unintentional damage occurring in the course of management activities. 	<p>High</p> <p>High</p> <p>High</p> <p>High</p> <p>High</p> <p>Medium</p> <p>High</p>

Section	Action	Priority
4.5 Introduced Plants and Animals	<ul style="list-style-type: none"> Exclude non native grazing stock from the reserve system by liaising with neighbouring landholders, undertaking fencing agreements, and removing stock where necessary (refer to 4.2 <i>Native Plants</i>; 4.3 <i>Native Animals</i> and 6.4 <i>Management Operations</i>). 	Medium
	<ul style="list-style-type: none"> Undertake weed and pest animal survey and mapping in the planning area. 	High
	<ul style="list-style-type: none"> Prepare and implement weed and pest species management plans for the planning area (refer to 6.4 <i>Management Operations</i>). 	High
	<ul style="list-style-type: none"> Pending the preparation of a pest species management plan, priority for pest control will be given to introduced species that: <ul style="list-style-type: none"> - are legally required to be controlled under the Noxious Weeds Act and RLP Act; - are significantly impacting on threatened species; - have a high capacity for dispersal or to displace native species; - are new isolated occurrences; - are causing unacceptable impacts on neighbouring lands; and - are a vector for the spread of disease. 	High
	<ul style="list-style-type: none"> Design pest control programs to avoid impacts on non-target species, in particular rare, threatened and significant species and communities. 	High
	<ul style="list-style-type: none"> Undertake the following tasks, in the order listed, to restore the Cabbage Tree Creek area of Mount Neville Nature Reserve to a more natural state: <ul style="list-style-type: none"> - in consultation with SFNSW, 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; - following harvesting undertake rehabilitation works for the area. 	High
	<ul style="list-style-type: none"> Control potentially invasive garden plantings at Morgan's Camp and around the Dilkoon Fire shed within Fortis Creek National Park (refer to 6.4 <i>Management Operations</i>). 	Medium
	<ul style="list-style-type: none"> Assist in the preparation and implementation of a wild dog management plan in consultation with relevant stakeholders including Grafton and Casino RLPBs. 	Medium
	<ul style="list-style-type: none"> Continue to liaise with Far North Coast Weeds and 	Medium

Section	Action	Priority
	<p>Clarence Valley Weed Authority, the Grafton and Casino RLPBs and neighbours regarding coordinated pest control programs.</p> <ul style="list-style-type: none"> <li data-bbox="432 331 1321 495">• 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 (refer to <i>6.3 Research and Monitoring</i>). <li data-bbox="432 521 1321 591">• NPWS may approve the use of horses to muster and remove stock on a case by case basis if necessary. <li data-bbox="432 618 1321 748">• Provide information to the community regarding the impacts of introduced species and encourage off-park control programs to assist conservation of native animal populations. 	<p>High</p> <p>Medium</p> <p>Low</p>

5. Conservation of Cultural Heritage

Section	Action	Priority
5.1 Aboriginal Cultural Heritage	<ul style="list-style-type: none"> • Manage the Aboriginal cultural values of the planning area with the involvement of the local Aboriginal community, including relevant Local Aboriginal Land Councils (LALC), Native Title claimants and holders, Elders Councils and other Aboriginal representatives. 	High
	<ul style="list-style-type: none"> • Encourage local Aboriginal people to take part in park management by meeting with Local Aboriginal Land Councils and Elders groups when developing management plans such as plans of management and fire management strategies. 	High
	<ul style="list-style-type: none"> • Investigate opportunities for the employment of local Aboriginal people in park management. 	Medium
	<ul style="list-style-type: none"> • Record and protect Aboriginal sites, places of significance and other values associated with the planning area in consultation with the Aboriginal community. 	High
	<ul style="list-style-type: none"> • Inspect the art shelter in Mount Neville Nature Reserve every three years for signs of disturbance in conjunction with the Bogal LALC and undertake protective works as necessary. 	High
	<ul style="list-style-type: none"> • Encourage further research and surveys into the identification of Aboriginal sites, places and other values with the involvement of the Aboriginal community (refer to <i>6.3 Research and Monitoring</i>). 	Medium
5.2 Historic Heritage	<ul style="list-style-type: none"> • Encourage research into early-European use and historic sites in the planning area. 	Low
	<ul style="list-style-type: none"> • Record, assess existing items of early European occupation such as: <ul style="list-style-type: none"> - the cattle tick quarantine fence lines and associated infrastructure in Banyabba and Mount Neville Nature Reserves and Mount Pikapene National Park; - the site of the former homestead on Cabbage Tree Creek in Mount Neville Nature Reserve. 	Medium
	<ul style="list-style-type: none"> • Protect historic sites identified as having significant cultural or historic value. 	High
	<ul style="list-style-type: none"> • Structures and disturbances assessed as having little cultural or historic value e.g. cattle dip sites and clearings, will be recorded, and where necessary removed and the site rehabilitated (refer <i>6.4 Management Operations</i>). 	High

6. Use of the Planning Area

Section	Action	Priority
6.1 Visitor Use	<ul style="list-style-type: none"> Formal visitor facilities or camping areas will not be developed within the planning area. 	Medium
	<ul style="list-style-type: none"> If visitor use impacts to natural or cultural values and other users are unsustainable, causal activities will be restricted or prohibited. 	High
	Public Vehicle Access	
	<ul style="list-style-type: none"> Public vehicle access will be permitted on designated Park Roads in the planning area as listed in Table 3 and shown in Figures 1 and 2. 	Medium
	<ul style="list-style-type: none"> Park Roads will generally be maintained to dry-weather two-wheel drive standard. Access may be restricted during periods of wet weather. 	High
	<ul style="list-style-type: none"> Install signage, gates and bollards as necessary to restrict public vehicle access to the management trail system and the Banyabba Wilderness (refer to 6.4 <i>Management Operations</i>). 	High
	<ul style="list-style-type: none"> Create a vehicle turn-around at the intersection of the Dilkoon Road and Centre Trail as public vehicle access is not permitted in the Banyabba Wilderness (see Figure 1). 	Medium
	Bush walking	
	<ul style="list-style-type: none"> Bushwalking will be permitted throughout the planning area. 	Low
	Cycling	
	<ul style="list-style-type: none"> Cycling will be permitted on park roads and management trails within the planning area outside of the Banyabba Wilderness and subject to group size limits. 	Low
	Camping	
	<ul style="list-style-type: none"> Promote a minimal impact camping and a 'no trace' camping ethic. 	High
<ul style="list-style-type: none"> Permit pack or bush camping within the planning area. Camping will not be permitted within 200 metres of watercourses, in erosion prone areas and in vegetation rehabilitation areas. 	Medium	
Horse riding		
<ul style="list-style-type: none"> Exclude horse riding within the planning area. 	High	

Section	Action	Priority
	<p>Commercial or group activities</p> <ul style="list-style-type: none"> Assess commercial and group activity applications with respect to impacts to natural and cultural values. Activities deemed to have a significant or unsustainable impact will not be permitted. Visitor group size limits apply within the planning area unless the prior written consent of the North Coast Regional Manager is obtained. Group sizes are limited to 10 persons within the Banyabba Wilderness, and to 20 persons within the planning area outside of the Banyabba Wilderness. 	<p>High</p> <p>Medium</p>
<p>6.2 Information and Education</p>	<ul style="list-style-type: none"> Provide visitor information detailing the significant natural and cultural values of the planning area on the NPWS website and through other media, as opportunities arise and resources allow. Provide information explaining the principles behind NPWS management programs to neighbours and stakeholders. Advise local tourism information outlets, local government authorities, recreation groups, SFNSW and other relevant recreation providers of visitor opportunities available in the planning area (refer to 6.1 <i>Visitor Use</i>). Provide information on Fortis Creek National Park and Banyabba Nature Reserve at the intersection of the Dilkoon Road and the Summerland Way (see Figure 1). Erect interpretive signage at the boundary of the Banyabba Wilderness on Banyabba Trail, Saltwater Trail, Dilkoon Road, 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 wilderness area. Investigate opportunities to conduct interpretive or educational activities, such as the NPWS Discovery program, in the planning area. Any activities proposed for the Banyabba Wilderness area must be compatible with wilderness management principles (refer to 2.1 <i>Legislation & Policy Framework</i>, 2.3 <i>Wilderness</i>). Consult with, and inform, park neighbours of forthcoming management programs, such as fire and pest management activities. Review and update other sources of visitor information regarding the planning area, as necessary. 	<p>Medium</p> <p>Medium</p> <p>Medium</p> <p>Medium</p> <p>High</p> <p>Low</p> <p>High</p> <p>Low</p>
<p>6.3 Research and Monitoring</p>	<ul style="list-style-type: none"> Undertake and encourage appropriate research in the planning area that will assist to define and conduct best management practice, in accordance with the priorities identified above. 	<p>Medium</p>

Section	Action	Priority
	<ul style="list-style-type: none"> Record research data and findings in appropriate NPWS databases and libraries. 	Medium
6.4 Management Operations	<p>Roads, trails and additions to the planning area</p> <ul style="list-style-type: none"> Maintain a strategic network of management trails (see Figures 1 and 2) to a dry weather four-wheel drive standard. Trails will be signposted to provide direction and gates or bollards installed, where necessary to prevent unauthorised vehicle access. All other trails will be closed and rehabilitated. Close tracks no longer required for management purposes and allow them to regenerate naturally. If supplementary erosion control works become necessary, these will be undertaken as required. Negotiate a Memorandum of Understanding with SFNSW and other relevant stakeholders regarding the cooperative maintenance and use of Ministerial Roads. Pursue gazettal of Morgans Camp Trail as part of Fortis Creek National Park. Recommend Corymbia Fire Trail not be gazetted as part of Corymbia State Conservation Area. Review the requirement for road reserves within the Gurrang State Conservation Area and negotiate to gazette surplus road reserves as part of the state conservation area. Where Crown road access to NPWS estate does not exist, the NPWS will negotiate access arrangements with relevant neighbours to enable the NPWS to access the planning area for management purposes. Assess the feasibility of upgrading or providing an alternative alignment of the Banyabba Link Trail and implement the recommendations arising from this assessment. <p>Internal infrastructure</p> <ul style="list-style-type: none"> Remove the house and associated structures and control potentially invasive garden plantings at Morgan's Camp, within Fortis Creek National Park (refer to 4.5 <i>Introduced Plants and Animals</i>). Monitor the regeneration of this area, and undertake appropriate regeneration of native species if required. Maintain the large dam at Morgan's Camp within Fortis Creek National Park for fire management purposes. Allow and /or encourage natural regeneration of the smaller dam. Close and rehabilitate quarries following the removal of remaining stockpiles of material for road maintenance. 	<p>High</p> <p>Medium</p> <p>Medium</p> <p>Medium</p> <p>Medium</p> <p>Low</p> <p>Medium</p> <p>High</p> <p>Medium</p> <p>High</p> <p>Low</p>

Section	Action	Priority
	<ul style="list-style-type: none"> • Progressively rehabilitate disused quarry sites using local soils and plants from local genetic stock (refer to <i>4.2 Native Plants</i>). Priority will be given to the rehabilitation of the larger quarry sites within Fortis Creek National Park (refer to <i>6.4 Management Operations</i>). • Allow disturbed areas, such as areas cleared for grazing and redundant trails, to regenerate naturally. Supplement natural regeneration with weed control, site preparation and rehabilitation works where necessary. Seed for regeneration works will be collected locally (refer to <i>4.2 Native Plants</i>). <p>Non-NPWS uses</p> <ul style="list-style-type: none"> • Continue to license and manage all existing apiary sites within the planning area in accordance with NPWS policy. Any existing apiary sites that significantly compromise the environmental or recreational values of an area will be relocated in consultation with licensees. • Develop agreements with apiarists for management and maintenance of apiary sites. Where possible, apiary site access tracks are to be maintained by slashing to minimise soil disturbance. • Review the status of existing non-NPWS related uses. Undertake negotiations to grant licences, leases or easements for legally existing developments under the provisions of the NPW Act and seek proper commercial returns for these uses where appropriate. Monitor these uses annually to ensure any associated impacts are appropriately managed. 	<p>Low</p> <p>High</p> <p>High</p> <p>High</p> <p>Medium</p>

8. BIBLIOGRAPHY

- Blackmore and Associates. 1993. *Grafton Management Area EIS Supplementary Report. European heritage: Historical Report*. Prepared for Margules, Groome, Poyry Pty. Ltd. for State Forests of NSW.
- Bradstock, R.A., Keith, D.A. & Auld, T.D. 1995. "Fire and conservation: imperatives and constraints on managing diversity" in Bradstock, R.A. *et al. Conserving Biodiversity: threats and solutions*. Surrey Beatty and Sons, Sydney.
- Briggs, J.D. and Leigh, J.H. 1995. *Rare or threatened Australian plants*. Prepared by CSIRO Centre for Plant Biodiversity Research. Australian National Parks and Wildlife Service, Canberra.
- Bushfire and Environmental Services. 1998a. *Fortis Creek National Park and Banyabba Nature Reserve Draft Fire Management Plan*. Prepared for the NSW National Parks and Wildlife Service.
- Bushfire and Environmental Services. 1998b. *Mt Neville Nature Reserve Draft Fire Management Plan*. Prepared for the NSW National Parks and Wildlife Service.
- Bushfire and Environmental Services. 2000. *Preliminary Draft Fire Management Plan, RFA extension areas to Banyabba and Mount Neville Nature Reserves*. NSW National Parks and Wildlife Service.
- Byrne, D. 1987. "The Aboriginal and Archaeological Significance of the New South Wales Rainforests". Forestry Commission of New South Wales. 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, G.P. 1998. *Fauna Survey of Mt Neville Nature Reserve*. Report commissioned by the NPWS, Grafton District.
- Coles, G.S. 1980. *Vegetation ecology of the Clarence-Moreton Basin with special reference to Kangaroo Creek Sandstone*. Unpub BSc. (Hon.) thesis, University of New England, Armidale.
- Floyd, A. 1990. *Australian Rainforest in New South Wales*. Surrey Beatty and Sons, NSW.
- Hall, R. and 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.
- Heron, R. 1991. *Aboriginal perspectives: an ethnohistory of six Aboriginal communities in the Clarence Valley*. Unpub thesis submitted in partial fulfilment of the requirements of a Bachelor of Letters degree in Prehistory, Australian National University, Canberra.
- Hill, K.D. 1997. New taxa Eucalyptus (Myrtaceae) from New South Wales and Queensland. *Telopea*, 7(3): 187-198.
- Margules Groome Pöyry Pty Ltd. 1994. *Environmental Impact Statement: Proposed forestry operations, Grafton Management Area. Volume A - Main report*. State Forests of NSW.
- Margules, R. 1992. *Grafton Management Area forest histories*. Unpub manuscript.

- McBride, I. 1974. *Aboriginal prehistory in New England*. Sydney University Press, Sydney.
- McElroy, C.T. 1962. The geology of the Clarence-Moreton Basin. *Mem. Geol. Surv. NSW Geology*. 9.
- McElroy, C.T. 1969. The Clarence-Moreton Basin in New South Wales. *J. Geol. Soc. Aust.* 16: 457-479.
- McGregor, G. 1999. *Visitor Management Strategy for the Parks and Reserves of the Northern Region of NSW*. NSW National Parks and Wildlife Service.
- Moore, D.M. and Floyd, A.G. 1994. *A description of the flora and an assessment of impacts of the proposed forestry operations in the Grafton Forest Management Area*. Grafton Management Area EIS Supporting Document No. 2. State Forests of NSW.
- Natural Resources Audit Council. 1994. *Vegetation study of Banyabba Nature Reserve*. Natural Resources Audit Council, Sydney.
- NSW National Parks and Wildlife Service. 2003. *Atlas of NSW Wildlife*. Database.
- NSW National Parks and Wildlife Service 2003a. *Fire Interval Guidelines for Broad Vegetation Types*. NSW NPWS, Hurstville.
- NSW National Parks and Wildlife Service. 2002. *Draft North Coast Pest Management Strategy*. NSW NPWS, Hurstville, NSW
- NSW National Parks and Wildlife Service. 2002a. *Draft Southern Richmond Range Pest Management Plan (in preparation)*. NSW NPWS, Grafton, NSW
- NSW National Parks and Wildlife Service. 2002b. *Threatened Species of the Upper North Coast of New South Wales – Flora*. NSW NPWS, Coffs Harbour, NSW.
- NSW National Parks and Wildlife Service. 2001. *Northern Wilderness Assessment Report*. NSW NPWS, Hurstville.
- NSW National Parks and Wildlife Service. 2001a. *Key Habitats and Corridors for fauna as a framework for Regional biodiversity conservation planning in North-East NSW*. NSW National Parks and Wildlife Service, Coffs Harbour.
- NSW National Parks and Wildlife Service. 1999. *Eleocharis tetraquetra* Nees *Recovery Plan*. NSW NPWS, Hurstville, NSW.
- NSW National Parks and Wildlife Service 1999a. Unpublished report. *Vacant Crown Lands Project Stage II*. Natural Heritage Unit, NPWS, Northern Zone.
- NSW National Parks and Wildlife Service. 1999b. *Modelling areas of Habitat Significance for Vertebrate Fauna and Vascular Flora in North-east NSW*. A project undertaken 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.
- NSW National Parks and Wildlife Service. 1998a. *Draft Fire Management Plan (Preliminary Draft), Fortis Creek NP Creek National Park and Banyabba Nature Reserve*. NSW NPWS Grafton District.

- NSW National Parks and Wildlife Service. 1998b. *Rock Art Conservation – Northern Region*. Draft Report to Northern Zone on Field Work undertaken in March 1998 by David Lambert, NPWS Cultural Heritage Services Division.
- NSW National Parks and Wildlife Service. 1997. *Pest Management Strategy*. NSW NPWS, Grafton District.
- NSW National Parks and Wildlife Service. 1995. *Vegetation survey and mapping of Upper North East New South Wales*. A report by the NSW NPWS for the Natural Resources Audit Council, Sydney.
- NSW National Parks and Wildlife Service. 1984. *Proposed Mt Neville Nature Reserve: natural resources and conservation values*. NSW NPWS Natural Areas Investigation Section, Sydney.
- Olde, P. and Marriott, N. 1995. *The Grevillea Book, Volume 2*. Kangaroo Press Pty Ltd, Australia.
- Resource and Conservation Assessment Council. 1999. *Upper North East Region Forest Agreement*. NSW Government, Sydney.
- Resource and Conservation Assessment Council. 1996a. *Regional report of upper north east New South Wales, Volume 2: Physical attributes*. A report initiated by the NRAC. RACAC, Sydney.
- Resource and Conservation Assessment Council. 1996b. *Regional report of upper north east New South Wales, Volume 5: Socio-economic attributes*. RACAC, Sydney.
- Sheringham, P. and Westaway, J. 1995. *Significant vascular plants of upper North East New South Wales*. A report by the NSW National Parks and Wildlife Service for the Natural Resources Audit Council, Sydney.
- State Forests of NSW. 1995. *Environmental Impact Statement: Proposed forestry operations in Casino Management Area. Volume A: Main report*. State Forests of NSW, Pennant Hills, NSW.
- Tindale, N.B. 1974. *Aboriginal tribes of Australia*. University of California Press, California, USA.

9. APPENDICES

APPENDIX 1: VEGETATION COMMUNITIES OF THE PLANNING AREA

Key to flora lists:

Codes in parenthesis are assigned as follows:

TSC Act: V = Vulnerable; E = Endangered; **EPBC Act:** v = Vulnerable

Briggs and Leigh (1995) ROTAP classifications:

1 = Known by one collection only

2 = Geographic range in Australia less than 100 km

3 = Geographic range in Australia greater than 100 km

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

V = Vulnerable, at risk of disappearing from the wild within 20-50 years through continued depletion or as a result of land use changes

R = Rare, species considered rare in Australia but does not currently have any identifiable threat

K = Poorly known, species suspected but not definitely known to belong to one of the above categories

C = Reserved, at least one population known to occur within a conservation reserve

a = 1000 plants or more are known to occur within a conservation reserve(s)

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

- = reserved population size is not accurately known

Sheringham and Westaway (1995):

3 = rare in NSW, 4 = regionally uncommon, 5 = depleted or sparse,

6 = regionally endemic, 7 = disjunct population,

8 = geographical limit (S = south, N = north).

Table 6: Vegetation communities of Fortis Creek National Park

Vegetation community	Dominant species/association	Species of conservation significance occurring in each community
Dry open forest	<i>Corymbia henryi</i> , <i>E. siderophloia</i>	<i>Acacia ruppia</i> (E, v, 2E), <i>Eucalyptus tetrapleura</i> (V, 2VCa), <i>Boronia chartacea</i> (3R, 8N), <i>Angophora robur</i> (V, v, 2RC-), <i>Eleocharis tetraquetra</i> (E), <i>E. psammitica</i> (3K)
Dry open forest (on heavy clay soils)	<i>E. tereticornis</i> , <i>C. maculata</i>	<i>Grevillea masonii</i> (E, 2E)
Dry open forest	<i>E. siderophloia</i> , <i>Corymbia gummifera</i> , <i>Corymbia intermedia</i>	<i>Leucopogon recurvisepalus</i> (3RC), <i>Dodonaea hirsuta</i> (E, 3RC-)
Swamp forest	<i>Melaleuca sieberi</i>	
Swamp forest	<i>Angophora robur</i> , <i>Banksia serrata</i>	<i>Angophora robur</i> (V, v, 2RC-), <i>Prostanthera spinosa</i> (3 7 8N), <i>Angophora paludosa</i> (restricted to Coaldale sandstones), <i>Acacia granitica</i> (7 8S)

Source: Moore and Floyd 1994; SFNSW 1995.

Table 7: Vegetation communities of Banyabba Nature Reserve

Vegetation community	Dominant species/association	Species of conservation significance occurring in each community
Tall open forest (moist)		
Red Gum, Angophora, Swamp Box (alluvial terraces, major riparian zones)	<i>Eucalyptus tereticornis</i> - <i>Angophora paludosa</i> , <i>E. bancroftii</i> , <i>E. notabilis</i> , <i>Lophostemon suaveolens</i> ,	<i>Angophora robur</i> (V, v, 2RC-), <i>Angophora paludosa</i> (restricted to Coaldale sandstones), <i>Callistemon acuminatus</i> (3RC-)
Tallowwood, Red/White Mahogany, Stringybark (alluvial terraces and protected gullies)	<i>E. microcorys</i> , <i>C. intermedia</i> , <i>E. resinifera</i> , <i>E. acmenoides</i> , <i>Angophora paludosa</i> , <i>Lophostemon confertus</i>	<i>Acacia granitica</i> (7 8S), <i>Acacia hispidula</i> (7), <i>Lambertia formosa</i> (7 8N), <i>Eriostemon myoporoides</i> ssp. <i>conduplicatus</i> (4 7 8S)
Tall open forest		
Bancrofts Red/Orange Gum - Angophora (rock ridges and streams)	<i>Lophostemon suaveolens</i> - <i>Angophora paludosa</i> - <i>E. bancroftii</i>	<i>Boronia chartacea</i> (3R), <i>Grevillea banyabba</i> (V, 2VC-), <i>Angophora paludosa</i> (restricted to Coaldale sandstones)
Pink Bloodwood - Red/White Mahogany – Stringybark (rock ridges and streams, protected lower slopes)	<i>C. intermedia</i> , <i>E. resinifera</i> , <i>E. acmenoides</i> , <i>E. notabilis</i> , <i>E. baileyana</i>	<i>Callistemon acuminatus</i> (3RC), <i>Plectranthus suaveolens</i> (3KC-), <i>Prostanthea spinosa</i> (3 7 8N), <i>Leucopogon recurvisepalus</i> (3KC), <i>Olearia stilwelliae</i> (3RCa)
Stringybark, Red/White Mahogany, Turpentine (protected mid and lower slopes)	<i>E. baileyana</i> , <i>E. resinifera</i> , <i>E. notabilis</i> , <i>Syncarpia glomulifera</i>	<i>Hibbertia marginata</i> (V, 2E)
Open forest		
Stringybark, Red Bloodwood, Bastard Mahogany, Angophora (most dominant association - on rocky ridges and deep/shallow pale siliceous sands)	<i>E. planchoniana</i> , <i>E. psammitica</i> , <i>E. baileyana</i> , <i>C. gummifera</i> , <i>Angophora woodsiana</i>	<i>E. notabilis</i> (7 9), <i>Acacia ruppii</i> (E, v, 2E), <i>Grevillea banyabba</i> (V, 2VC), <i>E. psammitica</i> (3K)
Blackbutt, Stringybark, Mahogany, Bloodwood, Angophora (rocky scarps, ridges, deep/shallow sands)	<i>E. pilularis</i> , <i>E. baileyana</i> , <i>E. planchoniana</i> , <i>E. pyrocarpa</i> , <i>E. psammitica</i> , <i>C. gummifera</i>	<i>Acacia ruppii</i> (E, v, 2E), <i>Grevillea banyabba</i> (V, 2VC), <i>Eucalyptus psammitica</i> (3K)
Blackbutt and/or Large Fruited Blackbutt (upper/lower slopes under rocky scarps)	<i>E. pilularis</i> and/or <i>E. pyrocarpa</i>	
Large-leaved Spotted Gum, Ironbark, Stringybark (sedimentary ridges and islands)	<i>C. henryi</i> , <i>E. fibrosi</i> , <i>E. siderophloia</i> , <i>E. crebra</i> , <i>E. tindaliae</i> , <i>E. tereticornis</i> , <i>E. moluccana</i>	<i>Acacia ruppii</i> (E, v, 2E), <i>Melichrus hirsutus</i> (E, 2E)
Ironbark, Brown/Pink Bloodwood (isolated on some lower slopes)	<i>E. fibrosa</i> , <i>E. fusiformis</i> , <i>C. intermedia</i> , <i>E. trachyphloia</i>	<i>Tricoryne anceps</i> ssp. <i>pterocaulon</i> (3 8S), <i>Caladenia</i> ssp. C (4 7? 8N?), <i>Hibbertia marginata</i> (6), <i>E. fusiformis</i> (2RC-)
<i>Eucalyptus pachycalyx</i> ssp. <i>Banyabbensis</i> (very isolated - on ridge tops with skeletal soils - orange irregular pebbles)	<i>Eucalyptus pachycalyx</i> ssp. <i>Banyabbensis</i>	<i>Eucalyptus psammitica</i> (3K), <i>Eucalyptus pachycalyx</i> ssp. <i>banyabbensis</i> (E, 2VCi) (endemic subspecies (Hill))
Heath (near Lardners Lookout)		<i>Acacia granitica</i> (7 8S), <i>Pultenea myrtoides</i>

Source: NPWS 1984; NPWS 1995; NRAC 1994; SFNSW 1995.

Table 8: Vegetation communities of Mount Neville Nature Reserve

Vegetation community	Dominant species/association	Species of conservation significance occurring in each community
Closed forest (restricted to headwaters of Sportsmans Creek)	<i>Lophostemon confertus</i> , <i>Syncarpia glomulifera</i> (rainforest understorey)	<i>Grevillea quadricauda</i> (3VC-) - upper slopes and ridges
Palm and riparian closed forest (Cabbage Tree and Four Mile Creek)	<i>Livistonia australis</i> , <i>Archontophoenix Cunninghamiana</i>	<i>Hibbertia marginata</i> (V, 2 6)
Tall open moist forest	<i>Lophostemon confertus</i> , <i>Syncarpia glomulifera</i> , <i>E. intermedia</i>	<i>Phyllanthus microcladus</i> (3 8S)
Tall open forest with moist understorey (upper catchments of Four Mile and Cabbage Tree Creek)	<i>E. pilularis</i> , <i>C. gummifera</i> , <i>E. planchoniana</i>	
Open forest (widespread, sandstone slopes)	<i>E. pilularis</i> , <i>C. gummifera</i> , <i>E. planchoniana</i> , <i>Xanthorrhoea</i> sp. common	<i>Astrotricha cordata</i> (3 7 8S)
Tall open forest: Spotted Gum/Ironbark association (hillslopes and valley floors thinly bedded sandstones/siltstones)	<i>Corymbia maculata</i> , <i>E. fibrosa</i> , <i>E. siderophloia</i> (dry understorey)	<i>Leucopogon recurvisepalus</i> (3KC)
Tall open forest (alluvium valley flats)	<i>Eucalyptus tereticornis</i> – <i>Banksia integrifolia</i>	<i>E. rummeryi</i> (3RC-) (fire trail)
Tall closed shrubland (lower creeklines)	<i>Acacia irrorata</i> , <i>Banksia integrifolia</i>	
Open shrubland (cliff lines rocky outcrops)	<i>Ficus rubiginosa</i> , <i>Plectranthus parviflorus</i> , <i>Hibiscus splendens</i>	
Shrubland	<i>Callistemon</i> aff. <i>montanus</i> , <i>Leptospermum polyanthum</i>	<i>E. psammitica</i> (3K), <i>Rulingia</i> species (1), <i>Leptospermum polyanthum</i> (regional significance), <i>Keraudrenia</i> ssp. aff. <i>hillii</i> (regional significance), <i>Pterostylis daintreana</i> (4)
Heath forest	<i>Angophora woodsiana</i> , <i>E. pilularis</i> , <i>C. gummifera</i>	<i>Hibbertia acuminata</i> (6)
Grassy forest	<i>C. henryi</i> , <i>E. tindaliae</i> , <i>C. maculata</i>	<i>E. fusiformis</i> (2RC-), <i>Iphigenia indica</i> (3 7 8S), <i>Hibbertia marginata</i> (V, 2 6)
Grassy forest	<i>C. henryi</i> , <i>C. intermedia</i>	<i>Olearia stilwelliae</i> (3RCa), <i>Boronia chartacea</i> (3R)
Grassy forest	<i>E. tereticornis</i> , <i>Angophora subvelutina</i>	<i>Macrozamia fawcetti</i> (6)
Grassy forest	<i>E. siderophloia</i> , <i>C. maculata</i> , <i>E. moluccana</i>	<i>E. rummeryi</i> (3RC-), <i>Plectranthus nitidus</i> (2KCi), <i>Grevillea quadricauda</i> (3VC-), <i>Iphigenia indica</i> (3 7 8S)
Grassy forest	<i>E. propinqua</i> , <i>E. tereticornis</i> , <i>C. maculata</i>	<i>Plectranthus suaveolens</i> (3KC-), <i>Abildgaardia vaginata</i> (4 8S), <i>Mirbelia speciosa</i> subsp. <i>ringrosei</i> (4 8S) - sandstone ridges and slopes
Swamp woodland	<i>Melaleuca quinquenervia</i>	

Source: NPWS 1984; SFNSW 1995; NRAC 1994.

Table 9: Vegetation communities of Mount Pikapene National Park

Vegetation community	Dominant species/association	Species of conservation significance occurring in each community
Dry rainforest (western/southwestern slopes)	<i>Drypetes australasica</i> - <i>Aracauria</i> alliance <i>Flindersia</i> spp. - <i>Aracauria cunninghamii</i> sub-alliance	
Dry rainforest	<i>E. rummeryi</i> with dry rainforest understorey	<i>E. rummeryi</i> (3RC-), <i>Hoya oligotrica</i> (5 7), <i>Astrotricha cordata</i> (3 7 8S), <i>Chiloglottis diphylla</i> (4 8N), <i>Iphigenia indica</i> (3 7 8S).
Tall moist forest	<i>C. maculata</i> , <i>E. propinqua</i>	
Tall moist forest	<i>Lophostemon confertus</i> , <i>Syncarpia glomulifera</i> , <i>C. intermedia</i>	

Source: SFNSW 1995.

Table 10: Vegetation communities of Chapman's Peak Nature Reserve

Vegetation community	Dominant species/association	Species of conservation significance occurring in each community
Dry open forest	<i>Eucalyptus pilularis</i> and <i>E. planchoniana</i>	

Source: Moore and Floyd 1994.

Table 11: Vegetation communities of Wombat Creek State Conservation Area

Vegetation community	Dominant species/association	Species of conservation significance occurring in each community
Dry Heathy Sandstone Blackbutt	<i>E. pilularis</i> , <i>Syncarpia glomulifera</i> , <i>Persoonia stradbrokeiensis</i> , <i>Trochocarpa laurina</i>	
Granite Mallee (low forest)	<i>E. codonocarpa</i> , <i>Persoonia rufa</i> , <i>Boronia anethifolia</i> , <i>Leptospermum nova-anglica</i> , <i>Allocasuarina rigida</i>	<i>E. codonocarpa</i> (3RC-), <i>Kunzea bracteolata</i> (3RC-)
Northern Open Grassy Blackbutt	<i>E. pilularis</i> , <i>Syncarpia glomulifera</i> , <i>Persoonia stradbrokeiensis</i> , <i>Leucopogon lanceolatus</i>	
Baileys Stringybark (low open forest)	<i>E. baileyana</i> , <i>E. planchoniana</i> , <i>Xanthorrhoea latifolia</i> , <i>Entolasia stricta</i> , <i>Persoonia tenuifolia</i>	
Dry Healthy Blackbutt – Bloodwood (medium tall forest)	<i>E. pilularis</i> , <i>Syncarpia glomulifera</i> , <i>Corymbia intermedia</i> , <i>Pimelia linifolia</i> , <i>Entolasia stricta</i>	
Dry Grassy Stringybark	<i>E. campanulata</i> , <i>E. caliginosa</i> , <i>E. microcorys</i> , <i>E. cameronii</i> , <i>E. biturbinata</i>	

Clarence Lowland Needlebark Stringybark (very dry forest)	<i>E. planchoniana</i> , <i>Syncarpia glomulifera</i> , <i>Leptospermum polygalifolium</i> , <i>Banksia oblongifolia</i> ,	
---	--	--

Source: SFNSW 1995.

Table 12: Vegetation communities of Banyabba State Conservation Area

Vegetation community	Dominant species/association	Species of conservation significance occurring in each community
Clarence Lowlands Spotted Gum (tall dry forest)	<i>E. siderophloia</i> , <i>Corymbia henryi</i> , <i>E. propinqua</i> , <i>Allocasuarina torulosa</i>	<i>E. tetrapleura</i> (V,v,3RC-)
Lowland Redgum	<i>Lophostemon suaveolens</i> , <i>Alphitonia excelsa</i> , <i>E. teretecornis</i>	
Foothills Grey Gum-Ironbark_Spotted Gum	<i>E. propinqua</i> , <i>E. siderophloia</i> , <i>Allocasuarina torulosa</i> , <i>Breynia oblongifolia</i>	
Sandstone Spotted Gum-Blackbutt (medium tall forest)	<i>E. pilularis</i> , <i>Corymbia henryi</i> , <i>Persoonia stradbrokeensis</i> , <i>Allocasuarina torulosa</i> , <i>Acacia concurrens</i> , <i>Jacksonia scoparia</i>	
Dry Healthy Blackbutt – Bloodwood (medium tall forest)	<i>E. pilularis</i> , <i>Syncarpia glomulifera</i> , <i>Corymbia intermedia</i> , <i>Pimelia linifolia</i> , <i>Entolasia stricta</i>	<i>Boronia chartacea</i> (3R), <i>Eucalyptus psammitica</i> (3K - Endemic)
Baileys Stringybark (low open forest)	<i>E. baileyana</i> , <i>E. planchoniana</i> , <i>Xanthorrhoea latifolia</i> , <i>Entolasia stricta</i> , <i>Persoonia tenuifolia</i>	
Coast Range Bloodwood-Mahogany	<i>Corymbia intermedia</i> , <i>Angophora woodsiana</i> , <i>Pimelia linifolia</i> , <i>Persoonia stradbrokeensis</i> , <i>Allocasuarina torulosa</i>	

Source: SFNSW 1995.

Table 13: Vegetation communities of Corymbia State Conservation Area

Vegetation community	Dominant species/association	Species of conservation significance occurring in each community
Dry Heathy Sandstone Blackbutt	<i>E. pilularis</i> , <i>Syncarpia glomulifera</i> , <i>Persoonia stradbrokeensis</i> , <i>Trochocarpa laurina</i>	
Lowland Redgum	<i>Lophostemon suaveolens</i> , <i>Alphitonia excelsa</i> , <i>E. teretecornis</i>	
Dry Healthy Blackbutt – Bloodwood (medium tall forest)	<i>E. pilularis</i> , <i>Syncarpia glomulifera</i> , <i>Corymbia intermedia</i> , <i>Pimelia linifolia</i> , <i>Entolasia stricta</i>	

Sandstone Spotted Gum-Blackbutt (medium tall forest)	<i>E. pilularis</i> , <i>Corymbia henryi</i> , <i>Persoonia stradbokensis</i> , <i>Allocasuarina torulosa</i> , <i>Acacia concurrens</i> , <i>Jacksonia scoparia</i>	
Clarence Lowlands Spotted Gum (tall dry forest)	<i>E. siderophloia</i> , <i>Corymbia henryi</i> , <i>E. propinqua</i> , <i>Allocasuarina torulosa</i>	
Northern Open Grassy Blackbutt	<i>E. pilularis</i> , <i>Syncarpia glomulifera</i> , <i>Persoonia stradbokensis</i> , <i>Leucopogon lanceolatus</i>	
Lowland Spotted Gum – Box (tall forest)	<i>Corymbia henryi</i> , <i>E. moluccana</i> , <i>E. siderophloia</i> , <i>Alphitonia excelsa</i> , <i>Acacia concurrens</i>	

Source: SFNSW 1995.

Table 14: Vegetation communities of Gurrang State Conservation Area

Vegetation community	Dominant species/association	Species of conservation significance occurring in each community
Northern Open Grassy Blackbutt	<i>E. pilularis</i> , <i>Syncarpia glomulifera</i> , <i>Persoonia stradbokensis</i> , <i>Leucopogon lanceolatus</i>	
Lowland Redgum	<i>Lophostemon suaveolens</i> , <i>Alphitonia excelsa</i> , <i>E. teretecornis</i>	
Heathy Scribbly Gum (medium forest)	<i>E. signata</i> , <i>Corymbia gummifera</i> , <i>Pimelia linarifolia</i> , <i>Persoonia stradbokensis</i> , <i>Gompholobium pinnatum</i>	
Foothills Grey Gum - Ironbark - Spotted Gum	<i>E. propinqua</i> , <i>E. siderophloia</i> , <i>Allocasuarina torulosa</i> , <i>Breynia oblongifolia</i>	
Clarence Lowlands Spotted Gum (tall dry forest)	<i>E. siderophloia</i> , <i>Corymbia henryi</i> , <i>E. propinqua</i> , <i>Allocasuarina torulosa</i>	
Lowland Spotted Gum – Box (tall forest)	<i>Corymbia henryi</i> , <i>E. moluccana</i> , <i>E. siderophloia</i> , <i>Alphitonia excelsa</i> , <i>Acacia concurrens</i>	

Source: SFNSW 1995.

Table 15: Vegetation communities of Kooyong State Conservation Area

Vegetation community	Dominant species/association	Species of conservation significance occurring in each community
Dry Healthy Blackbutt – Bloodwood (medium tall forest)	<i>E. pilularis</i> , <i>Syncarpia glomulifera</i> , <i>Corymbia intermedia</i> , <i>Pimelia linifolia</i> , <i>Entolasia stricta</i>	
Baileys Stringybark (low open forest)	<i>E. baileyana</i> , <i>E. planchoniana</i> , <i>Xanthorrhoea latifolia</i> ,	

	<i>Entolasia stricta</i> , <i>Persoonia tenuifolia</i>	
Foothills Grey Gum - Ironbark - Spotted Gum	<i>E. propinqua</i> , <i>E. siderophloia</i> , <i>Allocasuarina torrulosa</i> , <i>Breynia oblongifolia</i>	
Lowland Redgum	<i>Lophostemon suaveolens</i> , <i>Alphitonia excelsa</i> , <i>E. teretecornis</i>	
Clarence Lowlands Spotted Gum (tall dry forest)	<i>E. siderophloia</i> , <i>Corymbia henreyi</i> , <i>E. propinqua</i> , <i>Allocasuarina torrulosa</i>	

Source: SFNSW 1995.

Table 16: Vegetation communities of Laurence Road State Conservation Area

Vegetation community	Dominant species/association	Species of conservation significance occurring in each community
Baileys Stringybark (low open forest)	<i>E. baileyana</i> , <i>E. planchoniana</i> , <i>Xanthorrhoea latifolia</i> , <i>Entolasia stricta</i> , <i>Persoonia tenuifolia</i>	
Dry Heathy Sandstone Blackbutt	<i>E. pilularis</i> , <i>Syncarpia glomulifera</i> , <i>Persoonia stradbrokeiensis</i> , <i>Trochocarpa laurina</i>	
Dry Healthy Blackbutt – Bloodwood (medium tall forest)	<i>E. pilularis</i> , <i>Syncarpia glomulifera</i> , <i>Corymbia intermedia</i> , <i>Pimelia linifolia</i> , <i>Entolasia stricta</i>	
Northern Open Grassy Blackbutt	<i>E. pilularis</i> , <i>Syncarpia glomulifera</i> , <i>Persoonia stradbrokeiensis</i> , <i>Leucopogon lanceolatus</i>	
Lowland Redgum	<i>Lophostemon suaveolens</i> , <i>Alphitonia excelsa</i> , <i>E. teretecornis</i>	
Coast Range Bloodwood-Mahogany	<i>Corymbia intermedia</i> , <i>Angophora woodsiana</i> , <i>Pimelia linifolia</i> , <i>Persoonia stradbrokeiensis</i> , <i>Allocasuarina torrulosa</i>	

Source: SFNSW 1995.

APPENDIX 2. THREATENED FLORA OF THE PLANNING AREA

Table 17: Flora species of the planning area listed under the TSC Act.

Species	Legal Status	Location
<i>Acacia ruppilii</i> *	Endangered	Banyabba NR; Fortis Ck NP, Mount Neville NP, Wombat Creek SCA
<i>Angophora robur</i> *	Vulnerable	Fortis Ck NP, Wombat Creek SCA
<i>Astrotricha cordata</i>	Endangered	Mount Neville NR
<i>Babingtonia silvestris</i>	Endangered	Mount Neville NR
<i>Cyperus aquatilis</i>	Endangered	Banyabba SCA
<i>Eleocharis tetraquetra</i>	Endangered	Fortis Ck NP, Banyabba NR
<i>Eucalyptus pachycalyx</i> ssp. Banyabba*	Endangered	Banyabba NR
<i>Eucalyptus tetrapleura</i>	Vulnerable	Mount Neville NR
<i>Grammitis stenophylla</i>	Endangered	Mount Neville NR, Wombat Creek SCA
<i>Grevillea banyabba</i> *	Vulnerable	Banyabba NR, Banyabba SCA, Fortis Ck NP, Wombat Creek SCA
<i>Grevillea masonii</i> *	Endangered	Fortis Ck NP
<i>Grevillea quadricauda</i> *	Vulnerable	Mount Neville NR
<i>Hibbertia marginata</i> *	Vulnerable	Mount Neville NR, Kooyong SCA, Banyabba NR
<i>Homoranthus prolixus</i> *	Vulnerable	Banyabba NR
<i>Lindsaea incisa</i>	Endangered	Fortis Creek NP
<i>Melichrus hirsutus</i> *	Endangered	Banyabba NR, Wombat Creek SCA

Source: Environment Australia 2001; NPWS 2001.

Note: *Denotes species also listed under the Commonwealth EPBC Act.

Table 18: Regionally Significant and Rare Plants of the planning area*

Species	Location
<i>Adiantum aethiopicum</i> ♣	Banyabba NR, Mount Neville NR
<i>Adiantum formosum</i> ♣	Mount Pikapene NP, Mount Neville NR
<i>Adiantum hispidulum</i> ♣	Banyabba NR, Mount Neville NR
<i>Archontophoenix cunninghamiana</i> ♣	Mount Neville NR
<i>Boronia chartacea</i> ♦	Banyabba NR, Mount Neville NR, Fortis Ck NP, Wombat Creek SCA, Banyabba SCA
<i>Boronia ledifolia</i> ♣	Banyabba NR, Mount Neville NR
<i>Boronia rosmarinifolia</i> ♣	Banyabba NR
<i>Callistemon acuminatus</i> ♦	Banyabba NR
<i>Caustis flexuosa</i> ♣	Banyabba NR
<i>Caustis pentandra</i> ♣	Banyabba NR, Fortis Ck NP
<i>Ceratopetalum gummiferum</i> ♣	Banyabba NR
<i>Cyathea australis</i> ♣	Mount Neville NR
<i>Dendrobium teretifolium</i> ♣	Mount Pikapene NP
<i>Dodonaea hirsuta</i> ♦	Banyabba NR, Fortis Creek NP
<i>Eucalyptus ancophila</i> ♦	Kooyong SCA

<i>Eucalyptus fusiformis</i> ◆	Mount Neville NR
<i>Eucalyptus psammitica</i> ◆	Banyabba NR, Fortis Creek NP, Mount Neville NR
<i>Eucalyptus rummeryi</i> ◆	Mount Pikapene NP
<i>Keraudrenia corollata</i> var. <i>denticulata</i> ◆	Fortis Creek NP
<i>Leucopogon recurvisepalus</i> ◆	Banyabba NR, Mount Neville NR
<i>Liparis reflexa</i> ♣	Mount Neville NR
<i>Livistonia australis</i> ♣	Mount Neville NR
<i>Lomatia silaifolia</i> ♣	Banyabba NR, Mount Neville NR, Fortis Ck NP
<i>Marsdenia liisae</i> ◆	Mount Pikapene NP
<i>Olearia stillwelliae</i> ◆	Banyabba NR, Mount Neville NR
<i>Paspalidium grandispiculatum</i> ◆	Kooyong NR, Mount Neville NR
<i>Westringia blakeana</i> ◆	Mount Neville NR
<i>Westringia sericea</i> ◆	Banyabba NR
<i>Xylomelum pyriforme</i> ♣	Banyabba NR

Source: NPWS 2003; NPWS 2001; Briggs and Leigh 1995.

* N.B. Does not include species listed under the TSC Act or the EPBC Act.

♣ Regionally Significant species

◆ ROTAP species

APPENDIX 3: THREATENED FAUNA OF THE PLANNING AREA

Key to Table 19:

- = has been recorded
- = likely to occur

VN = Listed as Vulnerable in NSW

EN = Listed as Endangered in NSW

EP N = Listed as an Endangered Population in NSW

VC = Listed nationally as Vulnerable

EC = Listed nationally as Endangered

FC NP = Fortis Creek National Park

B NR = Banyabba Nature Reserve

MN NR = Mount Neville Nature Reserve

MP NP = Mount Pikapene National Park

CP NR = Chapman's Peak Nature Reserve

B SCA = Banyabba State Conservation Area

C SCA = Corymbia State Conservation Area

WC SCA = Wombat Creek State Conservation Area

LR SCA = Laurence Road State Conservation Area

G SCA = Gurrang State Conservation Area

K SCA = Kooyong State Conservation Area

Table 19: Threatened fauna species of the planning area

Common name	Scientific name	Legal status	FC NP	B NR	MN NR	MP NP	CP NR	B SCA	C SCA	WC SCA	LR SCA	G SCA	K SCA
Albert's lyrebird	<i>Menura alberti</i>	V – N			○								
barking owl	<i>Ninox connivens</i>	V - N	○	●	○	○		○	○				
barred cuckoo-shrike	<i>Coracina lineata</i>	V – N				○							
black bittern	<i>Ixobrychus flavicollis</i>	V – N		○	○								
black flying fox	<i>Pteropus alecto</i>	V – N			○								
black-breasted button-quail	<i>Turnix melanogaster</i>	E – N			○	○							
black-chinned honeyeater	<i>Melithreptus gularis gularis</i>	V - N	●					●	○		○		
black-necked stork	<i>Ephippiorhynchus asiaticus</i>	E – N				○						●	
black-striped wallaby	<i>Macropus dorsalis</i>	E – N				●							
brown treecreeper	<i>Climacteris picumnus</i>	V-N	●	●				●			○		
brush-tailed phascogale	<i>Phascogale tapoatafa</i>	V-N	●	●	○	○				●	○	●	●
brush-tailed rock wallaby	<i>Petrogale penicillata</i>	E – N V - C		○	○					●			

Common name	Scientific name	Legal status	FC NP	B NR	MN NR	MP NP	CP NR	B SCA	C SCA	WC SCA	LR SCA	G SCA	K SCA
bush stone-curlew	<i>Burhinus grallarius</i>			0		0							
comb-crested jacana	<i>Irediparra gallinacea</i>	V-N	•										
common bentwing-bat	<i>Miniopterus schreibersii</i>	V-N	•	0	0	0		•	0		0		0
common blossom-bat	<i>Syconycteris australis</i>	V – N			0								
common planigale	<i>Planigale maculata</i>	V – N		•		0		•			0	0	
double-eyed fig-parrot	<i>Cyclopsitta diopthalma coxeni</i>	E – N				0							
eastern cave bat	<i>Vespadelus troughtoni</i>	V-N	0	•	0	0				•			
eastern chestnut mouse	<i>Pseudomys gracilicaudatus</i>			0						•	0		
eastern false pipistrelle	<i>Falsistrellus tasmaniensis</i>	V-N	•	•	0			•					
eastern freetail-bat	<i>Mormopterus norfolkensis</i>			0	0	0		•					
eastern long-eared bat	<i>Nyctophilus bifax</i>	V – N			0								
eastern tube-nosed bat	<i>Nyctimene robinsoni</i>	V – N			0	0							
emu	<i>Dromaius novaehollandiae</i>	EP – N											
giant barred frog	<i>Mixophyes iteratus</i>	V – N E - C			0	•							
glossy black-cockatoo	<i>Calyptorhynchus lathami</i>	V-N	•	•	•	0		•			0	•	0
golden-tipped bat	<i>Kerivoula papuensis</i>	V – N			0	0							
greater broad-nosed bat	<i>Scoteanax rueppellii</i>	V – N		•	0	0		•					
green-thighed frog	<i>Litoria brevipalmata</i>	V-N	0	•	0	0						0	•
grey-crowned babbler	<i>Pomatostomus temporalis temporalis</i>	V-N	•	•				•	0			0	0
grey-headed flying-fox	<i>Pteropus poliocephalus</i>	V-N; V - C	•	•	•	•		•					0
hoary wattled bat	<i>Chalinolobus nigrogriseus</i>	V-N	•	•	0	0		•					
hooded robin	<i>Melanodryas cucullata</i>	V-N	•										
koala	<i>Phascolarctos cinereus</i>	V-N	•	•	•	•		•		•	0		•
large-eared pied bat	<i>Chalinolobus dwyeri</i>	V – N			•	•							

Common name	Scientific name	Legal status	FC NP	B NR	MN NR	MP NP	CP NR	B SCA	C SCA	WC SCA	LR SCA	G SCA	K SCA
large-footed myotis	<i>Myotis adversus</i>	V-N	0	0	0	0	0	•	0	0	0		0
little bent-wing bat	<i>Miniopterus australis</i>	V-N	•	•	•	•		•					•
long-nosed potoroo	<i>Potorous tridactylus</i>	V – N V - C		•		0							
Loveridge's frog	<i>Philoria loveridgei</i>	V – N			0								
marbled frogmouth	<i>Podargus ocellatus</i>	V – N			0								
masked owl	<i>Tyto novaehollandiae</i>	V-N	•	•	0	•		•		•	0		
parma wallaby	<i>Macropus parma</i>	V – N		•	0	0							
pouched frog	<i>Assa darlingtoni</i>	V – N			0								
powerful owl	<i>Ninox strenua</i>	V-N	•	0	•	•	0			•	0	0	•
red goshawk	<i>Erythroriorchis radiatus</i>	E – N V - C	0	0									
red-legged pademelon	<i>Thylogale stigmatica</i>	V – N			0	•							
red-tailed black-cockatoo	<i>Calyptorhynchus banksii</i>	V – N			0	0	0						
regent honeyeater	<i>Xanthomyza phrygia</i>	E – N E - C	0	0	0	0		0					0
rose-crowned fruit-dove	<i>Ptilinopus regina</i>	V – N			0	•							
rufous bettong	<i>Aepyprymnus rufescens</i>	V-N	•	•	•	•				•	0	0	•
rufous scrub-bird	<i>Atrichornis rufescens</i>	V – N			0								
sooty owl	<i>Tyto tenebricosa</i>	V – N			0	0							
speckled warbler	<i>Pyrrholaemus saggitata</i>												0
spotted-tailed quoll	<i>Dasyurus maculatus</i>	V-N	•	•	•	0			0				
square-tailed kite	<i>Lophoictinia isura</i>	V-N	0	0	0	0		0	0				0
squirrel glider	<i>Petaurus australis</i>	V-N	0	•	•	•	0	•	0	•	0		0
Stephens' banded snake	<i>Hoplocephalus stephensii</i>	V-N	0	0	0	0		0					0
superb fruit-dove	<i>Ptilinopus superbus</i>			0	0	0							
swift parrot	<i>Lathamus discolor</i>	E – N E - C	0	0	0	0		0					0

Common name	Scientific name	Legal status	FC NP	B NR	MN NR	MP NP	CP NR	B SCA	C SCA	WC SCA	LR SCA	G SCA	K SCA
three-toed snake-toothed skink	<i>Coeranoscincus reticulatus</i>	V - N				0							
turquoise parrot	<i>Neophema pulchella</i>	V-N	•										
white-crowned snake	<i>Cacophis harriettae</i>	V-N	•	•				•					
white-eared monarch	<i>Monarcha leucotis</i>	V - N			0								
wompoo fruit-dove	<i>Ptilinopus magnificus</i>	V - N		0		•							
yellow-bellied glider	<i>Petaurus australis</i>	V-N	•	•	•	•		•				0	0
yellow-bellied sheath-tail-bat	<i>Saccolaimus flaviventris</i>	V-N	•	•		•		•					0

Source: NPWS 2003; NPWS 2002; NPWS 1999b; B. Sansom *pers. comm.* 1998; Clancy 1998; Cogger 1996; Strahan 1998; State Forest of NSW 1995.

APPENDIX 4: FIRE MANAGEMENT REQUIREMENTS FOR THREATENED FLORA OF THE PLANNING AREA

Historically, large areas of the planning area have been affected by frequent fire (Bushfire and Environmental Services, 1998a; 1998b). Inappropriate fire regimes are the main threat to species diversity in the planning area. In particular, too frequent fire is a threat to the fire sensitive species endemic or restricted to the Glenreagh-Coaldale sandstone belt (part of the Kangaroo Creek sandstone complex). Table 18 lists threatened and endemic flora of fire concern in this area.

Table 20: Threatened and endemic flora of fire concern in the Glenreagh-Coaldale sandstone belt of the planning area

Species	Legal status	Location	Comments
<i>Acacia ruppii</i>	E	Banyabba NR, Fortis Creek NP, Mount Neville NP, Wombat Creek SCA	Found in dry open forest and shrubland in sandstone areas, often near creeks and roadsides. Requires a minimum of 3-4 years without fire to reproduce successfully. Roadside populations may also be susceptible to disturbance.
<i>Angophora robur</i>	V	Fortis Creek NP, Wombat Creek SCA	Found in dry open forest on sandstone. Too-frequent fires suppresses successful regeneration.
<i>Astrotricha cordata</i>	E	Mount Neville NR	Found in dry sclerophyll communities on exposed rocky summits and ridges, cliff edges, and rocky slopes. Threatened by inappropriate fire regimes.
<i>Babingtonia silvestris</i>	E	Mount Neville NR	Found in shrubby woodland. Too-frequent fires suppress successful regeneration. Further investigation required.
<i>Cyperus aquitalis</i>	E	Banyabba SCA	Grows in ephemeral wet sites. Roadside populations may be susceptible to disturbance.
<i>Eleocharis tetraquetra</i>	E	Fortis Creek NP, Banyabba NR	Found in damp areas on the edges of streams and swamps. Fire identified as a threat in Recovery Plan for this species.
<i>Eucalyptus pachycalyx</i> ssp. <i>banyabba</i>	E	Banyabba NR	Found on shallow sandy soils over sandstone. Appears to regenerate from underground lignotubers. Little known about post disturbance response or reproductive biology. Roadside populations may also be susceptible to disturbance.
<i>Eucalyptus tetrapleura</i>	V	Mount Neville NR	Dry or moist eucalypt forest. Threats include lack of recruitment through inappropriate fire regimes and drought stress.
<i>Grammitis stenophylla</i>	E	Mount Neville NR, Wombat Creek SCA	Small fern preferring moist habitat, such as near streams, on rocks or in trees in rainforest and moist eucalypt forest.

Species	Legal status	Location	Comments
<i>Grevillea banyabba</i>	V	Banyabba NR & SCA, Fortis Creek NP, Wombat Creek SCA	Shrubby open eucalypt forest on low sandstone ridges and slopes. High frequency fire may reduce population size and vigour if plants are burned prior to reproductive maturity.
<i>Grevillea masonii</i>	E	Fortis Creek NP	Mainly in disturbed road verges and pasture at low altitudes, but natural habitat is open eucalypt woodland. Poorly understood post disturbance response & reproductive biology. Requires further investigation.
<i>Grevillea quadricauda</i>	V	Mount Neville NR	Found in dry eucalypt forest understorey, often near creeks. Fire requirements are unknown.
<i>Hibbertia marginata</i>	V	Mount Neville NR, Kooyong SCA, Banyabba NR	Found in grassy or shrubby dry open eucalypt forest at low altitudes on sandstone. Threatened by too-frequent fires, which suppresses reproduction.
<i>Homoranthus prolixus</i>	V	Banyabba NR	Grows in heath, in skeletal soils in rocky outcrops.
<i>Lindsaea incisa</i>		Fortis Creek NR	Ground fern found in dry eucalypt forest on sandstone and moist shrubby eucalypt forest on metasediments, usually in wetter areas. Threatened by too-frequent fire regimes.
<i>Melichrus hirsutus</i>	E	Banyabba NR, Wombat Creek SCA	Found in low altitude dry shrubby eucalypt forest on sandy soils, also on roadsides and sandstone quarries. Fire sensitive, does not appear to regenerate after fire. Roadside populations may also be susceptible to disturbance. Requires further investigation.

Source: Quinn *et al.* 1995; Olde and Marriott 1994; Sheringham and Westaway 1995; NPWS 1999; NPWS 2002b.

Fire is also a key threat to the fire sensitive rainforest in Mount Pikapene National Park. Species such as hoop pine (*Arcauria cunninghamii*) in dry rainforest may be eliminated by frequent fires (Floyd 1990) (refer to Section 4.1.4). The *Archontophoenix-Livistonia* palm forest on the south-western ridge below Mount Pikapene itself is also under threat from an inappropriate fire regime.

APPENDIX 5: FAUNA SPECIES ASSEMBLAGES FOR KEY HABITAT IN THE PLANNING AREA

Table 21: Fauna species assemblages for key habitat within the planning area

Common name	Scientific name
Moist Escarpment – Foothills assemblage	
glossy black-cockatoo	<i>Calyptorhynchus lathami</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>Nyctinomus australis</i>
little bentwing-bat	<i>Miniopterus australis</i>
common bentwing-bat	<i>Miniopterus schreibersii</i>
little vespadelus	<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>Erythrorhynchus 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>Chrysococcyx malayanus</i>
forest kingfisher	<i>Todiramphus macleayii</i>
hooded robin	<i>Melanodryas cuculatta</i>
grey-crowned babbler	<i>Pomatostomus 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 bat	<i>Chalinolobus nigrogriseus</i>
little broad-nosed bat	<i>Scotorepens greyii</i>
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>
Wet Escarpment – Foothills assemblage	
pouched frog	<i>Assa darlingtoni</i>
	<i>Mixophyes fleayi</i>
leaf-tailed gecko	<i>Saltuarius swaini</i>
southern angle-headed dragon	<i>Hypsilurus spinipes</i>
	<i>Ophioscincus truncatus</i>
	<i>Saproscincus challengeri</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>

Common name	Scientific name
Albert's lyrebird	<i>Menura alberti</i>
pale-yellow robin	<i>Tregallasio capito</i>
little shrike thrush	<i>Colluricincla megarhyncha</i>
white-eared monarch	<i>Monarcha leucotis</i>
barred cuckoo-shrike	<i>Coracina lineata</i>
dusky antechinus	<i>Antechinus swainsonii</i>
red-legged pademelon	<i>Thylogale stigmatica</i>
Queensland 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 little mastiff-bat	<i>Mormopterus norfolkensis</i>
large pied bat	<i>Chalinolobus dwyeri</i>
greater broad-nosed bat	<i>Scoteanax rueppellii</i>
Wet Eastern Tablelands assemblage	
stuttering frog	<i>Mixophyes balbus</i>
parma wallaby	<i>Macropus parma</i>
great pipistrelle	<i>Falsistrellus tasmaniensis</i>
Hastings River mouse	<i>Pseudomys oralis</i>
-	<i>Saproscincus rosei</i>

Source: NPWS 2001a.

Figure 1: Banyabba, Chapman's Peak and Mount Neville Nature Reserves, Fortis Creek National Park and Banyabba, Corymbia, Kooyong, Laurence Road, Gurrangang and Wombat Creek State Conservation Areas.

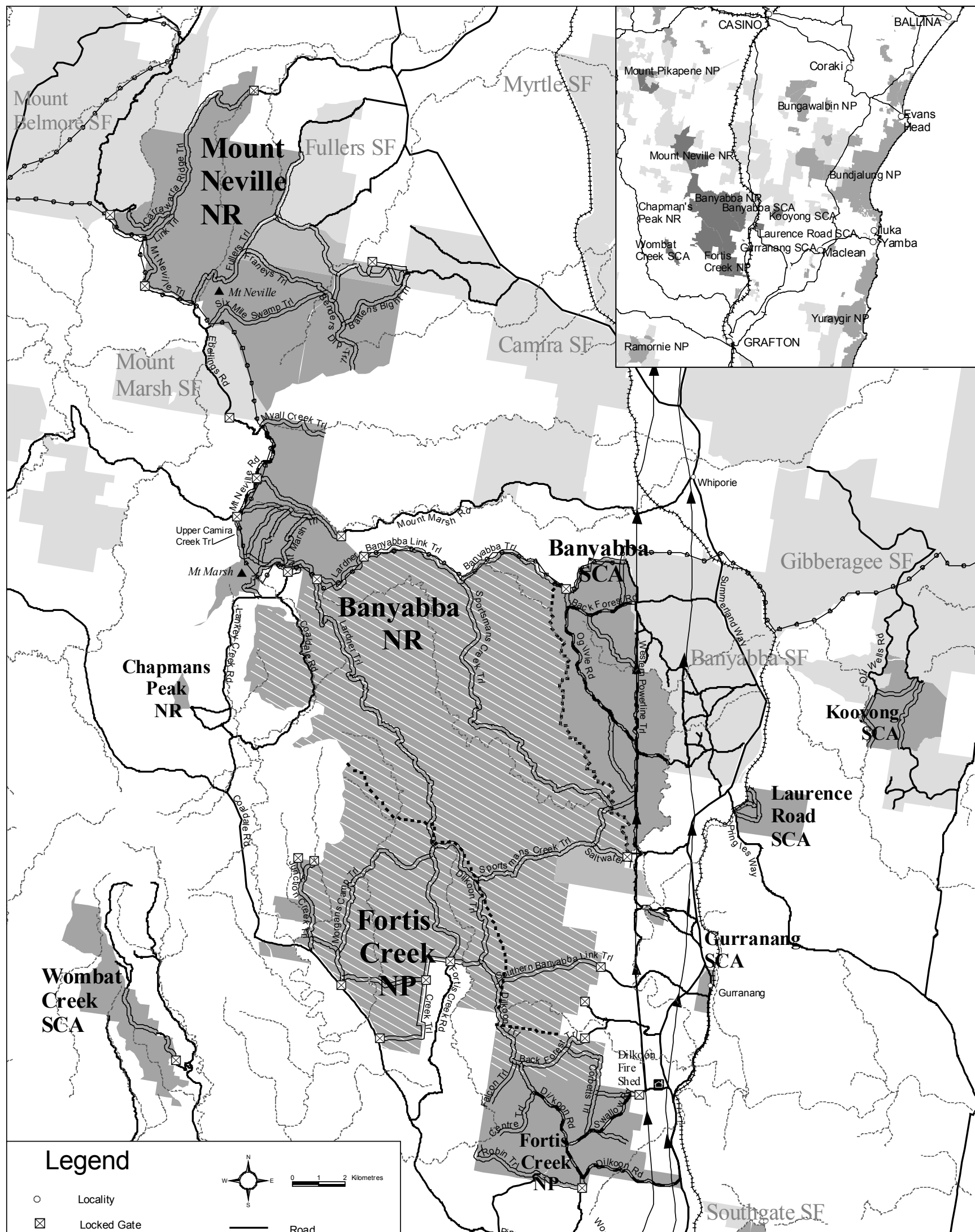


Figure 2: Mount Pikapene National Park

