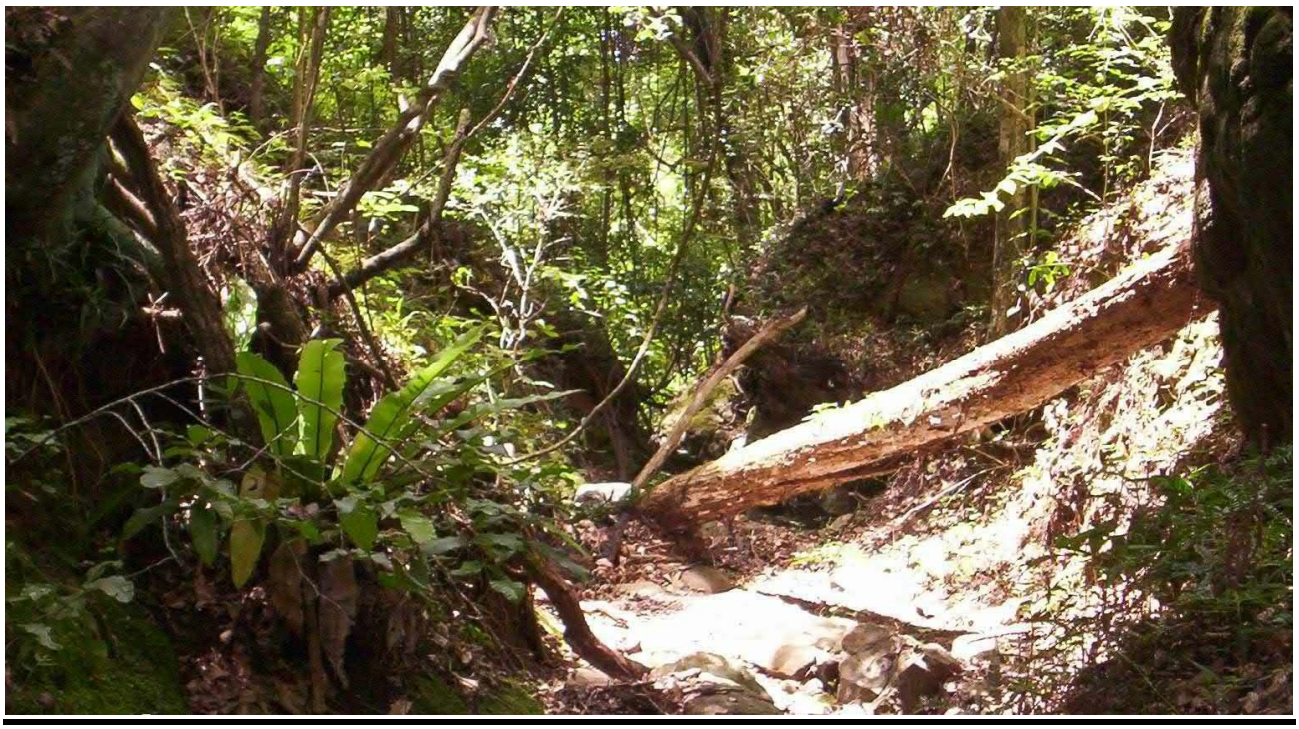
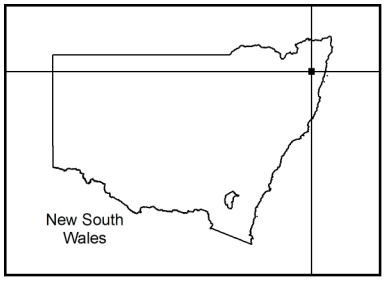
Office of Environment & Heritage
NSW National Parks & Wildlife Service

Plan of Management



Ramornie National Park



RAMORNIE NATIONAL PARK

PLAN OF MANAGEMENT

NSW National Parks and Wildlife Service

December 2011

This plan of management was adopted by the Minister for the Environment on 12 December 2011.

Acknowledgements

This plan of management is based on a draft plan prepared by staff of the North Coast Region of the NSW National Parks and Wildlife Service (NPWS), part of the Office of Environment and Heritage, Department of Premier and Cabinet.

The NPWS acknowledges that this park is in the traditional country of the Gumbaynggir people, today represented by the Barra:way Wa:jad Elders and members of the Grafton Ngerrie Local Aboriginal Land Council.

For additional information or any inquiries about this park or this plan of management, contact the NPWS Clarence South Area Office (level 3, 49 Victoria Street, Grafton 2460) or by telephone on 02 6641 1500.

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FOREWORD

Ramornie National Park is located 40 kilometres west of Grafton on the NSW North Coast. It was reserved in 1999 and covers 3,307 hectares. The park is in two portions separated by Ramornie State Forest.

Ramornie National Park contains 328 native plant species, including two vulnerable species and eleven species of significance. There is a relatively high diversity of eucalypt species with 16 species recorded. The gallery dry rainforest is considered part of an endangered ecological community.

The park is also particularly significant for the conservation of woodland birds, owls, gliders, bats and small mammals. There are 22 threatened fauna species currently recorded in the park, with a further five species predicted to occur.

The park also contains an Aboriginal site and a number of historic sites, including a tick quarantine fence, the stumps of a former tick inspector's building and a stockman's shelter.

The New South Wales *National Parks and Wildlife Act 1974* requires that a plan of management be prepared for each national park. A draft plan of management for Ramornie National Park was placed on public exhibition from 15th May until 31st August 2009. The submissions received were carefully considered before adopting this plan.

The plan contains a number of actions to protect the natural values of the reserve, including surveys and research for threatened animal species, the implementation of actions to control erosion and to assist the recovery of threatened species and endangered ecological communities, and control of introduced plants and animals. The plan also provides for continued vehicle-based touring, bushwalking, bush camping and picnicking in the park.

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

Robyn Parker MP
Minister for the Environment

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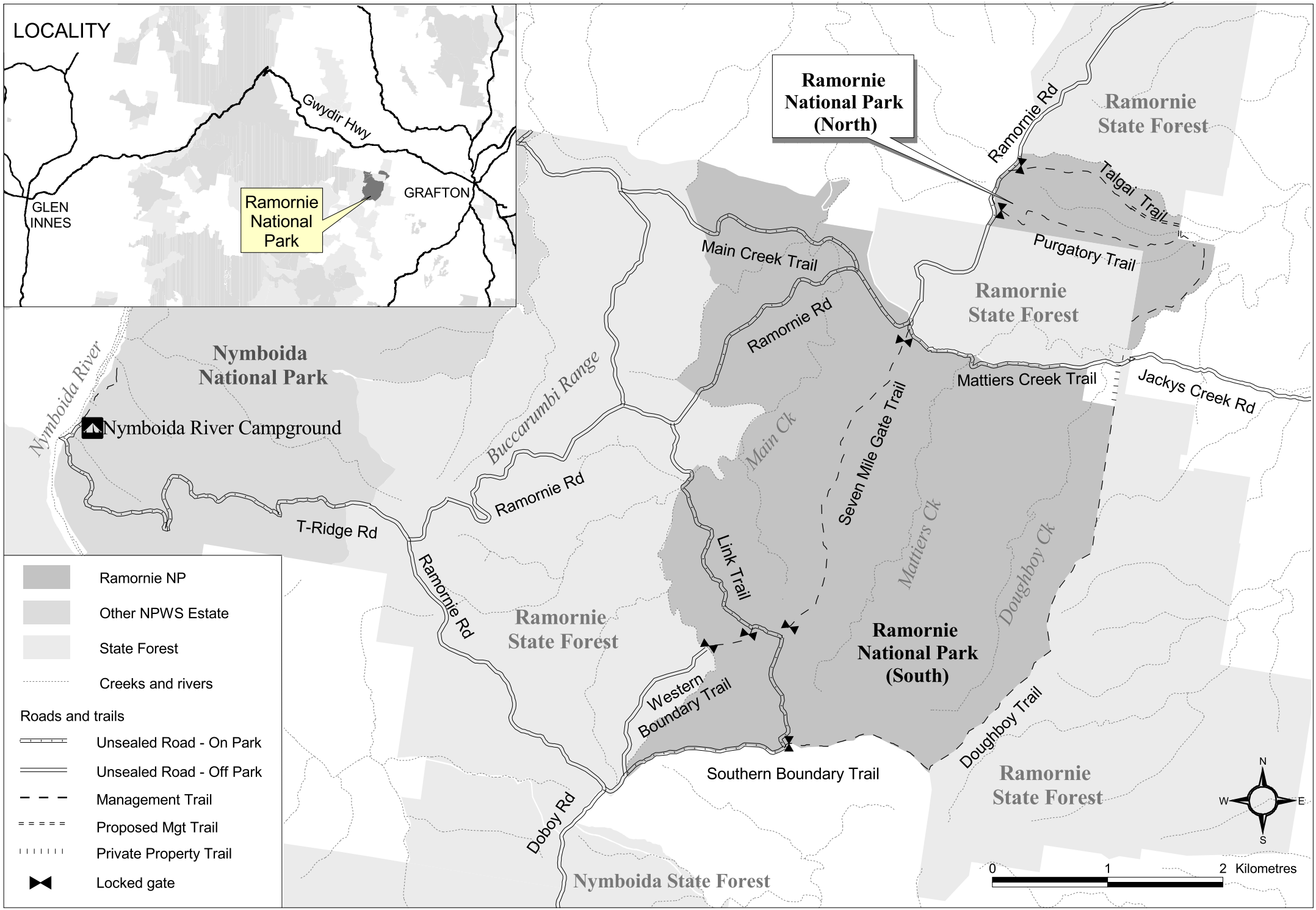
LOCALITY
Gwydir Hwy
GLEN INNES
GRAFTON
Ramornie National Park
Ramornie National Park (North)
Ramornie State Forest
Talgai Trail
Purgatory Trail
Main Creek Trail
Ramornie Rd
Nymboida National Park
Nymboida River
Nymboida River Campground
Buccarumbi Range
Mattiers Creek Trail
Jackys Creek Rd
Main Ck
Seven Mile Gate Trail
Mattiers Ck
Doughboy Ck
T-Ridge Rd
Link Trail
Ramornie National Park (South)
Western Boundary Trail
Doughboy Trail
Southern Boundary Trail
Doboy Rd
Nymboida State Forest
Ramornie NP
Other NPWS Estate
State Forest
Creeks and rivers
Roads and trails
Unsealed Road - On Park
Unsealed Road - Off Park
Management Trail
Proposed Mgt Trail
Private Property Trail
Locked gate
N
W
E
S
0
1
2 Kilometres

1. RAMORNIE NATIONAL PARK

Ramornie national park is located 40 kilometres west of Grafton (29º41.4'S, 152º55.8'E) within the Clarence Valley on the NSW North Coast. It was reserved as part of the negotiations leading to the North East Regional Forest Agreement in 1999 and additions to the park were made in 2003. The park is currently 3307 hectares in size and is in two portions (see map).

The park was formerly part of the Ramornie state forest. The name of the park was taken from the name of the state forest, which in turn comes from a nearby locality and the original pastoral station established in the district.

Ramornie national park provides an important eastern projection of the protected area complex of Nymboida, Washpool and Gibraltar Range national parks, and forms part of a regional corridor for wildlife movement that links the tablelands well down into the Clarence Valley coastal midlands. It straddles the transition between the undulating lowlands and the escarpment foothills, and comprises a series of ridges with altitudes ranging from 70 metres above sea level to 330 metres.

The park contains a high diversity of ecosystems with multiple rocky sandstone ridges dissected by incised gullies and ephemeral creeks draining into small lagoons and grassy flats. These features support a significant range of flora and fauna species. The park also has important landscape values, with the south eastern corner of the park providing broad views of the Clarence Valley to the north east, and the Great Dividing Range and tablelands to the west.

Surrounding land use is predominantly forestry and grazing. Ramornie state forest adjoins the park to the west and east, and separates the two portions of park, with the eastern and intervening parts of the forest declared over perpetual Crown leases. Grazing also occurs on the northern and southern park boundaries on neighbouring freehold land.

Reflecting its previous tenure, the park is currently zoned 1(f) forests under the Nymboida Local Environmental Plan (LEP). The stated purpose of this zone is for forestry and other ancillary purposes (Nymboida Shire Council 1986), and is inconsistent with the park's current status as a national park. This will be amended in the new Clarence Valley LEP.

The park sits within the areas of the Clarence Valley Council, the Northern Rivers Catchment Management Authority and the Grafton Ngerrie Local Aboriginal Land Council (LALC). The Barra:way Wa:jal Elders Group represents the traditional owners. Grafton Ngerrie LALC owns a small block of land bordering the southern portion of the park.

As well as the gazetted area of Ramornie national park, the area covered by this plan (referred to as 'the planning area') includes Crown lands which are vested in the Minister administering the *National Parks and Wildlife Act 1974* (NPW Act) for the purposes of Part 11 of the Act. These lands include those sections of Ramornie Road, Main Creek Trail and Mattiers Creek Trail which traverse the park. Their exclusion from the formal gazetted area of park assists in providing a continuation of access arrangements to neighbouring private land and state forest.

2. MANAGEMENT CONTEXT

2.1 Legislative and Policy Framework

The management of national parks and any Part 11 lands in NSW is in the context of a legislative and policy framework, primarily the NPW Act, the NPW Regulation, the *Threatened Species Conservation Act 1995* (TSC Act) and the policies of the National Parks and Wildlife Service (NPWS). These policies are based on the legislative background and internationally accepted principles of park management and relate to nature conservation, Aboriginal and historic heritage conservation, recreation, commercial use, research and communication.

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

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

2.2 Management Purposes and Principles

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

Under section 30E of the Act, national parks are managed to:

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

2.3 Management Directions

As well as the management principles stated above, the following specific management directions will be applied to the management of Ramornie National Park.

- Retain the low-key nature of the planning area by promoting nearby developed campgrounds in Nymboida National Park, Nymboi-Binderay National Park, Mann River Nature Reserve and at Dalmorton in Guy Fawkes River State Conservation Area as alternative recreational destinations.
- Encourage restoration of areas subject to previous disturbance, such as the cleared flats along Main Creek, through strategic weed and fire control.
- Close and rehabilitate trails not needed for management purposes, and effectively enforce restrictions to limit impacts from recreational vehicles.
- Continue to protect the planning area from unplanned fire and inappropriate fire regimes to enhance the biodiversity values of the park.
- Continue to work with neighbours to effectively prevent incursions by cattle in the planning area.

3. VALUES OF THE PLANNING AREA

The location, landforms and plant and animal communities of an area have determined how it has been used and valued. Both Aboriginal and non-Aboriginal people place values on natural areas, including aesthetic, social, spiritual and recreational values. These values may be attached to the landscape as a whole or to individual components, for example to plant and animal species used by Aboriginal people. This plan of management aims to conserve both natural and cultural values. For reasons of clarity and document usefulness, natural heritage, cultural heritage, threats and on-going use are dealt with individually, but their inter-relationships are recognised.

3.1 Landform, Geology and Soils

The western part of the planning area contains some of the older sediments in the Clarence Valley, deposited in the Ordovician – Silurian period, about 430 to 500 million years ago. These sediments were fine-grained clays and were associated with some volcanics (Veness & Associates 1994).

The eastern part of the planning area sits on the western margin of the Clarence-Moreton basin. The earliest sediments of this geology were deposited in the Triassic period 190 to 225 million years ago and these were further overlain by the series of sandstones, siltstone and claystone (with basal conglomerates) which comprise the Marburg formation in the upper Triassic – Lower Jurassic periods and by the medium- to fine-grained sediments of the Walloon coal measures in the Jurassic. This material outcrops on the eastern edge and northern eastern corner of the park.

Soils across the planning area are at high risk of erosion (Riddler & Hawkin 1981). Erosion has occurred in the park due to the presence and use of roads and trails, frequent fire, cattle grazing and off-road vehicle use.

The park is located in the relatively dry lowlands of the Clarence basin with an elevation range of 70 to 330 metres above sea level. The northern section of the park and the eastern half of the southern section drain into the Orara River. The western half of the southern section drains via Main Creek directly into the Clarence River. Based on records from nearby Grafton, average rainfall is approximately 980 millimetres per year, most of which falls in summer.

3.2 Native Plants

Ramornie National Park features several forest ecosystems (see Table 1), most of which are poorly represented in the reserve system. The park includes a major representation of the Clarence dry sclerophyll forests, dominated by spotted gum (*Corymbia variegata*), grey box (*Eucalyptus moluccana*) and ironbarks. Over much of their range, these forests have been fragmented by clearing, and degraded by grazing and frequent burning. As a consequence, remnants generally have a simplified understorey and are now unlikely to include the full range of plant communities that originally made up this class (Keith 2004). While substantial areas of Clarence dry sclerophyll forests remain, few of these are protected in reserves.

Table 1: Forest ecosystems present in Ramornie National Park

*Community type**	*Dominant species*	*Hectares^ in the park*
Dry sclerophyll forest with mixed grassy/ shrubby understorey	spotted gum (*Corymbia variegata*) grey box (*Eucalyptus moluccana*) white mahogany (*E. carnea*) ironbark (*E. crebra* and *E. fibrosa)*	2950
Sclerophyll woodland with grassy understorey	forest red gum (*E. tereticornis*)	225
Dry sclerophyll forest with shrubby understorey	coastal blackbutt (*E. pilularis*) spotted gum (*Corymbia variegata*)	45
Grassland	Native and introduced grass species	35
Rock/ sand		20
Wet sclerophyll forest with rainforest understorey	brush box (*Lophostemon confertus*)	8
Rainforest	hoop pine (*Araucaria cunninghamii*) brush box (*Lophostemon confertus*)	2

* Fire class after Kenny *et al.* 2004
^ areas derived from GIS and so may differ slightly from gazetted areas

The broader creek lines feature grassy woodlands dominated by forest red gum (*E. tereticornis*), although more mesic communities are also present in gullies and along ephemeral streams. In some protected gullies, this develops into a form of dry rainforest. These rainforests are considered to form part of an endangered ecological community, Lowland Rainforest in the NSW North Coast Bioregion, which is listed under the TSC Act (NSW Scientific Committee 2007).

In the mid 1990s, the Natural Resources Audit Council (NRAC) funded two plot-based flora surveys within what is now the park. A more comprehensive flora survey has recently been completed (Edwards & Edwards 2008). Based on these surveys, a total of 328 native plant species have been recorded in the park, 13 of which are considered significant (Table 2). The park has a relatively high diversity of eucalypts, with 16 species recorded. Small areas dominated by very large old-growth specimens of broad-leafed red ironbark (*Eucalyptus fibrosa*) occur in the southern end of the park.

In the surrounding district, there is an overlap in distribution of three closely related species of broad-leaved apple (namely *Angophora subvelutina*, *Angophora robur* and *Angophora woodsiana*), with the potential for hybrids to occur in the area (P. Meek, FNSW, pers. comm. 2008).

Table 2: Significant plant species recorded in Ramornie National Park

Common name	*Scientific name*	*Significance*
Square-fruited ironbark	*Eucalyptus tetrapleura*	Vulnerable * #
Tall bitter pea	*Daviesia arborea*	Only record in Clarence Valley
Hairy bitter pea	*Daviesia villifera*	At southern limit of range
Bat's wing coral tree	*Erythrina vespertilio*	At southern limit of natural range
Yellow box	*Eucalyptus melliodora*	Potentially at eastern limit Uncommon in Clarence valley
Milk pea	*Galactia tenuiflora* var. *lucida*	Regionally rare
Willow-leaved hakea	*Hakea florulenta*	Close to southern limit of
Swamp lily	*Ottelia ovalifolia*	Regionally uncommon
Prickly shaggy pea	*Podolobium ilicifolium* (syn. *Oxylobium ilicifolium*)	Uncommon in Clarence Valley
Buttonweed	*Spermacoce brachystema*	Close to southern limit
Tephrosia	*Tephrosia filipes*	Vulnerable*
Wild cow pea	*Vigna vexillata*	Regionally uncommon
Grass tree	*Xanthorrhoea malacophylla*	Close to northern limit

Source: Edwards & Edwards 2008 * Status under TSC Act; # also listed under the C'th EPBC Act

The park, together with Nymboida National Park and Ramornie State Forest, provides a vegetated corridor between the New England Tablelands and the Clarence Valley midlands. The most significant future determinants of vegetation structure and health are inappropriate fire regimes, weed infestations along riparian areas and grazing by straying cattle (see section 4).

3.3 Native Animals

The diversity of ecosystems in the park, the presence of old-growth forest and the park's location within a regional corridor for wildlife movement (Scotts 2003) contribute to a diversity of animal species in the park.

The park includes part of a priority site for fox control under the NSW Fox Threat Abatement Plan (NPWS 2001). Since 2003 under the terms of the threat abatement plan, Ramornie National Park has been surveyed each year to determine the response of the rufous bettong population to efforts to control the European red fox (*Vulpes vulpes*). While this monitoring program has also collected information on a range of native mammal and avian fauna, as well as the population of foxes, gaps in knowledge still remain.

Threatened species recorded in the park are listed in Table 3. The park also provides suitable habitat for a range of other threatened fauna which are predicted to occur in the park, including microbats and arboreal mammals, listed in Table 4.

Table 3: Threatened animal species recorded in Ramornie National Park

Common name	***Scientific name***	***Legal Status****
Frogs and reptiles		
Pale headed snake	*Hoplocephalus bitorquatus*	Vulnerable
Green-thighed frog	*Litoria brevipalmata*	Vulnerable
Birds		
Bush stone-curlew	*Burhinus grallarius*	Endangered
Glossy black-cockatoo	*Calyptorhynchus lathami*	Vulnerable
Brown treecreeper (eastern sub-species)	*Climacteris picumnus victoriae*	Vulnerable
Varied sittella	*Daphoenositta chrysoptera*	Vulnerable
Little lorikeet	*Glossopsitta pusilla*	Vulnerable
Black bittern	*Ixobrychus flavicollis*	Vulnerable
Black-chinned honeyeater (eastern sub-species)	*Melithreptus gularis gularis*	Vulnerable
Powerful owl	*Ninox strenua*	Vulnerable
Grey-crowned babbler (eastern sub-species)	*Pomatostomus temporalis temporalis*	Vulnerable
Diamond firetail	*Stagonopleura guttata*	Vulnerable
Masked owl	*Tyto novaehollandiae*	Vulnerable
Mammals		
Rufous bettong	*Aepyprymnus rufescens*	Vulnerable
Hoary wattled bat	*Chalinolobus nigrogriseus*	Vulnerable
Spotted-tailed quoll	*Dasyurus maculatus*	Vulnerable #
Eastern bent-wing bat	*Miniopterus schreibersii oceanensis*	Vulnerable
Yellow-bellied glider	*Petaurus australis*	Vulnerable
Koala	*Phascolarctos cinereus*	Vulnerable
Grey-headed flying-fox	*Pteropus poliocephalus*	Vulnerable #
Greater broad-nosed bat	*Scoteanax rueppellii*	Vulnerable
Eastern cave bat	*Vespadelus troughtoni*	Vulnerable

* Legal status is that given by TSC Act # also listed under C'th EPBC Act

Table 4: Threatened animal species predicted to occur in Ramornie National Park

Common name	*Scientific name*	*Status under TSC Act*
Birds		
Red goshawk	*Erythrotriorchis radiatus*	Endangered#
Hooded robin (south-eastern form)	*Melanodryas cucullata cucullata*	Vulnerable
Mammals		
Little bent-wing bat	*Miniopterus australis*	Vulnerable
Squirrel glider	*Petaurus norfolcensis*	Vulnerable

Brush-tailed phascogale	*Phascogale tapoatafa*	Vulnerable

Source: NPWS 1999 # also listed under C'th EPBC Act

3.4 Aboriginal Heritage

Aboriginal communities have an association and connection to the land. The land and water within a landscape are central to Aboriginal spirituality and contribute to Aboriginal identity. Natural areas such as the park are associated with the use and enjoyment of foods and medicines, caring for the land, passing on cultural knowledge, kinship systems and strengthening social bonds. Aboriginal heritage and connection to nature are inseparable from each other and need to be managed in an integrated manner across the landscape.

The Clarence Valley is significant to Aboriginal people and their culture, with a diverse and rich history of land use and many sites of regional importance. The earliest Aboriginal occupation site recorded in the region is the Seelands Rock shelter, a site dating to 6500 years before present (McBryde 1966) located to the east of the park. The planning area is likely to have been used as travel paths for people moving between the Orara River and Blaxlands Creek (ERM Mitchell McCotter 1998).

A large tool scatter has been recorded within the planning area adjacent to Main Creek, and three further sites are recorded nearby on state forest. It is likely that other sites are also present in the area.

Ramornie National Park lies within the traditional lands of the Gumbaynggir people, today represented by members of the Grafton Ngerrie Local Aboriginal Land Council (LALC) and the Barra:way Wa:jal Elders. The Grafton Ngerrie LALC acquired freehold title to a former travelling stock reserve on the north east corner of the southern portion of the park in 1999.

3.5 Historic Heritage

The Clarence Valley was extensively explored in the late 1830s by early cedar cutters, who followed the rivers upstream in pursuit of cedar. Support infrastructure such as shipping ports soon began to develop, encouraging settlement by farmers and merchants, and the creation of towns.

Large pastoral stations were soon selected. The 14 000 hectare "Ramornie Station" was first established by John Dobie in November 1839 on the banks of the Clarence and Orara rivers, and incorporated the land now protected in Ramornie National Park. John Dobie was a Scottish immigrant originally from the town of Dysart in the Shire of Fife, and his station was named after a small hamlet to the north of Dysart (Mackey 2001). As with other stations established in the Clarence Valley, initial production focussed on wool and then, after sheep were replaced by cattle, by tallow (Blackmore & Associates 1993).

In 1861 the Robertson Land Act resulted in break up of the large leasehold pastoral runs, the encouragement of the selection of smaller farms often in more marginal agricultural country, and higher intensity production of dairy, pigs, maize and cotton (ERM Mitchell McCotter 1998). Much of the land covering what is now the park had been resumed by 1890 when the forest was formally reserved, first as a forest reserve and then as a state forest in 1919.

The park contains evidence of the operations of the NSW Tick Control Board which was established in 1920 to eradicate cattle tick (*Boophilus microplus*) from northern NSW. The park lies within the Grafton–Copmanhurst quarantine zone which was

declared tick free in 1944, reinfested in 1959, again declared tick free in 1962, reinfested in 1965 and then permanently released from quarantine in 1977 (NSW Agriculture 1998). Today, the infrastructure within the park associated with the quarantine zone includes 10 kilometres of single-width tick fencing along Seven Mile Gate Trail and between the Main Creek/Mattiers Creek travelling stock route and the park's southern portion, and the stumps of a building at the junction of Seven Mile Gate and Mattiers Creek trails. Remnants of a dip and yards on Main Creek lie immediately adjacent to the park on the north-western corner of Seven Mile Reserve, a camping reserve which was part of the travelling stock route along the northern boundary of the park's southern portion.

During much of the 20th century, the park was held under various occupational permits for grazing. Evidence of this aspect of the park's history includes some internal fencing in various stages of disrepair, a stockman's shelter, fireplace and holding yard on Main Creek, cleared flats along Main and Mattiers creeks, and two dams adjacent to Mattiers Creek and Main Creek trails. The shelter is considered to be part of a complex of stockman's huts and shelters that also includes several examples in nearby Nymboida National Park. The existing road and trail network is based upon former grazing and logging activities.

3.6 Recreation Values

The park is transited by many of the visitors travelling to the popular Nymboida River Campground in the nearby Nymboida National Park, which is well known to Clarence Valley and Coffs Harbour residents. While the majority of visitors are currently from these areas, an increasing proportion comes from south-east Queensland. However NPWS traffic monitoring equipment positioned on T-Ridge Road (at the entrance to Nymboida National Park) shows a declining trend in visitation in the past three years.

Ramornie National Park has a number of natural and cultural features of interest to visitors, including views, perennial waterholes, and a sense of remoteness and isolation. It is used on a small yet growing scale for vehicle-based recreation, primarily motorcycles and 4WD vehicles. Recreational horse-riding does not occur in the park. Small scale camping and picnicking occurs along Main Creek with access informally provided off Ramornie Road.

Ramornie National Park provides a similar setting and geographic position to several camping and picnic areas in nearby national parks. The closest to Ramornie National Park is the Nymboida River Campground in Nymboida National Park, approximately 12 kilometres to the west. Others in the surrounding district include The Junction in Nymboi-Binderay National Park, Dalmorton campground in Guy Fawkes River State Conservation Area and the Mann River campground in Mann River Nature Reserve.

Recreational opportunities that are available in the planning area include vehicle-based touring, picnicking, bush camping, bushwalking, and cycling along management trails and roads. There are no visitor facilities in the park.

4. THREATS TO THE PLANNING AREA'S VALUES

4.1 Introduced Plants

The introduced plant species recorded within the planning area are listed in Table 5. The predominant weed threats are from several exotic grasses, which grow along roads, trails and river flats, and lantana *(Lantana camara)* which grows throughout the park in areas disturbed by grazing, logging and fire.

Exotic perennial grasses can invade and dominate some native plant communities. Characteristics, such as vigorous growth, prolific seed production and effective seed dispersal, enable these species to out compete and displace native species (NSW Scientific Committee 2003). Invasion by exotic perennial grasses is listed as a key threatening process under the TSC Act.

Lantana, a native of South America introduced to Australia in 1841, grows on a range of soils and readily invades disturbed sites and plant communities. Dispersed by fruit-eating birds, the weed has invaded four million hectares in NSW and Queensland. It modifies soil microhabitat and suppresses growth of native plants, and is a recognised threat to a range of NSW threatened flora and fauna (NSW Scientific Committee 2006). Described as one of the worst weeds in Australia due to its invasiveness, potential for spread and the economic cost (CRC Weed Management 2003 as cited NSW Scientific Committee 2006), it is regarded as a weed of national significance. Invasion by lantana is also listed as a key threatening process under the TSC Act.

Table 5: Weeds of Ramornie National Park

Common Name	*Scientific name*	*Common Name*	*Scientific name*
Red cotton bush	*Asclepias currasavica*	**Exotic Grasses**	
Cobblers pegs	*Bidens pilosa*	Blue summer grass	*Digitaria violescens* ^
Spear thistle	*Cirsium vulgare*	Barnyard grass	*Echinochloa crus-galli* ^
Fleabane	*Conyza albida*	Crabgrass	*Eleusine tristachya* ^
Fleabane	*Conyza parva*	Paspalum	*Paspalum dilatatum* ^
Paddy melon	*Cucumis zeyheri*	Bahia grass	*Paspalum notatum* ^
Balloon cotton bush	*Gomphocarpus physocarpus*	Pale pigeon grass	*Setaria pumila* ^
Catsear	*Hypochaeris radicata*	Giant Parramatta grass	*Sporobolus fertilis* ^ #
Lantana	*Lantana camara* ^ # *	Carpet grass	*Xonopus affinis* ^
Swamp foxtail	*Pennisetum alopecuroides*		
Water pepper	*Persicaria hydropiper*		
Mexican clover	*Richardia braziliensis*		
Wild sage	*Salvia coccinea*		
Fireweed	*Senecio madagascariensis*		
Paddy's lucerne	*Sida rhombifolia*		
Indian weed	*Sigesbeckia orientalis*		
Wild tobacco bush	*Solanum mauritianum*		
Black-berry nightshade	*Solanum nigrum*		
Common sowthistle	*Sonchus oleraceus*		
Stinking roger	*Tagetes minuta*		
White clover	*Trifolium repens*		

Source: NPWS (2000)
Declared noxious under *Noxious Weed Act 1993* in Clarence Valley Local Government Area
* Declared weed of national significance
^ Key threatening process under *TSC* Act

Purple top	*Verbena bonariensis*
Rough verbena	*Verbena hispida*
Noogoora burr	*Xanthium sp. #*

4.2 Introduced Animals

Introduced animals known to occur in the park include the European red fox and feral cat (*Felis catus*). These pest animals are of concern because they have the potential to have detrimental effects on native animal communities through predation. Predation by foxes and predation by cats are both listed as key threatening processes under the TSC Act.

Foxes are currently controlled in Ramornie National Park, Ramornie State Forest and on adjoining private property under the terms of the NSW Fox Threat Abatement Plan (NPWS 2001). As discussed in section 3.3, Ramornie National Park is a target site for control of foxes to protect the vulnerable rufous bettong. The monitoring program, which measures the effects of control efforts on fox and bettong numbers, has shown that the control program has been successful in greatly reducing fox numbers in the park. Cat numbers are low and control is incidental.

Wild dogs have been recorded in Ramornie National Park. Wild dogs, including dingoes, have been declared as pest animals under the *Rural Lands Protection Act 1998* (RLP Act) and must be controlled throughout NSW. Under the NPW Act, however, dingoes are considered native and are protected in national parks. Ramornie National Park is one of a number of parks and forests which are considered to contain high quality dingo habitat and which have been listed as dingo management areas in the Wild Dog Control Order made under the RLP Act. Wild dog management plans are prepared for dingo management areas by the NPWS and the local Livestock Health and Pest Authority (and Wild Dog Control Association) with the dual aims of minimising livestock predation and conserving dingoes in core areas.

Cattle were grazed across the planning area for many years under the terms of annual grazing permits issued over the former Ramornie State Forest. The licences were terminated on gazettal of Ramornie National Park. Straying cattle, however, remain an issue in the northern portion of the park.

4.3 Inappropriate Fire Regimes

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

Table 6: Fire interval guidelines for the park's vegetation communities

Vegetation Formation	*Minimum Interval (years)*	*Maximum Interval (years)*	*Notes*
Rainforest	n/a	n/a	Fire should be avoided
Wet sclerophyll forest, shrubby understorey	25	60	Crown fires should be avoided at the lower end of the interval range
Grassy woodland	5	40	
Dry sclerophyll forest, grassy understorey	5	50	
Dry sclerophyll forest, shrubby understorey	7	30	

Source: Kenny *et al*. 2004

Requirements for most plant species can be summarised on the basis of vegetation communities. The fire regime guidelines for the park's vegetation communities are listed in Table 6. Variability of fire interval should occur within the suggested guidelines to maximise native biodiversity, and should be ultimately constrained by the ability of the vegetation to recover between fires.

For much of the past century, the area that is now the park was regularly burnt to maintain native pasture for cattle grazing. Historically high-frequency fire has been the major threat to the park's natural values. Since the removal of cattle, the frequency and intensity of fires has reduced considerably. As a result, the forest structure has notably improved. The fires that have occurred in the park in the past decade have generally originated from arson activities both in the park and on adjacent lands.

A fire management strategy has been prepared for the park (NPWS 2005). This outlines the recent fire history of the park, key assets within and adjoining the park including sites of natural and cultural heritage value, and fire control advantages such as management trails and water supply points.

The strategy also outlines the fire management zones in the park. The NPWS uses a zoning system for bushfire management which is compatible with the zoning used by the Clarence Valley Bush Fire Management Committee (BFMC) in its bushfire risk management plan. In the strategy, most of the park is zoned as a Heritage Management Zone (equivalent to Land Management Zone under the BFMC risk management plan), in which as far as possible the vegetation formations are maintained consistent with the fire regimes outlined in Table 6. Other zones present in the park include mown asset protection zones around the stockman's shelter and the stumps of the former tick building, and several strategic fire advantage zones along park boundaries, Ramornie Road and Main Creek Trail to prevent broad-scale fire movement throughout the park and onto and off the park.

4.4 Isolation and Fragmentation

Ramornie National Park is a small part of an extensive belt of public land, including state forest and other national parks, that is an important regional corridor for wildlife movement linking the tablelands with the coastal plain (Scotts 2003).

However, the area surrounding Ramornie National Park has been modified through logging, roading and some clearing. Long term conservation of biodiversity depends upon the protection, enhancement and connection of remaining habitat across the

landscape, incorporating vegetation remnants on both public and private lands. Nearby vegetated areas contribute to the habitat values of the park and provide ecological corridors to other forested areas. Maintaining the integrity of the remaining habitat within the park and, where possible, linking this to adjacent areas of bushland to facilitate wildlife corridors is important in ensuring long term viability of the park's biological values.

The park's configuration in two separate portions adds to concerns about the viability of the park's habitat values, particularly in the northern, smaller portion. Strategic purchases of land, as opportunities arise and resources permit, can be used to reduce the fragmentation of the park.

4.5 Visitor Impacts

Roads and trails within the park are susceptible to damage during wet weather use, particularly those with clay pavements, creek crossings and steep terrain. The designation of some trails as management trails (as shown on the map) aims to limit this damage.

Ramornie Road is the primary access road to the park. It was originally constructed by the then Forestry Commission of NSW as an all weather gravel road to access Ramornie State Forest. Today it provides the primary access to both Ramornie and Nymboida national parks, as well as the remaining sections of Ramornie State Forest. Since Ramornie National Park was created, Forests NSW and the local council have withdrawn road maintenance efforts to the point where NPWS is exclusively maintaining the entire length of Ramornie Road between the Gwydir Highway and T-Ridge Road. NPWS maintains this road to a dry-weather four wheel drive standard. Use in wet weather, adds to maintenance costs.

Presently there is an unofficial pull over area where Ramornie Road crosses Main Creek. In recent years, camping and picnicking has increased in this area, resulting in the creation of fire scars, numerous informal vehicle tracks and erosion of an improvised creek crossing upstream on Main Creek. There have also been reported incidents of arson in the planning area.

Currently the trail system provides unhindered access to private property to the north and east of the park. Neighbours have raised concerns that people are using these trails to gain access for illegal activities such as property theft and vandalism. To address this issue, it is proposed that the eastern half of Southern Boundary Trail, as well as Talgai and Purgatory trails be closed to the general public and maintained as management trails. There are alternative access routes to these neighbouring properties.

4.6 Climate Change

Anthropogenic climate change has been listed as a key threatening process under the TSC Act. Projections of future changes in climate for NSW include more intense but possibly reduced annual average rainfall, increased temperature extremes and higher evaporation. These changes are likely to lead to greater intensity, duration and frequency of fires, more severe droughts and increased regional flooding.

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

rates. The specific impacts of climate change on the park are difficult to assess since they will depend on the compounding effects of other pressures, particularly barriers to migration and pressure from weeds and feral animals. However it is likely that the small areas of wet sclerophyll forest and rainforest, will be under greater stress from fire and drought. It is also likely that erosive rainfall events will be more common, negatively impacting upon water quality in the creeks and streams in the park. Programs to reduce pressures arising from such threats will help reduce the severity of the effects of climate change.

5. MANAGEMENT STRATEGIES AND ACTIONS

Current Situation	Desired Outcomes	Management Strategies / Actions	Priority
5.1 Soil and Water Conservation Several ephemeral creeks drain the park, feeding into both the Orara and Clarence rivers. Soils within the planning area are highly prone to erosion. Erosion potential is exacerbated by steep slopes and the number of informal creek crossings. Erosion is evident on the majority of roads and trails within the park and along Mattiers, Doughboy and Main creeks. It is primarily caused by vehicle use during wet weather.	Soil erosion is minimised. Water quality and health of reserve streams is improved.	5.1.1 Continue to monitor erosion on roads and trails. Initiate erosion controls measures as required. 5.1.2 In accordance with NPWS policy, prohibit public vehicular use of management trails shown on the map. Install signage and locked gates to prevent unauthorised use. 5.1.3 Liaise with neighbours, beekeepers and Forests NSW to discourage heavy vehicle movements in wet weather along the whole length of Ramornie Road, and on Mattiers Creek Trail and Main Creek Trail in the planning area.	High High Medium
5.2 Native Plants and Animals The planning area contains 328 native plant species, including two vulnerable species and eleven species of significance. There is a relatively high diversity of eucalypt species with 16 species recorded. Of the forest ecosystems present in the park, the gallery dry rainforest is considered part of an endangered ecological community. The park is also particularly significant for the conservation of woodland birds, owl, glider, bat and small mammal fauna. There are 22 threatened species of fauna currently recorded from the park (see Table 3) with a further five species predicted to occur (listed in Table 4).	Native species and communities are conserved. Structural diversity and habitat values are restored in areas subject to past disturbance. Corridor values are retained and enhanced. Understanding of	5.2.1 Promote expansion of the dry rainforest community and areas subject to previous disturbance, such as the cleared flats and riparian zone along Main Creek, through control of cattle and weeds, and exclusion of fire. 5.2.2 Identify threatened plants adjacent to roads and trails, and avoid impacts during road works. 5.2.3 Continue to monitor the distribution and abundance of populations of rufous bettong in accordance with the Fox Threat Abatement Plan. 5.2.4 Encourage independent research or undertake targeted surveys and research for other threatened	High Medium High Medium

Current Situation	Desired Outcomes	Management Strategies / Actions	Priority
Recovery actions for threatened species are given in recovery plans (where prepared) and the Priorities Action Statement (PAS). The PAS currently contains strategies for the square-fruited ironbark and a number of fauna species found or predicted to occur in the park. While there has been a comprehensive flora survey for the park, fauna surveys have been focused on monitoring the response of rufous bettongs to fox control programs. Little is known of the bird and arboreal mammal populations in the park. The habitat value of the park would be improved by retention of vegetated corridors that link the park to the tablelands and the coastal plain foothills.	species diversity, distribution and ecological requirements is improved.	animal species, including: • woodland birds (e.g. hooded robin), • owls (e.g. powerful owl and masked owl), • ground-nesting birds (e.g. bush stone-curlew and black bittern), • microbats, • frogs, and • arboreal mammals. 5.2.5 Liaise with neighbours to encourage the retention and appropriate management of native vegetation adjacent to the park to maintain its connectivity and functioning as a corridor for wildlife movement. 5.2.6 Implement relevant recovery actions identified in the PAS.	 Medium High
5.3 Cultural Heritage A large tool scatter site has been recorded within the park along Main Creek and a further three Aboriginal sites have been recorded adjacent to the park. More sites are likely to be present within the planning area. The Grafton Ngerrie Local Aboriginal Land Council owns land adjacent to the park. A range of European cultural heritage items occurs in the park, including a tick quarantine fence, the stumps of a former tick inspector's building, a stockman's shelter, other fences and trails. Built assets may be threatened by insects, fire and damage by people. The shelter is considered to be part of a complex of stockman's	Aboriginal and historic features and values are identified and protected. Aboriginal people are involved in management of the Aboriginal cultural values in the park. Understanding of the cultural values	5.3.1 Consult and involve the Grafton Ngerrie Local Aboriginal Land Council, the Barra:way Wa:jad Elders group and relevant members of the Aboriginal community in the management of Aboriginal sites, places and values. 5.3.2 With the agreement and engagement of the Grafton Ngerrie LALC and Barra:way Wa:jad Elders, encourage or undertake further research/ surveys into the Aboriginal heritage values of the park. 5.3.3 Ensure road works within the Main Creek area are confined to the existing disturbed road pavement. 5.3.4 Record and assess the significance of historic	High Medium High Medium

Current Situation	Desired Outcomes	Management Strategies / Actions	Priority
huts and shelters that includes several examples in nearby Nymboida National Park. It is a priority for NPWS to document the history of the planning area from those that formerly used the area, while that knowledge is still available.	of the park is increased.	heritage items within the planning area. 5.3.5 Seek further information on the history and cultural heritage of the planning area, including oral histories. 5.3.6 Prepare a conservation management plan for the complex of stockmen's huts and shelters in Nymboida and Ramornie national parks. 5.3.7 As an interim measure, the shelter, holding yard and building stumps will be retained, protected against fire and termites as far as possible, and limited signage installed to identify them as historic sites to discourage vandalism. Other conservation works may be carried out pending the outcomes of the above actions. 5.3.8 Assess the value of internal fencing for park management purposes and remove the wire from those fences no longer required.	 High Low High Low
5.4 Introduced Plants and Animals The planning area has been surveyed for weeds. Lantana is the species of most concern, particularly in the riparian areas along Main Creek, where it degrades the habitat for black bittern, and in the vicinity of wet sclerophyll and rainforest communities. Exotic grasses are a problem along most roads and trails, and are hindering the regeneration of previously cleared flats along Main Creek. The park is part of a priority fox control area identified in the NSW Fox Threat Abatement	Introduced plants and animals are controlled and where possible eliminated. Pest control programs are undertaken in consultation with neighbours.	5.4.1 Continue to control weeds within the park in accordance with the North Coast Region Pest Management Strategy (DECC 2008). 5.4.2 Continue to monitor fox populations and implement a fox control program with Forests NSW and other neighbours in accordance with the Fox Threat Abatement Plan. 5.4.3 Carry out other pest control in reaction to reports/ sightings as part of fox control efforts or as resources are made available.	High High Medium

Current Situation	Desired Outcomes	Management Strategies / Actions	Priority
Plan. Fox control commenced in 2003 and the effects are being monitored. Feral cats are also known to occur in the park but control of this species will remain incidental and is not currently a priority. Small numbers of cattle currently stray into the northern portion of the park as a result of limited fencing and a difficult boundary alignment. Ramornie Road is used to access neighbouring private property and state forest. Vehicles transiting the park often carry pets or stock. Pets are not permitted to transit the park under the NPWS policy unless there is no practical alternative means of access to the private property. The park is identified as a dingo management area in the Wild Dog Control Order made under the RLP Act.	Boundary fencing is adequate to exclude stock from the park.	5.4.4 Ensure cattle are removed from the park as soon as possible. Horses may be used in mustering operations as long as NPWS is notified on each occasion. Fines may apply if stock are found in the park. 5.4.5 Assess existing boundary fencing and provide assistance under the terms of the NPWS boundary fencing policy to ensure effective fencing is in place. 5.4.6 Permit carriage of livestock and pets to neighbouring properties along Ramornie Road, Mattiers Creek Trail and Main Creek Trail. Animals must be contained within a vehicle at all times and remain in transit. 5.4.7 Assist in the preparation and implementation of a local wild dog management plan in accordance with the RLP Act.	High High High Medium
5.5 Fire Management The park has a history of being intensively and regularly burnt for pasture maintenance. The park is assessed as being at risk of being over burnt, with four wildfires in the park since 2000. There have been a number of other arson attempts in the park. Natural values threatened by wildfire include the small area of lowland rainforest in the park and, more broadly, the structural diversity of dry sclerophyll forest. Fauna species that may be affected by inappropriate fire regimes include the rufous bettong and bush stone-curlew.	Life, property and natural and cultural values are protected from fire. Fire frequencies are appropriate for conservation of native plant and animal communities.	5.5.1 Implement the reserve fire management strategy for the park and update as required at the start of each fire season. 5.5.2 Continue to participate in the Clarence Valley BFMC. Maintain cooperative arrangements with local RFS brigades, fire control officers and surrounding landowners including Forests NSW in regard to fuel management and fire suppression. 5.5.3 Manage the majority of the park to protect biodiversity in accordance with the identified fire interval guidelines for vegetation communities (Table	High High High

Current Situation	Desired Outcomes	Management Strategies / Actions	Priority
Cultural heritage items which may be threatened by wildfire and fire control operations include tool scatters, fences, the stockman's shelter and the stumps of the tick inspection building. The primary fire management objectives of the NPWS are to protect life and property from the adverse impacts of fire, while managing fire regimes to maintain and protect biodiversity and cultural heritage (NPWS 2007). NPWS is an active member of the Clarence Valley Bush Fire Management Committee (BFMC) and regards cooperative arrangements with neighbours and other fire authorities to be of prime importance. The planning area has an approved fire management strategy (NPWS 2005). Two asset protection zones are in place around cultural heritage items, and there are strategic fire advantage zones along some park boundaries and trails. Extensions are required to the management trail network (indicated on the map) to improve NPWS's capacity to control fire in the park. Two dams, located adjacent to Mattiers Creek and Main Creek trails, provide water for fire fighting purposes.		6). Prescribed burns may be used to achieve a mosaic of fire regimes within these guidelines. Where possible, fire will be excluded from fire-sensitive areas, including riparian vegetation, rainforest and recently burnt areas. 5.5.4 Construct a new section of management trail, as recommended in the fire strategy, linking Talgai Trail with Purgatory Trail to allow effective management of fire in the northern portion of the park (see map). 5.5.5 Retain the existing dams adjacent to Mattiers Creek and Main Creek trails to assist in fire control operations.	 Medium High
5.6 Recreational Opportunities Recreational use within the planning area is currently at low levels, and is primarily vehicle-based touring, bush camping and picnicking. A large proportion of visitors are travelling through the park to access the Nymboida River Campground. Roads and signs are currently the only visitor facilities within the park.	Visitor use is appropriate, ecologically sustainable and does not impact upon neighbours.	5.6.1 Allow public vehicles on roads indicated on the map but not elsewhere (i.e. not on management trails or off road). Allow cycling on roads and management trails. 5.6.2 Allow bush walking and picnicking anywhere in the planning area but only allow bush camping at	High High

Current Situation	Desired Outcomes	Management Strategies / Actions	Priority
The trails and creek flats are experiencing an increasing level of motorcycle and four wheel drive use. There are recreational impacts evident on trails from vehicle use in wet weather (see section 5.1) and from camping along Main Creek adjacent to the Ramornie Road. Park visitors on occasion stray onto neighbouring private property, creating security concerns for neighbours. Informal campfires are a potential source of bushfires. There are several high quality riverside camping and picnicking opportunities provided in the surrounding district, adjacent to the Nymboida, Boyd and Mann rivers. A similar development in Ramornie National Park would unnecessarily replicate these experiences. Monitoring of visitor numbers is currently via an existing traffic counter at nearby Nymboida National Park and regular inspections of the planning area. A visitor book, which is shortly to be installed at Nymboida River campground, may obtain additional information on visitor origins, style of use and expectations. There are currently no commercial tour operators licensed for the park but these would be permitted if consistent with the plan's strategies and if they have minimal impacts.	Visitor use encourages appreciation of the reserve's values.	sites more than one kilometre from the roads designated for public vehicle use. 5.6.3 Do not allow camp fires in the planning area. 5.6.4 Do not allow recreational horse riding in the planning area due to the erodibility of its soils and steep topography. 5.6.5 Formalise a parking bay on the side of Ramornie Road in the vicinity of Main Creek. Erect barriers to stop unauthorised vehicles driving off Ramornie Road along Main Creek. 5.6.6 In view of the existing riverside recreational opportunities in the surrounding district, no other recreational facilities will be developed within this planning area. 5.6.7 Retain information about Ramornie National Park in interpretation material (e.g. brochures) produced for Nymboida National Park.	 High High Medium High Low

5.7 Management Operations and Other Uses The principal management operations in the park are pest and fire control (refer 5.4 and 5.5), and the maintenance of roads and trails. There is a considerable maintenance burden associated with Ramornie Road and other roads and trails, given damage to erosive soils associated with wet weather use (refer 5.1). Ramornie Road, Mattiers Creek Trail and Main Creek Trail lie on Crown land that is not part of the park to ensure ongoing access to private property and state forest. The park is currently in two portions. The northern portion in particular is small and requires connectivity of habitat through the broader landscape to maintain its value. There are two apiary sites adjacent to Mattiers Creek Trail. These sites were originally established under a permit when the area was part of Ramornie State Forest and are considered existing interests.	Management facilities and operations adequately serve management needs and have minimal impact. Existing non-park uses are managed to minimise impacts on natural and cultural values. The local community is aware of the significance of the area and of management programs.	5.7.1 Continue to maintain the roads and management trails as shown on the map. All other trails will be closed and rehabilitated. 5.7.2 Continue to promote Ramornie Road as the primary access to both Ramornie and Nymboida national parks. 5.7.3 Liaise with Forests NSW, Clarence Valley Council and relevant landholders to ensure cooperative maintenance of Ramornie Road, Mattiers Creek Trail and Main Creek Trail. 5.7.4 As opportunities arise, seek to link the two portions of the park. 5.7.5 Continue to license and manage the two apiary sites within the park in accordance with NPWS policy. Relocate any apiary sites that significantly compromise the environmental values of the area in consultation with licensees.	High High Medium Medium High

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

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

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

6. REFERENCES

Blackmore & Associates (1993). *European Heritage: Historical Report*. Supplementary Report for the Grafton Forest Management Area Environmental Impact Statement. State Forests of NSW, Pennant Hills

DECC (2008). *North Coast Region Pest Management Strategy 2008 – 2011*. NSW Department of Environment and Climate Change, Sydney

Edwards, P. & Edwards, J. (2008). *Flora Study and Assessment of Ramornie National Park*. Unpublished report produced on behalf of the Clarence Environment Centre for the NPWS Clarence South Area, Grafton

ERM Mitchell McCotter (1998). Regional Water Supply Environmental Impact Statement. Prepared for the Lower Clarence County Council, Grafton and NSW Department of Public Works, Sydney

Keith, D. (2004). *Ocean Shores to Desert Dunes: The native vegetation of New South Wales and the Australian Capital Territory*. Department of Environment and Conservation NSW, Hurstville

Kenny, B., Sutherland, E., Tasker, E. & Bradstock, R. (2004). *Guidelines for Ecologically Sustainable Fire Management: A project undertaken for the NSW Biodiversity Strategy.* NSW National Parks and Wildlife Service, Hurstville

Mackey, N.M. (2001). *European Settlement in the Clarence River District before 1850. Description of runs in the Clarence River District Government Gazette Supplement 1848.* Nola. M. Mackey, Grafton Family History Centre, 995 Clarence Way. Grafton

McBryde, I. (1966). Radiocarbon Dates for Northern New South Wales. *Antiquity*. 11: 285-292

NPWS (1999). *Modelling Areas of Habitat Significance for Vertebrate Fauna and Vascular Flora in North-East NSW*. A project undertaken for the Joint Commonwealth NSW Regional Forest Agreement Steering Committee as part of the Comprehensive Regional Assessments. NSW National Parks and Wildlife Service, Coffs Harbour, NSW

NPWS (2000). *Exotic Species Report North Coast Region.* Unpublished report

NPWS (2001). *Threat Abatement Plan for Predation by the Red Fox* (Vulpes vulpes). NSW National Parks and Wildlife Service, Hurstville

NPWS (2005). *Ramornie National Park Fire Management Strategy*. Level 2 Strategy prepared by the North Coast Region of the NSW National Parks and Wildlife Service. Department of Environment and Conservation, Sydney
http://www.environment.nsw.gov.au/resources/parks/RamornieFms.pdf

NPWS (2007). *Fire Management Manual.* Revised edition. NSW National Parks and Wildlife Service, Hurstville

NSW Agriculture (1998). *Tick Notes: Tick Control in NSW*. Wollongbar Agricultural Institute, NSW Department of Agriculture, Wollongbar

NSW Scientific Committee (2003). Invasion of native plant communities by exotic perennial grasses. Notice of final determination as key threatening process. Accessed on 22 April 2008 from: www.environment.nsw.gov.au/determinations/ExoticPerennialGrassesKTPListing.htm

NSW Scientific Committee (2006). Invasion, establishment and spread of *Lantana camara*. Notice of final determination as key threatening process. Accessed on 22 April 2008 from: www.environment.nsw.gov.au/determinations/LantanaKtp.htm

NSW Scientific Committee (2007). Lowland Rainforest in NSW North Coast and Sydney Basin Bioregion – endangered ecological community. Accessed on 22 April 2008 from: www.environment.nsw.gov.au/determinations/LowlandRainforestEndCom.htm

Nymboida Shire Council (1986). *Local Environment Plan*

Riddler, A.M. & Hawkin, C.A. (1981). *Soil Landscapes in the Clarence Valley*. Soil Survey Bulletin 6 produced by the Biological and Chemical Research Institute. NSW Department of Agriculture, Rydalmere

Scotts, D. (2003). *Key Habitats and Corridors for Forest Fauna: A landscape framework for conservation in north-east New South Wales*. Occasional Paper No 32. NSW National Parks and Wildlife Service, Hurstville

Veness & Associates (1994). *Soils Report Grafton Forest Management Area*. *Supporting Document No. 3 for Grafton Management Area Environmental Impact Statement*. State Forests of NSW, Pennant Hills