

THE PARKS AND RESERVES OF THE NORTHERN RICHMOND RANGE

(including Richmond Range, Toonumbar
and Mallangane National Parks
and Hogarth Range Nature Reserve)

Plan of Management

This plan of management was adopted by the Minister for the Environment on 26 July 2005.

Acknowledgments

This plan of management was prepared by David Edwards with written contributions from Stephen King, David Charley and Lisa Wellman of the Northern Rivers Region of NPWS. Assistance was also provided by other NPWS officers, the NPWS Northern Rivers Regional Advisory Committee and members of the public.

Cover photograph of a fig tree on the Cambridge Plateau in Richmond Range National Park by Brad Cheers.

This plan was prepared with financial assistance from the World Heritage Management and Upkeep Program of the National Trust.

The planning process leading to the development of this plan has involved the collection and use of a large amount of information, which for reasons of document size, has not been included in the plan. For additional information or enquiries about the planning area or this plan, contact the Service's Kyogle Office on telephone (02) 6632 0000.

NSW National Parks and Wildlife Service

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FOREWORD

Toonumbar National Park, Richmond Range National Park, Mallanganee National Park and Hogarth Range Nature Reserve make up the parks and reserves of the northern Richmond Range. They are located in the north east of New South Wales, approximately 50 km west of Lismore. Kyogle and Casino to the east of the planning area are the nearest major centres.

The parks and reserves of the northern Richmond Range are significant as part of a system of conservation reserves in the north east of NSW. They are also significant because they incorporate five World Heritage listed areas that are part of the Central Eastern Rainforest Reserves of Australia, contain a diversity of vegetation communities, and contain a network of cultural sites of importance to local Bundjalung people.

These parks and reserves provide a range of 'low key' recreation opportunities, including the provision of roads for scenic driving, day use and camping areas, and horse riding opportunities.

The *National Parks and Wildlife Act 1974* requires that a plan of management be prepared for each nature reserve. A plan of management is a legal document that outlines how a reserve will be managed in the years ahead.

A draft plan of management for the Parks and Reserves of the Northern Richmond Range was placed on public exhibition from 1st February until 22nd April 2002. The exhibition of the plan of management attracted 114 submissions which raised 26 issues. All submissions received were carefully considered before adopting this plan of management.

The primary emphasis of this plan is the conservation of the natural, cultural and World Heritage values of the planning area. Visitor opportunities that are compatible with and promote the understanding and enjoyment of these values is also a key emphasis.

This plan of management establishes the scheme of operations for Toonumbar National Park, Richmond Range National Park, Mallanganee National Park and Hogarth Range Nature Reserve. In accordance with sections 75 and 76 of the *National Parks and Wildlife Act 1974*, this plan of management is hereby adopted.

BOB DEBUS

MINISTER FOR THE ENVIRONMENT

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ABBREVIATIONS

<i>NP&W Act</i>	National Parks & Wildlife Act 1974 (NSW)
NPWS	National Parks & Wildlife Service (NSW)
NP	National Park
NR	Nature Reserve
SFNSW	State Forests NSW

1. INTRODUCTION

1.1 LOCATION, GAZETTAL AND REGIONAL SETTING

The parks and reserves of the northern Richmond Range (referred to herein as “the planning area”) are located in the north east of New South Wales approximately 50 km west of Lismore. Kyogle and Casino to the east of the planning area are the nearest major centres. Other nearby settlements include Wiangaree, Woodenbong, Urbenville, Bonalbo and Mallanganee.

The planning area comprises Toonumbar, Richmond Range and Mallanganee National Parks and Hogarth Range Nature Reserve (refer to figure 1). These parks and reserves are generally situated on the northern part of the Richmond Range. The Richmond Range extends further south of Mallanganee National Park and includes other parks and reserves that will be covered in a separate planning document.

At the time of writing, it was proposed to change the protected area classification for Mallanganee NP from national park to nature reserve. This plan will apply to the planning area irrespective of any future name changes or re-classifications.

Prior to gazettal of the planning area as NPWS estate, the tenure of the planning area was state forest and vacant Crown land.

Table 1. The planning area: The parks and reserves of the northern Richmond Range.

PARK/ RESERVE	AREA	GAZETTAL YEAR
Toonumbar NP	14,991 ha	1995 & 1999
Richmond Range NP	15,420 ha	1997 & 1999
Mallanganee NP	1,144 ha	1999
Hogarth Range NR	853 ha	1999

The surrounding land use is predominantly state forest and large rural properties. The planning area falls within the local government areas of Kyogle and Richmond Valley.

The planning area is linked via state forest and private land to other nearby national parks (NP) such as Border Ranges NP to the north, Yabbra NP to the west, Mt Pikapene NP and the other parks and reserves of the southern Richmond Range to the south.

1.2 IMPORTANCE OF THE PLANNING AREA

The planning area is significant as part of a system of conservation reserves in the north east of NSW. It is also important in its own right due to its biodiversity, cultural, landscape and nature-based recreation values. The key values of planning area are summarised as follows.

Natural heritage values include:

- The planning area incorporates five World Heritage listed areas that are part of the Central Eastern Rainforest Reserves of Australia (CERRA). These areas comprise outstanding examples of ancient refuges of rainforest communities with a high diversity of plant and animal species.
- Is located within one of the most bio-diverse regions in Australia reflected by the diversity of vegetation communities which support a range of mammals, birds, reptiles, frogs and invertebrates.
- Contains a range of vegetation types including dry and subtropical rainforest, wet and dry sclerophyll forest and isolated heath communities. This includes large areas of old growth subtropical rainforest and wet sclerophyll forest.

Cultural heritage values include:

- The planning area is amongst a landscape that is part of the identity, spirituality, connection and resource base for the local Aboriginal people of the Bundjalung Nation.
- Contains a network of cultural sites such as creation places, ceremonial sites, traditional pathways and evidence of past occupation that is of great importance to local Bundjalung people and to their traditional laws, customs, beliefs and culture.
- Contains historic heritage associated with the early settlement of the region and use of the area for forestry.

Landscape values include:

- The landform of planning area is dominated by the Richmond Range which forms part of the forested mountain backdrop to surrounding areas and is of regional landscape significance.
- Contains significant geomorphological features such as the volcanic plugs of Dome Mountain, Glassy Mountain and Edinburgh Castle in Toonumbar NP which are remnants of the Focal Peak shield volcano.
- Contains large forested catchments which maintain water quality in the headwaters of the Richmond and Clarence Rivers.

Recreation values include:

- The planning area provides a range of 'low key' recreation opportunities, including the provision of day use and camping areas.
- Forest driving and horse riding opportunities are provided, particularly in Richmond Range NP.
- Education and interpretation opportunities associated with the World Heritage CERRA rainforests, Aboriginal heritage values and diverse plant and animal communities.

Research values include:

- Research opportunities associated with the diversity of native plants and animals and post-logging forest succession.

2. MANAGEMENT CONTEXT

2.1 LEGISLATION AND POLICY

The management of national parks and nature reserves in NSW is in the context of the legislative and policy framework, primarily the *National Park and Wildlife Act 1974 (NP&W Act)* and the policies of the National Parks and Wildlife Service (NPWS). 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.

The plan of management is a statutory document under the *NP&W 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.

Other legislation, international agreements and charters also apply to management of the area, notably the World Heritage Management Principles set out in the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

REGIONAL FOREST AGREEMENT

Under the Upper North East Forest Agreement 1999 (FA) and the Regional Forest Agreement for North East NSW (RFA), all forest managers including the NPWS must demonstrate ecologically sustainable forest management (ESFM).

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.

Ecologically Sustainable Management is an over-riding management principle and will be applied to all ecosystem types, not just forests. It will be implemented primarily through monitoring to provide feedback on management programs and directions for future adaptive management. Performance indicators of ESFM are specified in the FA and RFA.

NPWS is developing monitoring and data management systems to facilitate better achievement of ESFM and to satisfy associated reporting requirements. The tri-annual 'State of the Parks' report is a key mechanism by which NPWS demonstrates its commitment to ESFM.

WORLD HERITAGE

The International Convention for the Protection of the World Cultural and Natural Heritage was adopted by the United Nations Educational, Scientific and Cultural Organisation in 1972, and ratified by Australia in 1974. The Convention provides a framework for international cooperation in the recognition and protection of cultural and natural heritage of outstanding universal value.

The planning area incorporates five separate areas that are part of the World Heritage CERRA (refer to *4.1 World Heritage*). The management of CERRA World Heritage parks and reserves is required to be consistent with Australia's obligations under the World Heritage Convention. In this regard, the plan seeks to ensure the identification, protection, conservation, presentation and rehabilitation of the World Heritage values of the planning area so they can be transmitted to future generations.

The *Strategic Overview for the Management of the World Heritage Central Eastern Rainforest Reserves (Australia)* (CERRA 2000) provides broad direction on management across CERRA to achieve these obligations. The NSW, Queensland and Commonwealth Governments have endorsed the Strategic Overview as policy. This plan is consistent with the strategies outlined in the Strategic Overview.

This plan of management also seeks to address the Australian World Heritage Management Principles set out in the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. In addition to World Heritage Convention obligations, these principles include provisions for community and stakeholder consultation, Commonwealth accreditation of state management plans and environmental impact assessment for any actions that are likely to have a significant impact on World Heritage values.

THREATENED SPECIES

In managing populations of threatened species and critical habitat, the NPWS has responsibilities in accordance with the *Threatened Species Conservation Act 1995 (TSC Act)*. This includes preparing Recovery Plans for threatened species, populations and ecological communities, in addition to developing Threat Abatement Plans to manage key threatening processes.

ENVIRONMENTAL IMPACT ASSESSMENT

The NPWS is required by the *Environmental Planning and Assessment Act 1979 (EP&A Act)* to assess the environmental impacts of activities it is undertaking and the activities of others.

Prior to any works or activities being undertaken within the planning area, an environmental impact assessment will be undertaken pursuant to the *EP&A Act*. The level of environmental assessment will depend upon the work or activity proposed and the associated degree of impact.

2.2 MANAGEMENT OBJECTIVES

The *NP&W Act* establishes management principles for national parks and nature reserves as stated below:

National parks are to be managed to:

- a. conserve biodiversity, maintain ecosystem functions, protect geological and geomorphological features and natural phenomena and maintain natural landscapes;
- b. conserve places, objects, features and landscapes of cultural value;
- c. protect the ecological integrity of one or more ecosystems for present and future generations;
- d. promote public appreciation and understanding of the park's natural and cultural values;
- e. provide for sustainable visitor use and enjoyment that is compatible with conservation of natural and cultural values;
- f. 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;
- g. provide for appropriate research and monitoring (section 30E).

Nature reserves are to be managed to:

- a. conserve biodiversity, maintain ecosystem functions, and protect geological and geomorphological features and natural phenomena;
- b. conserve places, objects, features and landscapes of cultural value;
- c. promote public appreciation, enjoyment and understanding of the reserve's natural and cultural values;
- d. provide for appropriate research and monitoring (section 30J).

World Heritage areas. Derived from the World Heritage Convention and its Operational Guidelines the following key management principles, which are consistent with the Australian World Heritage management principles, have been developed for CERRA (CERRA 2000):

- a. identify, protect, conserve, present and, where necessary, rehabilitate the World Heritage values of the property;
- b. integrate protection of the property into a comprehensive planning program;
- c. give the property a function in the life of the Australian community;
- d. strengthen appreciation and respect for the property's World Heritage values, particularly through educational and information programs, and keeping the community broadly informed about the condition of the World Heritage values of the property;
- e. take the appropriate scientific, technical, legal, administrative and financial measures necessary for implementing these principles;
- f. provide for continuing community and technical input in managing the property; and
- g. manage the broad range of values, both World Heritage and non-World Heritage, ensuring that achieving the long-term conservation of the reserves' World Heritage values is the over-riding principle.

3 MANAGEMENT DIRECTIONS

The primary emphasis of this plan is the conservation of the natural, cultural and World Heritage values of the planning area. Visitor opportunities that are compatible with and promote the understanding and enjoyment of these values is also a key emphasis. The visitor facility type and scale of development will be in accordance with the Recreation Planning Framework (NPWS 2003) prepared for the Northern Directorate, and as outlined in table 2 of this plan. This will be achieved through the following:

- protection of the World Heritage rainforest, other significant vegetation communities and threatened plant and animal species through managing fire, disturbed areas, introduced species, access and visitor use;
- recognition and protection of traditional and contemporary Aboriginal cultural heritage through cooperative management with the local Aboriginal community;
- protection of historic heritage through identifying, recording and conserving historic resources;
- protection and enhancement of scenic values through retention of forested landscapes and ensuring the design, location and management of park facilities is not visually intrusive;
- protection of water catchment values through managing fire, roads, trails and tracks and visitor areas including appropriate waste disposal;
- provision of an access network of roads, management trails and walking tracks that is compatible with regional recreation opportunities and management objectives;
- provision of recreation opportunities focused at existing day use and camping areas whilst recognising complementary recreation opportunities provided nearby;
- provision of interpretive and educational opportunities through signage, park brochures and activities to assist visitor understanding and enjoyment of park values; and
- improving knowledge of natural and cultural heritage, corresponding threats and the evaluation of management programs through research and monitoring.

4. CONSERVATION OF NATURAL AND CULTURAL HERITAGE

4.1 WORLD HERITAGE

The planning area contains five separate areas that are part of the World Heritage CERRA property. They represent natural heritage of international significance, particularly as a refuge of ancient rainforest communities with evolutionary links to Gondwana and a high diversity of plants and animals (refer to *Appendix 1 World Heritage CERRA values*).

These five areas were all former State Forest Flora Reserves and were World Heritage listed in 1994. They are Murray Scrub and Dome Mountain in Toonumbar NP, Bungdoozle and Cambridge Plateau in Richmond Range NP and Mallanganee in the northern part of Mallanganee NP (see figure 1). Other parts of the planning area, however, have similar World Heritage values and will be managed accordingly. In time, it is anticipated that these areas may be added to the World Heritage CERRA.

An understanding of key World Heritage values and the ecological processes that maintain them is necessary for their conservation. The provision of information, training and interpretive programs for visitors, park neighbours and NPWS staff is necessary to achieve this understanding.

Potential threats to the World Heritage and natural heritage values of the planning area include unplanned fire, introduced plants and animals, inappropriate visitor use and management operations. The management of these issues is addressed in the following sections of this plan.

Desired outcomes

- ◆ The World Heritage values of the planning area are *identified, protected, conserved, presented* and, where necessary, *rehabilitated* in accordance with the principles of the World Heritage convention.

Guidelines and Actions

- Manage the planning area consistent with the principals of the World Heritage Convention (refer to *4.3 Biodiversity, 5.3 Introduced Plants, 5.4 Introduced Animals, 5.5 Fire Management, 6.0 Recreation, 7. Research & Monitoring*).
- Facilitate research, training and interpretive programs that contribute to a greater understanding of the World Heritage values of the planning area by visitors, park neighbours and NPWS staff (refer to *6.7 Visitor Information; 7. Research*).

4.2 LANDFORMS AND SCENIC LANDSCAPES

The underlying geology of the planning area consists of sandstones, siltstones and shales. These are sedimentary material deposited by ancient rivers during the Mesozoic era (135 – 235 million years ago) and uplifted along fault lines that flank both sides of the Richmond Range. These are overlain in places by basalt flows associated with the Focal Peak shield volcano and its subsidiary vents located in the planning area. This volcano was centred near Mt Barney to the north in Queensland and was active about 24 million years ago.

The basalts are most prominent in Toonumbar NP, around the former Bungdoozle and Cambridge Plateau Flora Reserves in Richmond Range NP and in the south-west of Mallanganee NP. They weather to form krasnozems and chocolate soils which are fertile, relatively stable and well drained and support rainforest communities (refer to *4.3 Biodiversity*). In other areas such as the more exposed ridges and slopes, the sedimentary parent material has been exposed by erosion and created red and yellow podsollic soils of lower fertility, stability and permeability than those of basaltic origin (refer to *5.1 Soil Conservation*).

The planning area is dominated by the north-south running Richmond Range and has a elevation range between 70m and 920m. The high elevation volcanic plugs of Glassy Mountain (920 m), Dome Mountain (915 m) and Edinburgh Castle (893 m) dominate the landscape of the western part of Toonumbar NP. Over millions of years, Iron Pot Creek has scoured through this basalt to form the Murray Scrub basin which dominates the landscape in the south eastern part of Toonumbar NP.

Richmond Range NP largely consists of a north-south orientated part of the Richmond Range. It is flanked on both sides by moderate to steep slopes that give rise to many creeks that fall into the Richmond River valley to the east and the Clarence River valley to the west. Mallanganee NP also occurs on the Richmond Range. Hogarth Range NR occupies part of the Hogarth Range which is an easterly extension of the Richmond Range (see figure 1).

The elevated relief of the planning area contrasts with the surrounding gently undulating broad valleys. The prominent forested ridgelines, plateaus and gullies of the planning area are highly visible to people travelling on the nearby Summerland Way and Bruxner Highway and form a mountainous backdrop to the towns of Kyogle, Casino, Mallanganee and Bonalbo. These large contiguous forested areas are representative of the landscape prior to European settlement.

The main threat to regional scenic values include the management and development of infrastructure such as transmission towers and lines located in visually prominent locations. Existing infrastructure such as the Toonumbar fire tower in Toonumbar NP, a transmission tower at Mt Babyl and stock fencing along the Cambridge Forest Road in Richmond Range NP need to be managed to minimise visual impacts (refer to 8. *Other Uses*).

Desired Outcomes

- ◆ Scenic values are protected from visual impacts caused by infrastructure works and development.

Guidelines and Actions

- Minimise visual impacts associated with existing disturbed areas and infrastructure sites including minimum vegetation removal to maintain clearances for transmission towers, lines and fencing (refer to 8. *Other Uses*).
- Assess the visual impacts of proposed works and development as part of the overall environmental assessment. Proposals assessed to have unacceptable impacts on natural landscape values will not be approved.
- Locate, design and use appropriate materials for park facilities in accordance with the *NPWS Guidelines for Park Facilities* to maintain visual quality.

4.3 BIODIVERSITY

Biological diversity, or biodiversity, is the variety of life forms that interact to support and sustain the balance of nature.

The planning area is within one of the most bio-diverse regions in Australia. This rich biodiversity reflects the complexity and diversity of the vegetation communities (refer to *Appendix 2, Vegetation Communities of the Planning Area*). Many plant species reach either their western or eastern limits around the planning area. This is particularly true for many of the rainforest species found.

The planning area contains important examples of subtropical and dry rainforests (refer to *Appendix 2, Vegetation Communities of the Planning Area*). Many of these rainforest areas are World Heritage listed as part of the Central Eastern Rainforests Reserves of Australia (CERRA) (refer to 4.1 *World Heritage*). The dry rainforest of Mallanganee NP is considered to be one of the best examples of this forest type in NSW (Floyd, 1980). Rainforests support a diversity of threatened animal species, particularly fruit eating pigeons, owls and a diversity of mammals such as wallabies, pademelons, native rodents, gliders, koalas and the spotted-tailed quoll.

The wet sclerophyll forests of the northern Richmond Range are also significant because the dominant canopy tree is the Richmond Range spotted gum, a form of *Corymbia variegata* (Hunter, 1999). This species has a limited distribution and the planning area contains a core area of this uncommon plant community.

Heath containing *Chinochloa pallida* and *Pultenaea retusa* is found at Edinburgh Castle. This has a restricted distribution.

The planning area contains a diversity of old growth forest habitat. This includes large areas of old growth subtropical rainforest and one of the largest areas of old growth flooded gum *Eucalyptus grandis* wet sclerophyll forest in northern NSW. Old growth forest is characterised by mature trees with a greater abundance of tree hollows, large fallen logs and a complex understorey. It provides shelter and food resources that do not occur in younger forests and provides higher diversity and abundances of some animals such as glider and owl species.

The NSW Biodiversity Strategy (NPWS 1999) identifies a number of broad categories of threat that continue to have a deleterious effect on biodiversity. These include introduced species and diseases; inappropriate fire regimes; and a number of other threats of human origin. Other sections of this plan seek to address these threats (refer to 5.3 *Introduced Plants*, 5.4 *Introduced Animals*, 5.5 *Fire Management*, 6 *Recreation*, 8. *Other Uses*, 9. *Management Facilities and Operations*).

Populations of bell-miners (*Manorina melanophrys*), also known as bellbirds, may also be a threat to biodiversity as they appear to be associated with eucalypt dieback areas. This is particularly evident in Toonumbar and Richmond Range NPs. The impact of previous logging activities has altered the forest structure and encouraged the establishment of weeds, particularly lantana (*Lantana camara*) in the understorey. Bell-miners favour these disturbed forest habitats and aggressively protect their territories from other birds, including insectivorous birds. This may result in sap-sucking insect populations rising to damaging levels and leading to tree dieback. This further modifies the natural vegetation community and favours the establishment of understorey weeds such as lantana.

Significant eucalypt dieback has occurred in the planning area where dense infestations of lantana are affecting the natural regeneration of the forest. The NPWS have undertaken mapping of the extent of eucalypt dieback in the planning area and are researching management strategies in liaison with other agencies.

Eleven plant species and thirty-six animal species recorded in the planning area are listed as endangered or vulnerable under the *Threatened Species Conservation Act 1995* (refer to *Appendix 3 – 4 Threatened Species in the Planning Area*). A number of these and other species are restricted to, or reach their geographic limit of distribution, in the region.

Threatened animal species restricted to the planning area include an undescribed frog *Philoria* sp.3 and two newly described freshwater crayfish *Euastacus gumar* (Coughran, 2000) and *E. mirangudjin* (Coughran, 2000). The large flightless black beetle (*Nurus brevis*) has been recorded near Mallanganee NP and is listed as an endangered species under the TSC Act. The Richmond Birdwing Butterfly (*Ornithoptera richmondia*) reaches its western limits here.

The endangered shrub *Rapanea* species 'A' has been recorded in the planning area in association with wet sclerophyll communities. At these sites, habitat degradation has occurred following intensive logging, road and trail works and due to weed invasion. Competition from weeds, particularly pink-flowered lantana (*Lantana camara*), is a threat to all populations of threatened plants. To reduce these threats, ongoing weed control and habitat restoration has been initiated (refer to 5.3 *Introduced Plants*).

The endangered native jute (*Corchorus cunninghamii*) has been recorded from Toonumbar National Park and adjacent state forest plantations.

Threatened species require special management consideration to promote the recovery of their populations. Under the *TSC Act*, Recovery Plans and Threat Abatement Plans are to be prepared for threatened species and threatening processes respectively. These plans outline specific management actions to promote the recovery of threatened plant and animal populations. Until these plans are prepared, there are a number of existing programs in place or proposed for the management of threatened species.

Further surveys targeting threatened species are also required to ultimately determine any long-term impacts associated with road and trail maintenance, fire management and weed invasion.

Desired Outcomes

- ◆ The full range of native plants and animal species found in the planning area are conserved including the habitat and populations of threatened species.
- ◆ The diversity, structure and habitat values of vegetation communities are conserved and restored where subject to past disturbance.

Guidelines and Actions

- Implement Recovery Plans and/or Threat Abatement Plans upon their completion (refer to *Appendices 3 and 4, Threatened Species*).
- Undertake weed control and habitat restoration works to protect populations of the endangered *Rapanea* species 'A' (refer to 5.3 *Introduced Plants*). Prepare and implement a road maintenance strategy with SFNSW to protect roadside populations.
- Undertake weed control and habitat restoration works at known Richmond birdwing butterfly (*Ornithoptera richmondia*) habitat areas.

- Undertake rare plant surveys in areas where disturbance is possible, such as along roads, trails and tracks, where required.
- Implement a marker system throughout the road and trail network to avoid damage to threatened plant species from road works or weed control programs.
- Monitor populations of the endangered native jute (*Corchorus cunninghamii*) to determine threats and requirements for fire and weed management.
- Assess vegetation communities, habitats and native plant and animal species considered significant to improve management information and revise management practices accordingly.
- Research potential management strategies to control eucalypt dieback, including controlling population imbalances of bell miners and the role of forest regeneration, in cooperation with other relevant agencies.

4.4 ABORIGINAL HERITAGE

The planning area is amongst a landscape that is part of the identity, spirituality, connection and resource base for the Aboriginal people of the Bundjalung Nation. The local Aboriginal people maintain a strong sense of Aboriginal identity and a close affiliation with the landscape of the planning area (Smith, 1993).

The planning area is of great importance to local Aboriginal people and to their traditional laws, customs, beliefs and culture. This includes the network of cultural sites such as creation places, ceremonial sites, traditional pathways and evidence of past occupation. Research conducted indicates that Aboriginal sites and places of significance are widely distributed throughout the forested uplands of the planning area indicating that these areas were intensively occupied (Smith, 1993).

NPWS recognises that Githabul peoples will be able to continue their traditional hunting and fishing activities in the areas where ever they continue to hold native title rights to do so. NPWS understands that the nature and extent of those rights are yet to be resolved.

There may be other cultural sites that have not been recorded. It is important that cultural sites are recorded in the NPWS Aboriginal Heritage Information Management System to ensure management activities do not unintentionally impact on cultural values. The NPWS, including its Northern Aboriginal Heritage Unit, are responsible for matters relating to Aboriginal relics.

While the NPWS currently has legal responsibility for the protection of Aboriginal sites, the NPWS acknowledges the right of local Aboriginal people to be part of the decisions about their own heritage. Consultation has traditionally occurred with local Aboriginal people through Local Aboriginal Land Councils. The planning area falls within three Local Aboriginal Land Councils: Gugin-Gudduba Land Council based at Kyogle; Mulli Mulli Land

Council based at Woodenbong, and Jubullum Land Council based at Tabulam.

More recently, the NPWS have also consulted with the Bundjalung Council of Elders, Native Title claimants, local Aboriginal elders and custodians or their representatives regarding Aboriginal interests in park management. Cooperative management agreements between the NPWS and local Aboriginal groups can assist to ensure appropriate representation of Aboriginal interests in park management.

The planning area is currently subject to two registered Native Title claims: NC95/11 (Githabul peoples) and NC96/14 (Tabulum Bundjalung People #1). The Gullibal people have also indicated to the National Native Title Tribunal their native title rights and interests over part of the planning area.

Desired Outcomes

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

Guidelines and Actions

- Prepare a management agreement between the NPWS and representatives of the Aboriginal community and include communication protocols, cultural assessment of management activities, information management and appropriate interpretation, research and traditional use.
- Continue to consult with and involve the Bundjalung Council of Elders, local Aboriginal elders, Native Title Claimants, custodians, relevant local Aboriginal Land Councils and other representatives in park management.
- Progressively record all Aboriginal cultural sites and/or places of significance and update the Aboriginal Heritage Information Management System.
- Protect all Aboriginal sites, relics, historic places and culturally significant features from damage by human activity and fire. Prepare management strategies where necessary in consultation with representatives of the Aboriginal community.
- Undertake cultural heritage assessments for all new works and developments in partnership with representatives of the Aboriginal community.
- Support Aboriginal community proposals to undertake interpretation of Aboriginal cultural values of the planning area (refer to *6.7 Visitor Information*).
- In partnership with the local Aboriginal community, the NPWS will investigate options for joint management under Schedule 14 of the NPWS Act.

4.5 HISTORIC HERITAGE

The planning area contains a number of historic sites and has strong associations with the early European settlement of the region in the 1840s (refer to *Appendix 5, Historic Resources of the Planning Area*).

Grazing has been associated with the planning area since the early settlement of the region. In the 1850s, large sheep and cattle runs spread to the Richmond Range from the adjoining Richmond and Clarence valleys. In the early 1920s, grazing by bullock teams used to haul timber was described as an 'integral part' of the Richmond Range forests (Blackmore & Associates, 1993).

Early timber getting has also been associated with the planning area since the early settlement of the region. The timber industry was second only to agriculture in contributing to the early economic development of the region. The planning area featured in all stages of development of the regional timber industry. Early stages include the cutting of red cedar from 1842 to the 1880s and hoop pine from the early 1890s to the 1940s, supplemented with the cutting of rainforest timber species and eucalypts.

State Forest's use of the area involved use of the forest for a range of forest uses, including recreation, grazing and bee keeping. Infrastructure was provided for these uses, including visitor facilities. Many of these uses and facilities are still evident and continue as uses of the planning area to this day.

Material remains of forestry activity include timber loading and milling sites, foresters' camps, marked boundary trees and log haul tracks and roads (Blackmore & Associates, 1993). Logging continued as the main use of the planning area throughout the twentieth century until its gazettal as national park estate in 1995 and 1999.

The Richmond Range was established as a tick quarantine area boundary in 1923. Fence lines were later erected to control the movement of stock across the Range and maintained until restrictions were lifted in 1988. Some of the fence line and gates still exists along parts of the Richmond Range in the planning area. These are mostly in disrepair and NSW Agriculture has indicated no further interest in retaining the fences or gates (refer to 8. *Other Uses*).

A stock inspection point was also established at the crest of the Range at Mallanganee and was staffed 24 hours a day. In 1947, a former SFNSW Occupation Permit was issued to the Board of Tick Control over 3 hectares of land now in the north west corner of Mallanganee NP for an inspector's residence and associated pasture. In 1984, the permit area was reduced to 1 hectare for the residence. The residence was demolished in the 1990s after the stock movement restrictions were lifted.

The NPWS *Historic Resources Conservation and Management Policies* (NPWS, 1988) outlines obligations in the conservation of cultural heritage resources and ascribes to the principles of The Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (The Burra Charter) (ICOMOS, 1992). Under this Charter, historic resources need to be recorded and assessed to determine their frequency (ie rarity), condition and significance. Conservation plans are prepared for historic resources assessed under the Charter to be of high significance. These plans identify and prioritise any preservation, restoration, reconstruction and adaptation works required.

Historic resources are listed on the NPWS Historic Places Register and the NSW State Heritage Register. Historic sites within the planning area currently listed on these registers are identified in Appendix 5. Cultural heritage assessments are undertaken for all proposed works and activities to ensure identification and protection of historic items.

Desired Outcomes

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

Guidelines and Actions

- Develop management strategies to protect blazed trees in Toonumbar and Mallanganee NPs including their protection from fire.
- Encourage research in the identification and documentation of historic features of the planning area and record them on the NPWS Heritage Register. Involve local historical societies and interested members of the public where possible.
- Interpret Peacock Creek visitor use area as being a former State Forests area.

5. PARK PROTECTION

5.1 SOIL CONSERVATION

The erosion potential of the soil types of the planning area (refer to 4.2 *Landforms & Scenic Landscapes*) is generally described as low to moderate. However, the susceptibility of these soil types to erosion significantly increases in areas with steep slopes and during periods of high rainfall.

Accelerated rates of soil erosion can occur along roads, trails and tracks if adequate drainage is not maintained (refer to 9. *Management Facilities and Operations*). Bare ground remaining from past disturbances, such as old log dumps, quarries and borrow pits, also need to be managed to minimise erosion and subsequent sedimentation of waterways.

Desired Outcomes

- ◆ Soil erosion is minimised for all site works and disturbed areas through erosion and sediment control.

Guidelines and Actions

- Incorporate erosion and sediment control in all management activities involving soil disturbance.
- Rehabilitate disturbed areas such as former log dumps, quarries and borrow pits through controlling access, drainage, erosion control and revegetation.

5.2 WATER CATCHMENT

The planning area forms part of the upper catchments of both the Richmond and Clarence Rivers, the main river systems of the far north coast of NSW. The Richmond Range separates these two catchment areas with the eastern side of the Range draining into the Richmond River and the western side into the Clarence River.

The planning area is important for providing large forested watersheds in the headwaters of these major rivers. These upper catchment areas harness much of the region's rainfall to provide reliable high quality water to downstream waterways and users. Forest run-off is estimated to average 25-30% of rainfall (SFNSW, 1995).

Iron Pot Creek is the main supply of the Toonumbar Dam. This dam is located to the east of Richmond Range NP and is managed by the Department of Land and Water Conservation. This dam supplies irrigation water for the local area and contains a small hydro-electricity scheme that is managed separately by Rous County Council. Gorge Creek and Peacock Creek, which rise in the planning area, provide the water supply for the township of Bonalbo. Most other creeks rising in the planning area are ephemeral and consist of dry creek beds during the drier winter and spring months.

Pit toilets at the main visitor areas have been replaced with compost toilet systems. These systems need to be maintained and monitored to ensure ground water is not polluted.

The *Catchment Management Act 1989* provides an umbrella framework which aims to improve water quality, erosion control, vegetation cover and the maintenance of ecological processes in water catchments. An important means of achieving these aims is through regional catchment management boards. The planning area is within the area of the Northern Rivers and the Upper North Coast Catchment Management Boards.

Desired Outcomes

- ◆ Catchment values, water quality and the health of waterways are maintained or improved.

Guidelines and Actions

- Incorporate water pollution control for all works and developments including:
 - maintenance of composting toilet systems at visitor areas;
 - erosion and sediment control and rehabilitation of disturbed areas (refer to *5.1 Soil Conservation*);
 - boundary fencing to exclude livestock (refer to *5.4 Introduced Animals*); and
 - maintenance of roads, trails and walking tracks (refer to *9, Management Facilities and Operations*).
- Support the catchment management initiatives of the Department of Land and Water Conservation and the Northern Rivers and Upper North Coast Catchment Management Boards.

5.3 INTRODUCED PLANTS

Introduced plants, commonly known as weeds, are those plants that are not native to the area. Weeds in the planning area are of concern as they can impact on forest structure, species diversity, habitat values, prevent natural regeneration and have the potential to spread to and from neighbouring land.

The *Noxious Weeds Act 1993* places an obligation upon public authorities to control noxious weeds on land that they occupy to the extent necessary to prevent such weeds spreading to adjoining lands.

Noxious weeds occurring within the planning area include: groundsel bush (*Baccharis halimifolia*); red-flowered lantana (*Lantana camara*); crofton weed (*Ageratina adenophora*); mistflower (*Ageratina riparia*); and giant Parramatta grass (*Sporobolus indicus var. major*). Control programs are in place for giant Parramatta grass and groundsel bush in Toonumbar, Richmond Range and Mallanganee NPs.

Significant areas of lantana (*Lantana camara*) occur within Toonumbar, Richmond Range and Mallanganee National Parks, particularly in areas that were previously logged. Past logging activities have altered the forest structure by reducing canopy cover, thereby encouraging the establishment of weeds in the understorey. These changes have suppressed the processes of natural regeneration and succession. The resulting changed habitats have also affected native animal communities (refer to 4.3 *Biodiversity*).

Off-park plantings of Cadaghi (*Corymbia torrelliana*), a species that does not naturally occur in the area, has been noted to hybridise with Richmond Range Spotted Gum (*Corymbia variegata*) in the Richmond Range (pers. comms. B. Scott, 29 May 2001). The hybridising of eucalypts in the planning area with plantation eucalypts is a potential threat to their genetic integrity (refer to 4.3 *Biodiversity*; and 7. *Research & Monitoring*).

Three small plantation areas consisting of hoop pine, flooded gum and/or blue gum occur in Toonumbar NP from former state forest trials. Harvesting of the hoop pine plantation at the northern end of the Murray Scrub trail was considered prior to park gazettal but was not economically viable. The plantation has an understorey of regenerating rainforest species and will be allowed to regenerate without significant management intervention. The restoration requirements of two small plantations off North Yabbra Road are yet to be assessed.

The NPWS Northern Rivers Region Pest Management Strategy provides management direction at a regional level for weed control and forest regeneration plans and programs. Restoration and Rehabilitation Plans for specific parks and reserves provide more detailed strategies and work programs.

A Restoration & Rehabilitation Plan has been prepared for Mallangane NP, outlining weed species within the park and recommending control techniques and priorities. Implementation of works identified as a high priority has been completed for the northern portion of the park adjacent to the Bruxner Highway. This project, funded by a National Heritage Trust grant, focussed on the control of a serious infestation of madeira vine (*Anredera cordifolia*). Other sites such as the former tick inspector's house in Mallangane NP have been identified as suitable for minor regeneration projects.

Desired Outcomes

- ◆ Degraded areas are restored by undertaking appropriate weed control programs designed to facilitate natural regeneration and succession.
- ◆ Community awareness is raised regarding the impacts of environmental and noxious weed species.

Guidelines and Actions

- Implement the Rehabilitation and Restoration Plan for Mallangane NP. As a priority, undertake follow-up weed control for madeira vine in the northern section of the park.
- Prepare and implement restoration and rehabilitation plans for Richmond Range and Toonumbar NPs and Hogarth Range NR.
- Continue control programs for groundsel bush and giant Parramatta grass in Toonumbar and Richmond Range NPs.
- Assess the restoration requirements for the two plantation areas on North Yabbra Road in Toonumbar NP and undertake any restoration works necessary.
- Interpret past land use and the trials at the lantana control plots.
- Continue to liaise with the Far North Coast County Council and park neighbours regarding weed control programs including the impacts and control for environmental weeds. Report any new weed occurrences in the area to the County Council.

5.4 INTRODUCED ANIMALS

Introduced animals are those animals not native to the area such as wild dog (*Canis familiaris*), feral cat (*Felis catus*), feral goat (*Capra hircus*), fox (*Vulpes vulpes*) and stray stock. A range of environmental impacts are caused by these animals.

The *Rural Lands Protection (RLP) Act 1998* requires pest animals declared under the Act to be controlled. Wild dogs, including dingoes, have been declared throughout NSW and hence, the NPWS has a statutory obligation to control wild dogs on its estate.

Wild dogs and dingoes (*Canis lupus dingo*) can inflict losses and disruption to livestock on rural lands adjoining the planning area. Wild dog control is currently undertaken by the Casino Rural Lands Protection Board (RLPB) in conjunction with local landholders to minimise stock losses. The NPWS and Rural Lands Protection Board regularly liaise regarding the management of pest animals.

Under the *RLP Act*, public lands considered to contain high quality dingo habitat have been listed as dingo management areas. This includes Richmond Range and Toonumbar NPs. The *RLP Act* requires the public land managers, such as the NPWS, to assist in the preparation of a wild dog management plan for dingo management areas. These plans are to identify methods for the control of wild dogs and the conservation of dingoes in these areas and are to be approved by the local RLPB.

Feral cats and foxes are widespread throughout the region and known to occur in the planning area. There is a high diversity of native animals in the planning area that are susceptible to predation from feral cats and foxes. Foxes are listed as a key threatening process under the *Threatened Species Conservation Act 1995*. The draft Fox Threat Abatement Plan has identified the need to control foxes in parts of the planning area to protect the rufous bettong (*Aepyprymnus rufescens*).

A population of Rusa deer (*Cervus timorensis*) have been recorded near the township of Bonalbo to the west of Richmond Range NP. Local authorities are attempting to eradicate them before they establish in the local area.

Cane toads (*Bufo marinus*) are not yet established within the planning area. It is likely that individual cane toads may be inadvertently transported to the planning area by vehicles from nearby areas where they are common.

A significant proportion of the planning area adjoins beef cattle properties. These boundaries are normally fenced unless terrain is sufficient to exclude stock movement. The maintenance and where necessary further improvement of these fences is essential for the effective management of stock and the protection of reserve values. This commitment between neighbours and the NPWS is an ongoing requirement for the planning area. Fencing agreements are negotiated with neighbours in accordance with NPWS fencing policy. Priorities for fencing are generally established considering the condition of the existing fence line and potential conflicts with park management objectives.

The NPWS Northern Rivers Region Pest Management Strategy provides management direction at a regional level for the control of introduced animals. Pest management plans for specific parks and reserves provide more detailed strategies and work programs.

Desired Outcomes

- ◆ A reduction of the distribution and impact of introduced animals, particularly predation by foxes on rufous bettong.
- ◆ New populations of vertebrate pest species are prevented from establishing in the area, particularly feral deer and cane toads.
- ◆ Boundary fencing is adequate to exclude domestic stock from entering the planning area.
- ◆ Community awareness is raised regarding the impacts and appropriate control of pest animals.

Guidelines and Actions

- Prepare pest animal management plan(s) for the planning area.
- Implement the Fox Threat Abatement Plan as it relates to the planning area to reduce native animal predation, particularly on rufous bettong populations.
- Assist in the preparation and implementation of a wild dog management plan to be approved by the Casino Rural Lands Protection Board.
- Continue to liaise with the Casino Rural Lands Protection Board and park neighbours regarding pest animal control programs.
- Continue to cooperate with neighbours to ensure adequate boundary fencing and, where required, negotiate fencing agreements in accordance with NPWS policy.
- Provide information to the community regarding the impacts of wild dog, feral cats, foxes, deer and goats and encourage off-park control programs to assist conservation of native animal populations.
- Provide information to park neighbours regarding the identification and control of cane toads in order to prevent their colonisation in the planning area.
- Encourage the community to report any new occurrences of pest animals.

5.5 FIRE MANAGEMENT

Under the *Rural Fires Act 1997*, the NPWS has a statutory obligation to protect life and property and to prevent fire from leaving its property. This Act also provides for the protection of the environment by requiring that fire management activities have regard to the principles of ecological sustainability.

The primary aims of fire management within the planning area in accordance with the NPWS policy are to:

- reduce the risk of bushfire to life and property both within and immediately adjacent to the planning area;

- effectively manage bushfires for the protection and conservation of the natural, cultural, scenic and recreational features; and
- cooperate with other relevant organisations in fire management planning.

The NPWS regards fire as a natural phenomenon and one of the continuing physical factors influencing the Australian environment. Many native plants and animals of dry sclerophyll communities have adapted to particular fire regimes. A fire regime refers to the frequency, season, intensity and spatial extent of fire. Inappropriate fire regimes have been identified as a key threatening process affecting the biological diversity of NSW.

Rainforest, including areas of dry rainforest and wet sclerophyll communities, are largely intolerant of fire. These communities account for a large proportion of the vegetation in the planning area. Whilst these vegetation types are less fire prone, fires that can occur are a key threat to these plant communities and the animals that rely on them.

The NPWS also recognises that fire may pose a serious threat to life and property. Where life and property values are directly threatened by fuel conditions, NPWS policy dictates that all steps will be taken to minimise risks, with other management needs regarded as secondary considerations.

The NPWS also recognises that fire and fire management activities may pose a threat to cultural values such as Aboriginal sites and historic relics. Fire management particularly needs to avoid damage to cultural resources from fire or through the use of heavy machinery.

Fire frequencies within the planning area are relatively low. Most fire events have been as a result of prescribed fires as a part of previous state forest fire management. However, records indicate that significant unplanned fire events have occurred in 1994 and 2000. Most unplanned fire events have started on neighbouring properties although there has been some instances of arson on-park.

Adjacent land uses are mainly primary industries including beef cattle and timber production. Beef cattle areas are generally at low risk from bushfire and are mostly located downslope reducing the threat of fire from the planning area entering these properties.

Adjacent timber production areas include native forests and softwood plantations managed by SFNSW and joint venture hardwood plantations on private lands. These areas represent significant assets that may be impacted by fire and require cooperative fire management between the NPWS and other agencies.

Fire management is recognised as an important and complex area of park management. This plan of management provides the overall objectives and direction for fire management in the planning area. However, a separate fire management strategy will detail a comprehensive analysis of the bushfire environment, potential threats and specific management actions and priorities.

The NPWS is an active member of the Kyogle District Bushfire Management Committee formed under the *Rural Fires Act 1997*. This Committee plays a lead role in bushfire management across the district including the coordination of resources and cooperative fire management arrangements.

The NPWS also acknowledges that the support of the local community, particularly the cooperation of park neighbours, is critical to successful fire management within the planning area.

Desired Outcomes

- ◆ Life and property both within and adjacent to the planning area are protected from fire.
- ◆ Fire regimes are managed to protect and conserve the natural, cultural, scenic and recreational values of the planning area.
- ◆ Aboriginal sites and artefacts are protected from the impacts of fire and fire related management activities.

Guidelines and Actions

- Prepare and implement a fire management strategy for the planning area.
- Until a fire management strategy is prepared, manage fire in accordance with NPWS policies and the Kyogle Bush Fire Risk Management Plan.
- Manage fire regimes to protect biodiversity in accordance with the identified fire frequency thresholds for each vegetation group across the landscape (refer to *Appendix 6, Acceptable Fire Thresholds for Plant Groups*).
- Involve representatives of local Aboriginal people in the preparation of fire management strategies to ensure that fire management activities do not impact on Aboriginal sites and/or places of significance.
- As far as possible, minimise the use of heavy machinery off established management trails for bushfire control.
- Continue active participation in the Kyogle District Bushfire Management Committee.

6. RECREATION

6.1 PUBLIC VEHICLE ACCESS

The road network associated with the planning area has a number of different tenures. 'Public roads' are roads outside the planning area that are managed by Kyogle Council. 'Park roads' are roads in national parks that are available for public vehicle access and managed by the NPWS. 'Management trails' are maintained to a lower standard than park roads and are essentially for fire and weed management by the NPWS. These trails are not available for vehicle use by the general public, excepting authorised access by park neighbours or researchers and where trails are designated as available for horse riding (refer to *6.4 Horse riding; 9. Management Facilities & Operations*). There are also state forest roads and trails adjacent to the planning area that are managed by SFNSW.

Park roads are generally maintained to dry-weather two-wheel drive standards and provide public vehicle access to day use and camping areas (see figure 1). Park roads in the planning area include the southern section of Murray Scrub Road in Toonumbar NP, the Cambridge Plateau Forest Road in Richmond Range NP and the northern section of Cherry Tree Road in Mallanganee NP.

The Cambridge Plateau Forest Road is a 32 km unsealed park road in Richmond Range NP. It provides a half-day drive through spectacular scenery ranging from tall spotted gum forest to subtropical rainforest. It provides visitor access to day use and camping areas in the park. This park road is generally dry-weather two-wheel drive accessible. During wet conditions, the road may be temporarily closed due to the road surface becoming untrafficable in areas. Signage is used at park entry points to notify road users of any temporary road closures.

Murray Scrub Road in the south eastern part of Toonumbar NP provides public vehicle access to the Murray Scrub Walk and Iron Pot Creek day use and camping area. The entry road and car park for the Murray Scrub walk require works to improve them to a two-wheel drive standard.

Under the previous state forest tenure, much of the road and trail network was managed to a standard suitable for logging trucks and was available for public use. Under national park tenure, the road and trail network is required to be rationalised to protect habitat values and provide sustainable access for visitor use, NPWS management programs and in some cases adjacent land uses under access agreements.

In Toonumbar NP, the section of Toonumbar Forest Road north of the Murray Scrub Road and south of the Cox's Road intersection, will be available for public vehicular access as a 'dry-weather four-wheel drive road'. In order to protect the road surface from vehicle use when wet, gates will be installed at the northern and southern ends of this section of Toonumbar Forest Road to allow for closure during periods of wet weather. When the road surface is sufficiently dry the gates will be reopened to public vehicular use. Signage will be provided to advise the public of any road closures and possible alternative routes.

Cox's Road (from the northern boundary of Toonumbar NP) and its continuation east along Toonumbar Forest Road, will remain open for public vehicular use to Sherwood Lookout. Sherwood Lookout provides some of the finest views in the planning area. East of Sherwood Lookout the Toonumbar Forest Road will be closed to public vehicles and be maintained as a management trail only. Poor road conditions and potential conflict with logging trucks make this section of Toonumbar Forest Road hazardous and prone to erosion. Signage will be installed on this section of the road to indicate these changes to access.

The Murray Scrub Management Trail between Coxs Road and Iron Pot Creek is no longer required for management purposes. This trail dissects the rainforest community within the Iron Pot Creek catchment. It is proposed to close and rehabilitate this trail as it is costly to maintain due to its natural earth surface, poor drainage and regular tree falls. This will improve the habitat values of this important area of rainforest (refer to *9. Management Facilities & Operations*). Public vehicle access to Iron Pot Creek day use and camping area continues to be provided by Murray Scrub Road via Afterlee Road from Kyogle.

Some park roads and trails are used by park neighbours to access their property. Formal arrangements between the NPWS and relevant neighbours may be required. Where access is obtained via a locked management trail, keys may be provided to neighbours.

Park roads and management trails link with adjoining roads managed by Kyogle Council and SFNSW. A Memorandum of Understanding is proposed between the NPWS and SFNSW regarding joint interest roads and trails to determine access arrangements and maintenance sharing. These include North Yabbra Road in Toonumbar NP, Peacock Creek Road in Richmond Range NP and Cherry Tree Road in Mallanganee NP (see figure 1). Negotiation with Kyogle Council is also required concerning the maintenance of joint interest roads.

Desired Outcomes

- ◆ Public vehicle access is provided on a park road network that is sustainable, protects park values and complements regional recreation opportunities.

- ◆ Adjoining public and state forest roads that link to park roads are managed in a coordinated manner with SFNSW and Kyogle Council .

Guidelines and Actions

- Public vehicle access will be provided on the park roads shown in figure 1. Park roads will generally be maintained to dry-weather two-wheel drive standard, with the exception of Afterlee Road (formerly Hamiltons and McNamaras Roads) in Richmond Range NP, Toonumbar Forest Road and North Yabbra Road in Toonumbar NP which will be to a dry-weather four wheel drive standard (refer to *6.7 Visitor Information*).
- Improve the park road and car park associated with the Murray Scrub walk in Toonumbar NP to a two-wheel drive standard.
- The Cambridge Plateau Forest Road and Afterlee Road (formerly Hamiltons and McNamaras Roads) in Richmond Range NP, and Toonumbar Forest Road (north of the Murray Scrub Road and south of the Cox's Road intersection) in Toonumbar NP, may be temporarily closed due to wet weather and road conditions so as to protect the road surface and ensure public safety. Such closure may necessitate the erection of gates. Upon closure, road users will be notified with "road closed" signs at park entry points. Roads will be reopened as soon as road conditions allow.
- Liaise with Kyogle Council regarding road maintenance for joint interest roads.
- Coordinate with SFNSW regarding management of joint interest roads and trails.
- Management trails will not be available for vehicle use by the general public and will have locked gates at entry points (refer to *9. Management Operations*).
- Access arrangements may be negotiated with relevant park neighbours requiring legitimate access to their property through management trails and park roads. Access will not be provided on any former road or trail proposed for permanent closure.
- A maximum speed limit of 40 kph will apply to all public motor vehicles using roads within the planning area. Support and cooperation from Kyogle Council will be sought where public roads in the park are involved.

6.2 DAY USE AND CAMPING AREAS

The planning area contains the following main visitor areas:

- Iron Pot Creek day use and camping area in Toonumbar NP;
- Peacock Creek day use and camping area in Richmond Range NP;
- Cambridge Plateau day use area in Richmond Range NP; and

- A roadside rest area on the Bruxner Highway in Mallanganee NP.

With the exception of Mallanganee NP, facilities at these areas are progressively being upgraded. This has included the replacement of pit toilets with composting systems and the installation of picnic facilities and interpretive signage. Some works are still to be completed at Cambridge Plateau and Peacock Creek in Richmond Range NP.

At Cambridge Plateau, improvements to the car park, walking tracks and picnic facilities are planned. Vegetation to the east of the day use area has been pruned in the past to enable views over the Richmond valley to the Nightcap and Tweed Ranges to the north east.

At Peacock Creek, it is proposed to remove the former forestry hut and shed due to their dilapidated condition. It is proposed to replace these structures with new visitor facilities.

The planning area also contains other small visitor areas that pre-existed park gazettal (refer to 6.3 *Bushwalking*). These areas receive little visitor use and are generally in poor condition. It is proposed to close the following areas in lieu of improvements to other visitor areas in the planning area and national parks located nearby:

1. **Toonumbar NP.** The Eden Creek Falls walking track and picnic area will be closed and the picnic facilities removed. The walking track at this location is in very poor condition and is hazardous. The falls area is considered too dangerous to promote as a public use area. Visitor use will be directed to the nearby Iron Pot Creek, Murray Scrub Lookout and Sherwood Lookout day use areas.
2. **Mallanganee NP.** The rest area on the Bruxner Highway will be closed due to the poor condition of facilities and ongoing vandalism and rubbish dumping. Visitors will be redirected to nearby recreation areas including Mallanganee lookout (1 km to the west) and Cambridge Plateau day use area in Richmond Range NP (12 km to the north).

Mallanganee Lookout adjoining Mallanganee NP is managed by Kyogle Council and the local progress association and is conveniently located off the Bruxner Highway. This vantage point allows views over Mallanganee NP and the Richmond River Valley through to Mt Warning. The NPWS has recently provided a one-off contribution to upgrade the visitor facilities at Mallanganee Lookout even though it is not within the park. Mallanganee Lookout now has two new covered tables a new pit toilet and new turf and fencing. An interpretive sign will also be provided at the lookout, this sign apart from providing local visitor information will also acknowledge the assistance provided by the Vietnam Veterans Association at the former Cherry Tree State Forest (refer to 6.7 *Visitor Information*).

The nearby Border Ranges NP provides complementary day use and camping areas. Toonumbar Dam, managed by the Department of Land and

Water Conservation, also provides complementary recreation facilities such as cabin accommodation, picnic and conference facilities and fresh water fishing (refer to 6.7 Visitor Information). Privately owned visitor accommodation is also provided at other locations surrounding the planning area.

Desired Outcomes

- ◆ Day use and camping areas are managed to provide a high quality visitor experience with minimum impact on park values.

Guidelines and Actions

- Manage day use and camping areas in accordance with the facility and capacity levels defined in the following table:

Table 2. Day Use & Camping Areas

	<i>Iron Pot Creek</i>	<i>Peacock Creek</i>	<i>Cambridge Plateau</i>	<i>Sherwood Lookout</i>	<i>Murray Scrub Lookout</i>
Classification / Facility type (max capacity)	Basic day use & camping area	Basic day use & camping area	Basic day use area	Basic day use area	Basic day use area
Picnic tables	8	6	3	2	0
Camp sites	24	12	0	0	0
Galley	2	1	0	0	0
Toilets	2	1	1	1	0
Interpretive sign / basic shelter	1	1	1	1	1
Walking track length	325 m	0	2.5 km	0	0
Car parking capacity	32	20	6	4	2

Note: Mallanganeer Lookout day use area is not included in table 2 because it is not on NPWS estate.

- Continue to prune vegetation to maintain the current extent of the view to the east of Cambridge Plateau day use area. Low growing vegetation is to be retained for soil stability.
- Remove redundant infrastructure and rehabilitate the following sites:
 - The rest area on the Bruxner Highway in Mallanganeer NP; and
 - Eden Creek Falls in Toonumbar NP.

- Remove the dilapidated shelter and shed at Peacock Creek in Richmond Range NP subject to a cultural heritage assessment. Replace with alternative visitor facilities in accordance with Table 2 above.

6.3 BUSHWALKING

Bushwalking is a relatively popular activity in the planning area. There are two main walking tracks: the 5.5 km Murray Scrub circuit in Toonumbar NP and the 2.5 km Culmaran valley track at Cambridge Plateau in Richmond Range NP. They provide easy to moderate grade walks through some of the World Heritage listed rainforests of the planning area. The Iron Pot Loop in Toonumbar NP also provides an easy grade short walk from the day use and camping areas to Iron Pot Creek. Management trails provide bushwalking opportunities at Peacock Creek day use and camping area in Richmond Range NP.

A rough walking track leads from the Bruxner Highway rest area in Mallanganee NP (refer to *6.2 Day Use & Camping Areas*). This track, constructed by the Korea South-East Asian Vietnam Veterans (Far North Coast) in the 1980s, is steep, receives little use, is overgrown and poorly defined.

Self-reliant bushwalking can be undertaken in many other areas of the planning area. Management trails also provide walking opportunities. Bushwalking opportunities are also available in nearby parks including Border Ranges NP.

Desired Outcomes

- ◆ Bushwalking opportunities are provided that are ecologically sustainable and complement other opportunities nearby.

Guidelines and Actions

- Maintain the existing walking tracks at the Murray Scrub and Iron Pot Creek in Toonumbar NP and at Cambridge Plateau in Richmond Range NP to a 'walking track' (AS class 3) track standard (Standards Australia, 2001).
- Close and rehabilitate the former walking track in Mallanganee NP (refer to *6.2 Day Use & Camping Areas*).
- Undertake a feasibility study of constructing a short (1 to 2 km) interpretive walking track opportunity to a 'walking track' (AS class 3) standard at Peacock Creek in Richmond Range NP. If considered feasible, and warranted because of potential public demand, an amendment will be required to this plan before construction can commence.

6.4 RECREATIONAL HORSE RIDING

Horse riding occurs occasionally on parts of the park road and management trail network, mostly within Richmond Range NP. Horse riding on roads and trails within the planning area is generally only part of a longer route, which typically includes adjoining state forest and public roads.

Overnight or organised horse riding activities such as club rides and endurance riding competitions in parks require NPWS consent. However, camping with horses in the planning area is not considered appropriate due to the lack of sites capable of sustaining this use. Horse riding is not permitted off-track, on walking tracks or former logging tracks that are to be closed and rehabilitated.

Recreational horse riding can be accommodated on designated park roads and management trails that have limited traffic, are strategically linked with adjoining off-park opportunities and in a condition that can sustain this use. Group activities or events such as endurance rides require prior written consent from the NPWS (refer to *6.6 Special Events & Commercial Tours*).

Desired Outcomes

- ◆ Opportunities for horse riding are provided on designated routes that are safe and sustainable and provide links to adjoining off-park riding opportunities.

Guidelines and Actions

- Horse riding may be conducted on all park roads and management trails located south of Backadun Road in Toonumbar NP and north of Peacock Creek Road in Richmond Range NP (see figure 1). Horses will not be permitted off these designated roads and trails.
- Signage will be provided on those roads and trails where horse riding is permitted.
- Overnight camping with horses and the erection of holding yards, hitching points, water troughs or other related infrastructure will not be permitted in the planning area.
- No importation of hay or other horse feed that will introduce weed seeds will be permitted into the planning area.
- Horse riding activities and numbers will be monitored for environmental effects and conflict with other park users. Conditions may be placed on horse riding activities if necessary to protect park values, visitor enjoyment (including that of horse riders) and public safety.

6.5 OTHER RECREATION ACTIVITIES

The planning area currently experiences low levels of use from cyclists. Adventure activities, such as rock climbing and abseiling, may occasionally occur in the planning area. Adventure activities will only be permitted where they are safe, have minimal conflict with other visitors and do not threaten the natural and cultural values of the planning area.

Desired Outcome

- ◆ Recreation activities are nature-based, safe and ecologically sustainable.

Guidelines and Actions

- Cycling may only be conducted on park roads and management trails shown in figure 1. Cycling is not permitted on roads and trails proposed for permanent closure or when roads are temporarily closed to public vehicles during wet weather (refer to section 6.1).
- Cycling activities and numbers on management trails will be monitored for environmental effects and conflict with other park users. Conditions may be placed on cycling activities if necessary to protect park values, visitor enjoyment (including that of cyclists) and public safety.
- No specific facilities or provision will be made for adventure activities such as rock climbing, abseiling or hang-gliding. All adventure activities will require consent from the NPWS.

6.6 SPECIAL EVENTS, GROUP ACTIVITIES & COMMERCIAL TOURS

Special events such as horse endurance rides are infrequently held in Toonumbar and Richmond Range NPs and require NPWS consent. In addition, any group activity involving more than 20 persons require prior written consent under NPWS regulations.

While there is currently a low level of commercial tours conducted in the planning area, some areas are considered suitable for small group tours using the main park roads and day use areas. Commercial operators need to be licensed and will be subject to conditions of operation.

Special events, group activities and commercial tours should be nature-based and facilitate understanding and appreciation of the natural and cultural heritage values of the planning area. Proposals are also assessed against the availability of more appropriate off-park venues, conflict with other visitors, visitor safety and potential impacts on park values. Licence conditions may be imposed regarding group size, supervision, transport type, activities permitted, equipment and monitoring.

Desired Outcome

- ◆ Special events, group activities and commercial tours are conducted under NPWS approval and are safe, sustainable, compatible with other visitor use and enhance visitor understanding of the planning area.

Guidelines and Actions

- Licences and consent for special events, group activities and commercial tours will only be issued for activities that are safe, ecologically sustainable, compatible with other visitor use and enhance visitor understanding of the planning area.

6.7 VISITOR INFORMATION

Visitor information is an important aspect of park management in that it enhances visitor experience while promoting appropriate use and ongoing support for the conservation of the planning area. Visitor information includes promotional, interpretive and advisory material. This information is typically provided through tourist information sources, park brochures, signage and enquiries with NPWS staff.

Promotion of the planning area needs to consider and communicate that many park roads and linking public roads are dry weather only and of variable condition (refer to *6.1 Public Vehicle Access*). Information on complementary recreation opportunities located nearby should also be provided. These include the Tweed Range Scenic Drive in Border Ranges NP, Toonumbar Dam adjacent to Richmond Range NP and Mallanganee Lookout adjoining Mallanganee NP (refer to *6.2 Day Use & Camping*). Information at park “gateway towns” such as Kyogle is also important.

The NPWS (Northern Rivers Region) participates in a number of industry based nature tourism organisations. The regional tourism industry have proposed a car touring route called the ‘Rainforest Way.’ An option for this route includes the Cambridge Plateau Forest Road in Richmond Range NP via Kyogle and Casino (refer to *6.1 Public Vehicle Access*). This may be promoted through publications when the route is finalised.

Interpretative opportunities are important to improve visitor understanding and appreciation of park values and contribute to visitor experience. Interpretive and promotional themes particularly relevant to the planning area include World Heritage values, local Aboriginal cultural values and the diversity of native plants and animals. These themes can be promoted and interpreted to visitors in a manner that protects these values and encourages appropriate use.

Interpretive signs are in place at the main day use and camping areas. They contain information on park values and the recreation opportunities provided at national parks in the region. Some of the information requires updating. An

interpretive sign is proposed for Mallanganee lookout adjoining Mallanganee NP (refer to *6.2 Day Use & Camping*).

Other park signage includes directional and other visitor information signs. Some former SFNSW signage requires replacing. Brochures are available for Toonumbar and Richmond Range NPs. These also require updating.

Desired Outcomes

- ◆ Visitors are generally aware of park values and recreation opportunities available.

Guidelines and Actions

- Park promotion will be 'low key' and focus on visitor opportunities at Iron Pot Creek and Murray Scrub in Toonumbar NP and Peacock Creek and Cambridge Plateau in Richmond Range NP (refer to *6.2 Day Use & Camping*).
- An interpretive sign will be provided at Mallanganee Lookout acknowledging past involvement and assistance provided by the local Vietnam Veterans Association.
- Promote education and interpretation themes associated with the World Heritage CERRA rainforests, local Aboriginal cultural values and diverse plant and animal communities.
- Interpret Aboriginal cultural values in consultation with representatives of the local Aboriginal people (refer to *4.4 Aboriginal Heritage*).
- Any park promotion is to include information regarding restrictions to vehicle access during wet weather and advice that road conditions are variable (refer to section 6.1 *Public Vehicle Access*).
- Update interpretive displays, park signage and park brochures to ensure consistency with this plan.

7. RESEARCH & MONITORING

Research on the natural and cultural values of the planning area, and processes that affect them, is essential for good management.

Service research efforts tend to be directed towards the areas of greatest need. Research by other agencies, universities and students may provide valuable information for management. There are a number of existing research projects being conducted in the planning area including research undertaken by the School of Resource Science and Management at Southern Cross University under a Memorandum of Understanding with the NPWS.

Research and monitoring projects require prior approval from the NPWS. Any research proposals need to be assessed and managed to ensure appropriate use and mutually beneficial outcomes.

The planning area provides research opportunities associated with its Aboriginal heritage values, the diversity of native plants and animals and post-logging forest succession.

Desired Outcomes

- ◆ Research conducted is compatible with park values and where possible, benefits park management.

Guidelines and Actions

- Prepare a research prospectus to encourage research and monitoring that will assist park management. Include the following research and monitoring topics:
 - The spatial extent and conservation state of World Heritage values (refer to *4.1 World Heritage*).
 - Identify threatened plant species along roads and trails to avoid inadvertent damage (refer to *4.3 Biodiversity*).
 - Identify significant vegetation communities, habitats and native plant and animal species (refer to *4.3 Biodiversity*).
 - Undertake surveys for the crayfish *Euastacus gumar* to determine its distribution, taking into account seasonality (refer to *4.3 Biodiversity*).
 - Monitor known populations of the endangered herb *Corchorus cunninghamii* (refer to *4.3 Biodiversity*).
 - Identify the distribution of noteworthy species such as brush-tailed rock wallaby and wombat.
 - Monitor the extent of bell miner-eucalypt dieback (refer to *4.3 Biodiversity*).

- Identify sites and/or places of significance to local Aboriginal people (refer to *4.4 Aboriginal Heritage*).
 - Identify and assess the significance of historic features (refer to *4.5 Historic Heritage*).
 - Identify the extent of hybridisation of plantation eucalypts with eucalypts in the planning area eg Cadaghi (*Corymbia torrelliana*) with Richmond Range spotted gum (*Corymbia variegata*) (refer to *5.3 Introduced Plants*).
 - Identify new occurrences of pest species (refer to *5.3 Introduced Plants, 5.4 Introduced Animals*).
 - Undertake a fire and biodiversity monitoring program.
 - Monitor the extent of natural regeneration on closed trails.
 - Collect information on visitor use, satisfaction and impact.
 - Monitor impacts associated with horse riding and cycling on designated roads and trails (refer to *6.4 Horse Riding and 6.5 Other Recreation Activities*)
- Continue to encourage research in accordance with the Memorandum of Understanding with Southern Cross University.
 - Ensure research and monitoring projects are of benefit to park management, conducted in accordance with best practices and results communicated to relevant NPWS staff.

8. OTHER USES

There are a number of non-park related land uses in the planning area, such as public utilities (including radio transmission towers and electricity transmission lines) and apiary use. There are also a number of crown reserve in-holdings including road reserves and travelling stock routes.

Many of these land uses were pre-existing to park gazettal and may be an 'existing interest' under Section 39 of the NP&W Act. Tenure arrangements need to be formalised under leases or licences to occupy or use land gazetted as national park.

There are two radio transmitter sites in the planning area. One transmitter is located in the north-east of Toonumbar NP. The other transmitter is located at Mt Babyl in Richmond Range NP. A transmission line is also located in the north-east of Toonumbar NP.

There are 41 bee site licences within the planning area that pre-exist park gazettal. Existing bee sites are managed in accordance with NPWS policy.

Former tick fencing is located along parts of the Richmond Range. NSW Agriculture has advised that there is no further need to maintain this fence. The remaining barbed wire strands can hamper fire fighting and have been known to injure or kill wildlife.

Desired Outcomes

- ◆ Existing non-park related uses are managed to have minimal impact.

Guidelines and Actions

- Prepare lease or license agreements for existing radio transmitter sites in Toonumbar NP and at Mt Babyl in Richmond Range NP.
- Continue to permit the existing commercial beekeeping operations in accordance with NPWS policy and licence conditions. No new bee licences will be issued in the planning area.
- Remove the wire from the former tick fences in Richmond Range and Mallanganee NPs, except where the fence forms part of a park boundary. Record the tick fences before removal and leave the posts in situ.
- Seek revocation of the crown reserve in-holdings in Richmond Range NP and Hogarth Range NR and incorporate within the park.

9. MANAGEMENT FACILITIES AND OPERATIONS

The planning area is managed by the Northern Rivers Region of the NPWS under the Kyogle operational area. The Kyogle operational area has an office and depot located at Kyogle and a depot also located at Urbenville.

A small gravel quarry located off the Cambridge Plateau Forest Road is used for park road works in Richmond Range NP. An environmental assessment has been approved for the continuing use of this quarry for park road works subject to consent conditions to protect the surrounding environment. A quarry managed by SFNSW is also located adjacent to the planning area at the intersection of Short Cut and Toonumbar Forest Management Trails.

Some park boundaries are difficult to locate on site, particularly in Richmond Range and Toonumbar NPs. Permanent marking of some key park boundary points would help avoid incursions from adjoining land uses and provide useful reference points, particularly during fire fighting operations.

Locked gates need to be installed on management trails to prevent unauthorised vehicle access and trail damage. Unauthorised use in the past, especially during wet conditions, has led to trail damage, erosion and siltation of adjoining waterways. Furthermore, despite many of these trails being signed as a 'dry weather trail only,' there have been numerous incidents of visitor vehicles becoming bogged on these trails requiring costly vehicle recovery and trail repair.

There are many unformed tracks that remain from former logging operations which were not intended or promoted for recreation use. Many are in poor condition, overgrown and not required for ongoing management purposes. The rehabilitation of these tracks is important to minimise erosion and improve habitat.

Desired Outcomes

- ◆ The quarry in Richmond Range NP is managed with minimum impact on park values.
- ◆ Park boundaries are easily located at key locations on-site.
- ◆ The management trail network is adequate for management purposes.

Guidelines and Actions

- Continue to utilise the existing gravel quarry on Cambridge Plateau Forest Road in Richmond Range NP in accordance with consent conditions and Department of Mineral Resources' requirements.
- Install park boundary marker posts with Australian Map Grid information in key locations adjacent to roads and trails.

- Retain the management trail network in accordance with figure 1 (refer to *5.5 Fire Management*). Maintain management trails to a dry weather four-wheel drive accessible standard. Install locked gates on management trails where necessary. Provide keys to relevant park neighbours in accordance with access agreements (refer to *6.1 Public Vehicle Access*).
- Restrict management access to the Bungdoozle Trail network to essential management and emergency operations only.
- Maintain park roads, management trails and walking tracks so as to comply with appropriate NPWS standards (refer to *6.1 Public Vehicle Access*; *6.3 Bushwalking*).
- Progressively close and rehabilitate former logging tracks no longer required.

10. PLAN IMPLEMENTATION

This plan of management is part of a system of management developed by the NPWS. The system includes the NP&W 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, fire management plans and conservation plans.

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

Implementation of this plan will be undertaken within the annual programs of the NPWS Northern Rivers Region. The actions identified in the plan are those to which priority will be given in the foreseeable future. Other management actions may be developed consistent with the desired outcomes, guidelines and actions of the plan.

Relative priorities for identified activities are set out in the table below (Table 3). 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.

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

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

Desired Outcomes

- ◆ The plan is implemented in accordance with identified priorities.

Guidelines and Actions

- Undertake an annual review of progress in implementing this plan.
- Undertake an assessment every 5 years of the effectiveness of managing the planning area in accordance with this plan and of the degree of success in achieving the plan's desired outcomes.

Table 3. Implementation Table for Actions

SECTION	ACTION	PRIORITY
4.1 WORLD HERITAGE	* Facilitate research, training and interpretive programs regarding World Heritage values.	Medium
4.2 LANDFORMS & SCENIC LANDSCAPES	<i>Guidelines Only</i>	<i>N/A</i>
4.3 BIODIVERSITY	* Undertake weed control and restoration works to protect the endangered <i>Rapanea</i> species A. Prepare and implement a road maintenance strategy for roadside populations.	High
	* Undertake weed control and restoration works for known Richmond Birdwing Butterfly habitat areas.	High
	* Undertake rare plant surveys along roads, trails and tracks where required.	High
	* Implement a marker system throughout the road and trail network to protect threatened plants.	High
	* Monitor populations of the endangered native jute <i>Corchorus cunninghamii</i> .	High
	* Assess vegetation communities, habitats and species considered significant and revise management practices.	Medium
	* Research strategies to control eucalypt dieback.	High
4.4 ABORIGINAL HERITAGE	* Prepare a management agreement with representatives of the Aboriginal community.	High
	* Progressively record all Aboriginal sites and update the Aboriginal Heritage Information Management System.	High
4.5 HISTORIC HERITAGE	* Develop management strategies to protect blazed trees in Toonumbar and Mallanganee NPs.	Medium
	* Interpret former management of visitor use areas	Low
5.1 SOIL CONSERVATION	* Rehabilitate disturbed areas such as former log dumps.	High
5.2 WATER CATCHMENT	<i>Guidelines Only</i>	<i>N/A</i>
5.3 INTRODUCED PLANTS	* Implement the Rehabilitation and Restoration Plan for Mallanganee NP.	High
	* Prepare and implement Restoration and Rehabilitation Plans for Richmond Range and Toonumbar NPs and Hogarth Range NR.	High
	* Continue control programs for groundsel bush and giant Parramatta grass in Toonumbar and Richmond Range NPs.	High
	* Interpret the lantana control plots	High
	* Assess the restoration requirements for the two plantation areas on North Yabbara Road in Toonumbar NP and undertake any restoration works necessary.	Low

SECTION	ACTION	PRIORITY
5.4 INTRODUCED ANIMALS	* Prepare pest animal management plan(s).	High
	* Implement the Fox Threat Abatement Plan.	High
	* Continue to cooperate with neighbours to ensure adequate boundary fencing	High
	* Assist in the preparation and implementation of a wild dog management plan.	High
5.5 FIRE MANAGEMENT	* Prepare a Fire Management Plan for the area.	High
	* Involve representatives of local Aboriginal people in the preparation of Fire Management Plans.	High
6.1 PUBLIC VEHICLE ACCESS	* Maintain park roads to dry-weather two-wheel drive standard, with the exception of Afterlee Road, Toonumbar Forest Road and North Yabbra Road.	High
	* Improve the park road and carpark at the Murray Scrub walk in Toonumbar NP to a two-wheel drive standard.	Medium
	* Negotiate access arrangements with relevant park neighbours.	High
	* Implement and seek support from Council for 40kph speed limits	Medium
6.2 DAY USE AND CAMPING AREAS	* Manage day use and camping areas in accordance with Table 2.	High
	* Negotiate with the Kyogle Council and Mallanganee Progress Association for the NPWS to provide a one-off refurbishment of the Mallanganee lookout adjoining Mallanganee NP.	High
	* Remove dilapidated facilities at Peacock Creek and replace with alternative visitor facilities.	Low
	* Remove redundant infrastructure and rehabilitate rest stops and lookouts not to be retained.	Low
6.3 BUSHWALKING	* Maintain existing walking tracks to a AS3 standard.	Medium
	* Close and rehabilitate the former walking track in Mallanganee NP.	Low
	* Assess feasibility of constructing a short interpretive walking track at Peacock Creek.	Low
6.4 HORSE RIDING	* Install signs to indicate roads and trails available for horse riding.	Medium
	* Horse riding activities and numbers will be monitored for environmental effects and conflict with other park users.	Medium
6.5 OTHER RECREATION ETC.	Cycling activities and numbers on management trails will be monitored for environmental effects and conflict with other park users.	Medium
6.6 SPECIAL EVENTS ETC.	<i>Guidelines only.</i>	N/A

SECTION	ACTION	PRIORITY
6.7 VISITOR INFORMATION	* Update displays, park signage and park brochures	High
	* Provide interpretive sign at Mallanganee Lookout acknowledging past involvement and assistance provided by the local Vietnam Veterans Association	Medium
7. RESEARCH & MONITORING	* Prepare a research prospectus.	Low
8. OTHER USES	* Prepare lease or license agreements for radio transmitter sites in Richmond Range NP and Toonumbar NP.	High
	* Record and remove wire from former internal 'tick fences' in Richmond Range and Mallanganee NPs.	Low
	* Seek closure of the crown reserve in-holdings in Richmond Range NP and Hogarth Range NR and incorporate within the park.	Low
9. MANAGEMENT FACILITIES AND OPERATIONS	* Install park boundary marker posts in key locations.	Low
	* Maintain management trails to a dry weather four-wheel drive standard and install locked gates.	High
	* Restrict management access to the Bungdoozle Trail network to essential management and emergency operations only.	High
	* Progressively close and rehabilitate former logging tracks no longer required.	Medium

REFERENCES

- Blackmore & Associates (1993) *European Heritage: Historical Report. Northern Region SFNSW. Casino Management Area EIS & Murwillumbah Management Area EIS. Supporting Document No. 4. SFNSW.*
- Bradstock, R.A., Keith, D.A. & Auld, T.D. "Fire and conservation: imperatives and constraints on managing diversity" in Bradstock, R.A. et al (1995) *Conserving Biodiversity: threats and solutions.* Surrey Beatty and Sons, Sydney.
- CERRA (2000) *World Heritage Central Eastern Rainforest Reserves of Australia: Strategic Overview for Management,* Department of Environment and Heritage, Canberra.
- Coghran, J. (2000) *The Distribution, Habitat and Conservation Status of Euastacus gumar (Decapoda: Parastacidae), in North Eastern New South Wales.* Honours Thesis (Unpublished). Southern Cross University.
- Collins, J.P. (December 1991) *Report on the Archaeological Survey of The Duck Creek Environmental Impact Statement Area, Northern NSW.* Forestry Commission of NSW.
- Commonwealth of Australia (March, 2001) *Regional Forest Agreement for North East New South Wales (Upper North East and Lower North East Regions) between The Commonwealth of Australia and the State of New South Wales*
- Coughran, J., 2002. *A New Species of the Freshwater Crayfish Genus Euastacus (Decapoda: Parastacidae) from Northeastern NSW, Australia.* Records of the Australian Museum (2002) Vol 54: 25-30. ISSN 0067-1975.
- Floyd, A. (1980) *Rainforests of the Richmond Range.* NPWS unpublished report.
- Hunter, R.J. (1999) *World Heritage Values and Attributes and Associative Natural Values of the Central Eastern Rainforest Reserves of Australia.* Unpublished draft report to Environment Australia.
- IUCN (1994) Guidelines for Protected Area Management. International Union for the Conservation of Nature and Natural Resources.
- ICOMOS (1992) The Australian ICOMOS Charter for the Conservation of Places of Cultural Significance (The Burra Charter). Australia ICOMOS (International Council on Monuments and Sites).
- NPWS (1988), Field Management Policies, NPWS (regularly updated).
- NPWS (1999), NSW Biodiversity Strategy, NPWS.
- NPWS (2003) *Recreation Planning Framework for NSW National Parks,* draft report prepared by the Northern Directorate of NPWS
- SFNSW (11 August 1982) Boundary Marking – Proposed Mallanganee Flora Reserve. Memorandum from Regional Forester, Casino.
- SFNSW (1986) Management Plan for the Urbenville Management Area. Forestry Commission of NSW.

SFNSW (1995) *Proposed Forestry Operations in the Urbenville Management Area EIS*. Forestry Commission of New South Wales

Smith, Clare (July 1993) Urbenville Management Area EIS: Supporting Document No. 5. An Archaeological investigation of the Urbenville Management Area, North Eastern NSW. SFNSW.

Standards Australia (2001) *Australian Standard - Walking Tracks, AS 2156.1 – 2001*.

Appendix 1. World Heritage CERRA values

The CERRA was inscribed on the World Heritage List in 1986 and was subsequently expanded and re-inscribed in 1994. The World Heritage criteria current in 1994 and against which the CERRA was listed remain the formal criteria for this property. These criteria have been included in the Values Table below. The World Heritage criteria are periodically revised and the criteria against which the property was listed in 1994 are not necessarily identical with the current criteria.

Examples of the World Heritage values for which the CERRA was listed are included in the Values Table for each criterion. These examples are illustrative of the World Heritage values of the property, and they do not necessarily constitute a comprehensive list of these values. Some of these values do not apply to the planning area but are relevant to other parts of CERRA. Further information can be obtained from Hunter (1999).

Natural criteria against which the Central Eastern Rainforest Reserves (Australia) (CERRA) was inscribed on the World Heritage List in 1994.	Examples of World Heritage values of the CERRA.
<p>Criterion (i) outstanding examples representing the major stages of the earth's evolutionary history.</p>	<p>The CERRA preserve outstanding examples of ecosystems and taxa from which modern biota are derived, including: some of the oldest elements of the world's ferns from the Carboniferous period; one of the most significant centres of survival for Araucarians; an outstanding record of Angiosperms; an outstanding number of the oldest lineages of the <i>Corvida</i> (one of the two major groups of true songbirds that evolved in the Late Cretaceous); and outstanding examples of other relict vertebrate and invertebrate fauna from ancient lineages linked to the break-up of Gondwana. The World Heritage values include:</p> <ul style="list-style-type: none"> • rainforests which are exceptionally rich in primitive and relict species, many of which are similar to fossils from Gondwana; • subtropical rainforest habitat; • warm temperate rainforest habitat; • ancient ferns and tree ferns; • conifers (e.g. hoop pine) and cycads; • primitive plant groups within Magnoliales and Laurales (e.g. the <i>Trimenia</i>, <i>Wilkiea</i>, <i>Cryptocarya</i>, <i>Litsea</i> genera); • primitive plant groups in the <i>Rosidae</i> and <i>Dilleniidae</i> genera (e.g. coachwood, Antarctic Beech, <i>Eucryphia jinksii</i>, turnipwood, pittosporum, most common in warm temperate and subtropical rainforest types); • primitive animal group of Corvida (such as lyrebirds, rufous scrub-bird, bowerbirds and tree-creepers); • other birds dating from Gondwana (e.g. logrunner, thornbills, scrubwrens and gerygones); • frogs in the families Myobatrachidae and Hylidae; • reptiles such as chelid turtles and leaf-tailed gecko; • monotremes and marsupials; and • invertebrate fauna with origins in Gondwana, including fresh-water crays, land snails, velvet worms, mygalomorph spiders, flightless carabid beetles, bird-wing butterfly and glow-worms. • ecosystems and taxa which demonstrate the origins and rise to dominance of cold-adapted/dry-adapted flora, including: <ul style="list-style-type: none"> - cool temperate rainforest habitat; - dry rainforest habitat; and - plant species in the families Myrtaceae, Casuarinaceae and Proteaceae.

<p>Criterion (ii) outstanding examples representing significant ongoing geological processes, biological evolution and man's interaction with his natural environment.</p>	<p>The CERRA provides outstanding examples of ongoing geological processes associated with Tertiary volcanic activity and of biological evolution. The World Heritage values include:</p> <ul style="list-style-type: none"> • the caldera of the Tweed Shield Volcano is considered one of the best preserved erosion caldera in the world and is notable for its size, its age (20 million years), and for the presence of a prominent central mountain mass with all three stages of the erosion of shield volcanoes (the planeze, residual and skeletal stages); • centres of endemism where ongoing evolution is taking place; • flora and fauna of low dispersal capability that occur in more than one isolated pocket of the CERRA; • plant taxa that show evidence of relatively recent evolution, including: <ul style="list-style-type: none"> - genera in Southern Hemisphere families (e.g. Winteraceae, Monimiaceae and Lauraceae in the Magnolidae, Proteaceae, Cunoniaceae, Euphorbiaceae, Escalloniaceae, Davidsoniaceae Pittosporaceae, Myrtaceae and Sapindaceae in the Rosidae and, Elaeocarpaceae, Sterculiaceae and Ebenaceae in the Dilleniidae); and - monotypic endemic families (e.g. Akaniaceae and Petermanniaceae); • animal taxa that show evidence of relatively recent evolution, including: <ul style="list-style-type: none"> - 3 species of frogs in the Myobatrachid genus <i>Pseudophryne</i> believed to have diverged in the Pliocene; - species of frogs in the relict genus <i>Philoria/ Kyarranus</i> and the <i>Litoria pearsoniana/ phyllochroa</i> complex; - reptiles such as <i>Eulamprus</i> spp; and - invertebrates such as snails, earthworms, crays, velvet worms and carabid beetles, including taxa that show overlap and intergradation of different faunal elements (e.g. ants and dung beetles); and • the diversity of plant and animal species.
<p>Criterion (iv) contain the most important and significant habitats where threatened species of plants and animals of outstanding universal value from the point of view of science and conservation still survive.</p>	<p>The ecosystems of the CERRA contain significant and important natural habitats, species of conservation significance, particularly associated with rainforest which once covered much of the continent of Australia and is now restricted to archipelagos of small areas of rainforest isolated largely by sclerophyll vegetation and cleared land. The World Heritage values include:</p> <ul style="list-style-type: none"> • habitats associated with: <ul style="list-style-type: none"> - subtropical rainforest; - wet sclerophyll forest; - montane heathlands; - rocky outcrops; and - ecotones between rainforest and sclerophyll communities; • plant taxa of conservation significance (more than 200 plant taxa, particularly in the families Proteaceae, Myrtaceae and Euphorbiaceae and including species of <i>Cryptocarya</i>, <i>Tasmannia</i> and <i>Endiandra</i>); • species of vertebrate fauna of conservation significance (including at least 80 taxa such as Albert's lyrebird, rufous scrub-bird, marbled frogmouth, eastern bristlebird, black-breasted button quail, <i>Philoria/ Kyarranus</i> spp., pouched frog, barred frogs, parma wallaby, yellow-bellied glider, Hastings River mouse, New Holland mouse, fawn-footed melomys and golden-tipped bat); and • species of invertebrate fauna of conservation significance (such as the Richmond River bird-wing butterfly and <i>Euastacus jagara</i>).

Appendix 2. Vegetation communities of the planning area.

Vegetation Type	Site Conditions	Vegetation Structure	Threatened & Noteworthy species	Examples of sites
Subtropical rainforest dominated by white booyong <i>Argyrodendron trifoliatum</i> .	Restricted to cool & moist sheltered southern slopes on fertile sites of basalt derived soils in areas of moderate rainfall.	Palms, trees with trunk buttressing, woody vines and large epiphytes, rich in non-vascular plants.	<p>Fauna: Bird species such as the vulnerable sooty owl <i>Tyto tenebricosa</i>, white-eared monarch <i>Monarcha leucotis</i>, Albert's Lyrebird <i>Menura alberti</i> and the barred cuckoo-shrike <i>Coracina lineata</i>, Coxen's fig-parrot <i>Cyclopsitta diophthalma coxeni</i>. Also provides essential habitat for fruit eating rainforest pigeons and other animals such as the wompoo fruit-dove <i>Ptilinopus magnificus</i>, rose-crowned fruit-dove <i>Ptilinopus regina</i> and the superb fruit-dove <i>Ptilinopus superbus</i>. Mammal species include spotted-tailed quoll <i>Dasyurus maculatus</i>, red-legged pademelon <i>Thylogale stigmatica</i>. The largest known population of the vulnerable Golden-tipped bat <i>Kerivoula papuensis</i> is found in Richmond Range NP. Other bat species include the little bent-wing bat <i>Miniopterus australis</i> and the common bent-wing bat <i>Miniopterus schreibersii</i>. Reptiles and amphibians include: the reticulated skink <i>Coeranoscincus reticulatus</i>, Stephen's banded snake <i>Hoplocephalus stephensii</i>, Fleay's barred frog <i>Mixophyes fleayi</i> and pouched frog <i>Assa darlingtoni</i>. Recent taxonomic investigations have identified <i>Philoria</i> sp. 3 as being restricted to the Richmond and the Yabbara range. The freshwater crayfish <i>Euastacus gumar</i> is confined to this range.</p> <p>Flora: Vulnerable flora include climbers such as <i>Clematis fawcettii</i>, arrow-head vine <i>Tinospora tinosporoides</i>, five-leaf Bosistoa <i>Bosistoa floydii</i> and ripple leaf muttonwood <i>Rapanea</i> sp.A. Contains good stands of red cedar <i>Toona ciliata</i>, and good specimen trees of rosewood, white and black booyong and white beech.</p>	<p>Three notable areas. The best example is in the head of Sandy Creek on Bungdoozle Plateau in Richmond Range NP which is reputed to have the highest diversity of flora in the planning area.</p> <p>The head of Upper Duck Creek on the southern fall of Dome Mtn in Toonumbar NP where it is dominated by white booyong above 600 m alt. & flooded gum below 500 m alt.</p> <p>There is also a dense understory of bangalow palms and cabbage tree palms in the Dome Mountain area.</p> <p>Also in this park it occurs along Iron Pot and Eden Creeks with the Murray Scrub area being relatively un-logged.</p>

Vegetation Type	Site Conditions	Vegetation Structure	Threatened & Noteworthy species	Examples of sites
Dry rainforest dominated by hoop pine <i>Araucaria cunninghamii</i> .	Dry western and northern relatively steep slopes on basaltic chocolate soils with infrequent fire with low rainfall. Occurs on the margins of subtropical rainforest and sclerophyll forests.	Structurally and floristically similar to subtropical rainforest.	<p>Fauna: white-eared monarch <i>Monarcha leucotis</i>, wompoo fruit-dove <i>Ptilinopus magnificus</i>, rose-crowned fruit-dove <i>Ptilinopus regina</i>, powerful owl <i>Ninox strenua</i>, sooty owl <i>Tyto tenebricosa</i>, Coxen's fig-parrot <i>Cyclopsitta diophthalma coxeni</i>, common planigale <i>Planigale maculata</i>, spotted-tailed quoll <i>Dasyurus maculatus</i>, black-striped wallaby <i>Macropus dorsalis</i>, black flying fox <i>Pteropus alecto</i>, grey-headed flying fox <i>Pteropus poliocephalus</i></p> <p>Flora: onion cedar <i>Owenia cepiodora</i>, Tinospora vine <i>Tinospora smilacina</i>. Well developed stands of hoop pine <i>Araucaria cunninghamii</i> and numerous native figs including <i>Ficus macrophylla</i>, <i>F. superba</i>, <i>F. coronata</i> and <i>F. watkinsiana</i>.</p>	Dominated by hoop pine <i>Araucaria cunninghamii</i> at O'Donnell Creek in Toonumbar NP, Mt Tryney and Gorge Creek in Richmond Range NP and in the north of Mallanganee NP. Dominated by lacebark <i>Brachychiton discolor</i> in the more sheltered southern slopes in the north of Mallanganee NP.
Wet forest dominated by brush box <i>Lophostemon confertus</i> , flooded gum <i>Eucalyptus grandis</i> and tallowwood <i>E.microcorys</i> .	Moist areas on both fertile basalt and poorer rhyolite soils at low to mid elevations (to 800 m elevation). Adjoins subtropical rainforest and dry rainforest.	Palms and small rainforest trees and shrubs dominate the understorey. Common lantana <i>Lantana camara</i> is also highly invasive of this understorey.	<p>Fauna: red goshawk <i>Erythrorhynchus radiatus</i> (endangered), sooty owl <i>Tyto tenebricosa</i> and the masked owl <i>Tyto novaehollandiae</i>, yellow-bellied glider <i>Petaurus australis</i>, Albert's lyrebird <i>Menura alberti</i>, koala, long-nosed potoroo and Parma wallaby. Other interesting species include the small-eyed snake <i>Cryptophis nigrescens</i> and numerous red-necked pademelon <i>Thylogale thetis</i>.</p> <p>Flora: Dunn's white gum <i>Eucalyptus dunnii</i>, ripple-leaf muttonwood <i>Rapanea sp. A</i>, slender Marsdenia vine <i>Marsdenia longiloba</i> and the herb cocksbur flower <i>Plectranthus nitidus</i>.</p>	Notable old grow forests of flooded gum and tallowood occur in the Eden Creek catchment, Upper Duck Creek to the south of Dome Mountain and the Iron Pot creek catchment. Significant stands of Dunnes white gum occur in the upper Peacock Creek and the Boomi Creek catchments.
Perched swamp with <i>Phragmites australis</i> & <i>Bolboschoenus fluviatilis</i> .	Swampy depressions in rainforest.		Fauna: species include the rough-scaled snake <i>Tropidechis carinatus</i> and great barred frog <i>Mixophyes fasciolatus</i>	Several hectares occur in rainforest in the vicinity of Dome Mtn.

Vegetation Type	Site Conditions	Vegetation Structure	Threatened & Noteworthy species	Examples of sites
Dry sclerophyll open forest and woodland dominated by eucalypts.	Drier, less fertile sites with a history of fire.	Dominated by eucalypts in the canopy with an acacia/ she-oak understorey.	<p>Fauna: Species listed as vulnerable include the masked owl <i>Tyto novaehollandiae</i>, powerful owl <i>Ninox strenua</i>, Mammals include the yellow-bellied glider <i>Petaurus australis</i> and koala <i>Phascolarctos cinereus</i>, eastern cave bat <i>Vespadelus troughtoni</i>, rufous bettong <i>Aepyprymnus rufescens</i>, brush-tailed phascogale <i>Phascogale tapoatafa</i>, squirrel glider <i>Petaurus norfolcensis</i>, brush-tailed rock-wallaby <i>Petrogale penicillata</i>, common planigale <i>Planigale maculata</i>, great barred frog <i>Mixophyes fasciolatus</i>. The common wombat <i>Vombatus ursinus</i> has been recorded from Richmond Range NP.</p> <p>Flora: native jute <i>Corchorus cunninghami</i>, <i>Marsdenia longiloba</i>.</p>	Dominated by Richmond Range spotted gum <i>Corymbia variegata</i> in Richmond Range NP.
Sub-montane heath.	Exposed areas of mid to high elevation with low soil fertility.		Contains <i>Chinochloa pallida</i> – <i>Pultenaea</i> which has a restricted distribution.	Edinburgh Castle.

Appendix 3. Threatened fauna recorded in the planning area.

SCIENTIFIC NAME	COMMON NAME	RECORDS	STATUS	PARK NAME
			E- Endangered V – Vulnerable	
<i>Coeranoscincus reticulatus</i>	Reticulated Skink	12	V	Toonumbar
		1		Richmond Range
<i>Hoplocephalus stephensii</i>	Stephen's Banded Snake	2	V	Toonumbar
		4		Richmond Range
<i>Philoria loveridgei</i>	Loveridge's Frog	3	V	Toonumbar
		3		Richmond Range
<i>Assa darlingtoni</i>	Pouched Frog	1	V	Richmond Range
<i>Litoria brevipalmata</i>	Green Thighed Frog	1	V	Toonumbar
<i>Mixophyes iteratus</i>	Giant Barred Frog	3	E	Richmond Range
<i>Burhinus grallarius</i>	Bush Stone-curlew	1	E	Toonumbar
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	1	V	Toonumbar
		3		Richmond Range
		2		Mallangane
<i>Coracina lineata</i>	Barred Cuckoo-shrike	3	V	Toonumbar
		2		Richmond Range
		6		Mallangane
<i>Cyclopsitta diophthalma</i>	Double-eyed Fig-Parrot	2	E	Toonumbar
		1		Richmond Range
<i>Menura alberti</i>	Albert's Lyrebird	18	V	Toonumbar
<i>Monarcha leucotis</i>	White-eared Monarch	6	V	Toonumbar
		1		Mallangane
<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove	47	V	Toonumbar
		57		Richmond Range
		8		Mallangane
<i>Ptilinopus regina</i>	Rose-crowned Fruit-Dove	14	V	Toonumbar
		9		Richmond Range
		2		Mallangane
<i>Ptilinopus superbus</i>	Superb Fruit-Dove	1	V	Toonumbar
		3		Richmond Range
		1		Mallangane
<i>Tyto novaehollandiae</i>	Masked Owl	1	V	Toonumbar
		6		Richmond Range
<i>Tyto tenebricosa</i>	Sooty Owl	9	V	Toonumbar
		22		Richmond Range
		1		Mallangane
<i>Ninox strenua</i>	Powerful Owl	2	V	Toonumbar
		9		Richmond Range
<i>Podargus ocellatus</i>	Marbled Frogmouth	1	V	Mallangane
		14		Toonumbar
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	3	V	Richmond Range
		1		Mallangane
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	1	V	Toonumbar
		3		Richmond Range
<i>Phascolarctos cinereus</i>	Koala	15	V	Toonumbar
		21		Richmond Range
<i>Aepyprymnus rufescens</i>	Rufous Bettong	2	V	Mallangane
		11		Toonumbar
		9		Richmond Range

SCIENTIFIC NAME	COMMON NAME	RECORDS	STATUS	PARK NAME
			E- Endangered V – Vulnerable	
<i>Macropus dorsalis</i>	Black-striped Wallaby	1	E	Toonumbar
		2		Richmond Range
		1		Mallanganee
<i>Macropus parma</i>	Parma Wallaby	3	V	Richmond Range
<i>Potorous tridactylus</i>	Long-nosed Potoroo	2	V	Richmond Range
<i>Petaurus australis</i>	Yellow-bellied Glider	5	V	Toonumbar
		26		Richmond Range
		2		Mallanganee
<i>Thylogale stigmatica</i>	Red-legged Pademelon	4	V	Toonumbar
		10		Richmond Range
<i>Vespadelus troungtoni</i>	Eastern Cave Bat	1	V	Richmond Range
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	2	V	Toonumbar
		1		Richmond Range
<i>Kerivoula papuensis</i>	Golden-tipped Bat	1	V	Toonumbar
		9		Richmond Range
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	1	V	Toonumbar
		2		Richmond Range
<i>Miniopterus australis</i>	Little Bent-wing Bat	1	V	Toonumbar
		14		Richmond Range
				Mallanganee
<i>Miniopterus schreibersii</i>	Common Bent-wing Bat	29	V	Richmond Range
<i>Myotis adversus</i>	Large-footed Myotis	1	V	Toonumbar
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	1	V	Richmond Range

Appendix 4. Threatened flora recorded in the planning area.

SCIENTIFIC NAME	COMMON NAME	RECORDS	STATUS	PARK NAME
<i>Clematis fawcettii</i>	northern clematis	4	V	Richmond Range
				Toonumbar
<i>Corchorus cunninghamii</i>	native jute	1	E	Toonumbar
<i>Marsdenia longiloba</i>	slender Marsdenia vine	1	E	Toonumbar
<i>Plectranthus nitidus</i>	cockspur flower	1	E	Richmond Range
<i>Owenia cepiodora</i>	onion cedar		V	Mallanganee
<i>Eucalyptus dunnii</i>	Dunn's white gum		V	Richmond Range
				Toonumbar
<i>Bosistoa floydii</i>	five-leaved Bosistoa			Richmond Range
<i>Senna acclinis</i>	senna			Mallanganee
<i>Tinospora smilacina</i>	Tinospora vine	2	E	Mallanganee
<i>Rapanea sp. A "Myrsine richmondii"</i> ms Betsy Jackson	ripple-leaf muttonwood	N/A	E	Richmond Range
<i>Tinospora tinosporoides</i>	arrow-head vine	1	V	Toonumbar

Appendix 5. Historic Resources of the Planning Area.

Park/ Reserve	Site	State Heritage Index No.	Description	Significance
Toonumbar NP	Edinburgh Castle	3911994	Prominent volcanic plug.	N/A
Toonumbar NP	Toonumbar Fire Tower	3913606	N/A	N/A
Toonumbar NP	blazed tree stump	N/A	blazed tree stump near the Toonumbar fire tower containing the letters 'E,' 'I'(SFNSW, 1995).	N/A
Richmond Range NP	Mount Brown	3912016	Dry and subtropical rainforest area on a basalt cap. Important Dreamtime place for the people of the Bundjalung Nation.	N/A
Richmond Range NP	Richmond Range Blockade Sites	3912007	Two blockade sites (former compartments 313 and 307/ 311) used to protest logging of old growth forest.	Assessed to be of regional social significance due to the protests directly leading to the establishment of the North East Harvest Advisory Board that established a community consultation process concerning logging.
Richmond Range NP	Richmond Range NP	3913567	Park containing gravel road through a variety of forest types.	N/A
Richmond Range NP	Richmond Range (Bruxner Highway to Toonumbar)	3911997	Large diversity of forest types	N/A

Park/ Reserve	Site	State Heritage Index No.	Description	Significance
Richmond Range NP & Mallangane NP	Richmond Range ridge line	N/A	Former cattle tick quarantine fence along the Richmond Range including sections along the Cambridge Plateau Forest Road and Cherry Tree Road.	N/A
Mallangane NP	Former Mallangane Flora Reserve and Cherry Tree Road	3912003	Former Flora Reserve contains best example of dry rainforest in NSW. Contains Lacebark <i>Brachychiton discolor</i> after which the former Cherry Tree SF was named. Contains part of Cherry Tree Forest Road that is associated with the adjoining Old Lawrence Road, the likely original route between Tenterfield and the Clarence River before the construction of the Bruxner Highway. Mallangane Lookout off-park also part of this listing.	Regional social significance due to widely known landmarks.
Mallangane NP	Former tick inspector house site	N/A	Former house site in the north-west corner of the park near the Mallangane Lookout off the Bruxner Highway.	N/A
Mallangane NP	Boundaries of former Mallangane Flora Reserves	N/A	Shield trees marking the boundaries of the former Mallangane Flora Reserve (SFNSW, 1982a).	N/A

Appendix 6. Acceptable Fire Thresholds for Plant Groups

Plant Community	Threshold
Rainforest	No fire acceptable
Wet Sclerophyll forest	Species decline expected if successive fires, of any intensity, occur less than 50 years apart. Species decline predicted if no fire for more than 200 years.
Dry Forest complex	Species decline expected if more than two successive fires occur at intervals of less than 5 years. Species decline expected if there are no fires for more than 30 years. Species decline expected if successive fires occur which totally scorch or consume the tree canopy.
Shrubland/heath complex	Species decline expected if more than two successive fires occur at intervals of less than 8 years. Species decline expected if more than two successive fires occur at intervals of more than 15 years. Species decline expected if no fire occurs for more than 30 years.
Grassland/herbfield complex	Species decline expected if more than two successive fires occur at intervals of less than 5 years. Species decline expected if more than two successive fires occur at intervals of more than 15 years.

Source: Bradstock et al, 1995.