CORAMBA NATURE RESERVE

PLAN OF MANAGEMENT

National Parks and Wildlife Service

Part of the Department of Environment and Climate Change NSW

July 2008

This plan of management was adopted by the Minister for Climate Change and the Environment on 21st July 2008.

Acknowledgments

This plan of management is based on a draft plan prepared by staff of the North Coast Region of NPWS.

Valuable information and comments were provided by NPWS specialists, the Regional Advisory Committee and members of the public.

Inquiries about this reserve or this plan of management should be directed to the NPWS Coffs Coast Area Office at 32 Marina Drive (PO Box J200), Coffs Harbour, NSW 2450 or by phone on (02) 66520 900.

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FOREWORD

Coramba Nature Reserve covers an area of 9.43 hectares and is located approximately 10 kilometres north-west of Coffs Harbour and 2.5 kilometres north of Coramba.

Coramba Nature Reserve was reserved to protect one of the few remaining stands of lowland rainforest along the Orara River. 'Lowland Rainforest on floodplain in the North Coast bioregion' is listed as an Endangered Ecological Community under the *Threatened Species Conservation Act 1995*.

Coramba Nature Reserve is an island remnant of native vegetation in an otherwise highly modified floodplain. While disturbed in parts, the lowland rainforest in the reserve generally comprises a closed canopy forest characterised by high species richness and structural complexity. A successful rainforest regeneration program and weed control program has been carried out which has enhanced the natural values of the reserve.

The reserve forms part of a critical regional habitat corridor, known as the Orara Valley Corridor. Focal species for this corridor include the rufous bettong, yellow-bellied glider and long nosed potoroo.

The New South Wales *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 an area will be managed in the years ahead.

A draft plan of management for Coramba Nature Reserve was placed on public exhibition from 4th June until 20th September 2004. The submissions received were carefully considered before adopting this plan.

This plan contains a number of actions to achieve "Better environmental outcomes for native vegetation, biodiversity, land, rivers, and coastal waterways" (Priority E4 in the State Plan) including continuation of rainforest regeneration and weed control programs, liaison to maintain and improve water quality and flow and conservation of key fauna corridors, and actions for the recovery of threatened species.

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

Verity Firth
Minister for Climate Change and the Environment

1. MANAGEMENT CONTEXT

1.1 LEGISLATIVE AND POLICY FRAMEWORK

The management of nature reserves in NSW is in the context of a legislative and policy framework, primarily the *National Parks and Wildlife Act 1974* (NPW Act), the *Threatened Species Conservation Act 1995* (TSC Act) and the policies of the National Parks and Wildlife Service (NPWS). Section 72AA of the NPW Act lists the matters to be considered in the preparation of a plan of management. The policies arise from the legislative background, the NPW Regulations and internationally accepted principles of park management. They relate to nature conservation, Aboriginal and historic heritage conservation, recreation, commercial use, research and communication.

Other legislation, international agreements and charters may also apply to management of the area. In particular, the *Environmental Planning and Assessment Act 1979* (EPA Act) requires the assessment and mitigation of environmental impacts of any works proposed in this plan.

A plan of management is a statutory document under the NPW Act. Once the Minister has adopted a plan, no operations may be undertaken within Coramba Nature Reserve except in accordance with the plan. The plan will also apply to any future additions to the nature reserve. Where management strategies or works are proposed for the nature reserve or any additions that are not consistent with the plan, an amendment to the plan will be required.

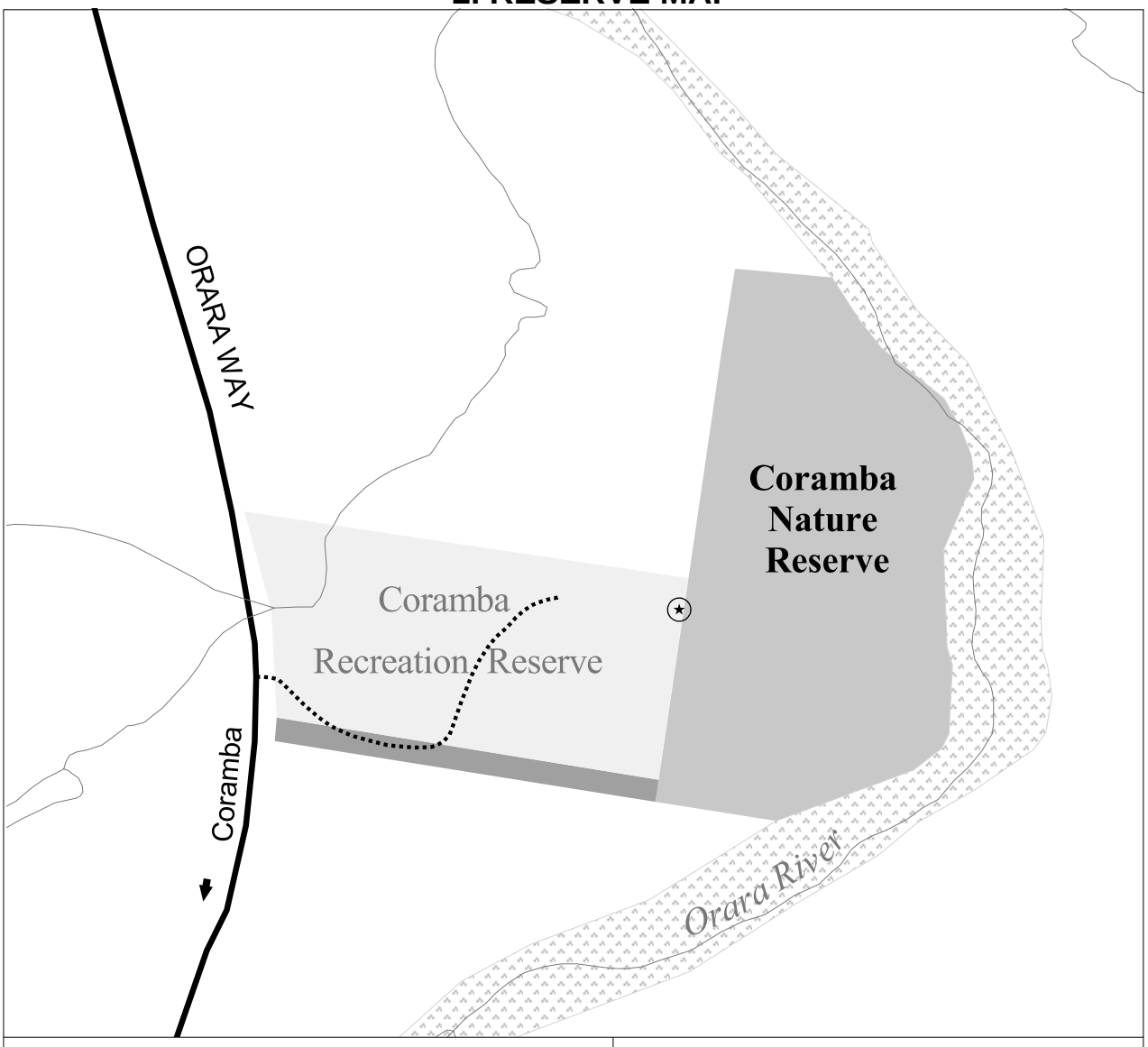
1.2 MANAGEMENT PURPOSES AND PRINCIPLES

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

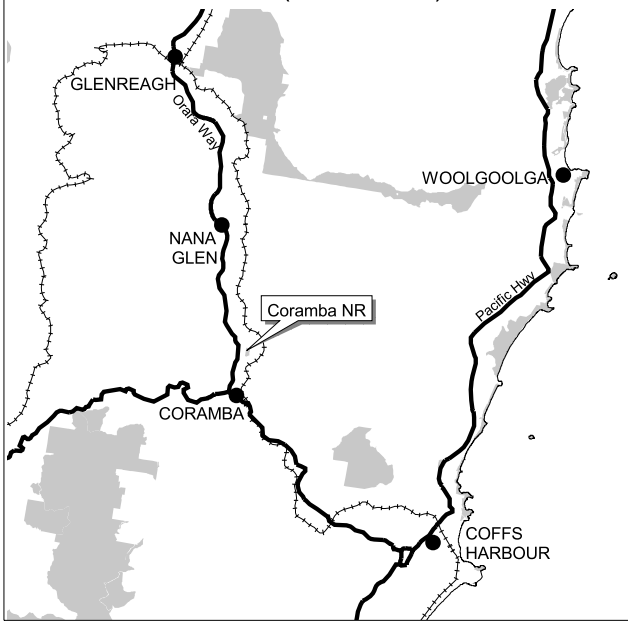
Under the Act, nature reserves are managed to:

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

2. RESERVE MAP



Location of reserve (not to scale)



Legend

- NPWS Estate
- Coramba Recreation Reserve
- Crown reserve along Orara River
- Unformed Public Crown Road
- Locality
- Intepretation Panel
- Railway line
- Watercourse

Access roads

- Main Road
- Private vehicular track

N W E S

0 100 200 300 Metres

3. CORAMBA NATURE RESERVE

3.1 LOCATION, RESERVATION AND REGIONAL SETTING

Coramba Nature Reserve (30º12' S, 153º01' E) (referred herein as 'the reserve') is located approximately 10 kilometres north west of Coffs Harbour and 2.5 kilometres north of Coramba, within the bounds of the Gumbaynggirr Aboriginal people, on the mid north coast of NSW (see Map). The reserve name is taken from the nearby town of Coramba which is derived from the local Aboriginal Gumbaynggirr name for the mountain (Gumbular Julipi Elders Group 2005). The reserve is within the Coffs Harbour Local Government Area.

The reserve was originally set aside for the "preservation of native flora" in 1900. In August 1982 it was officially reserved as a nature reserve and covers a total area of 9.43 hectares.

The reserve lies on the alluvial flats of the western bank of the Orara River, adjoining the Coramba Recreation Reserve and is surrounded by freehold rural landholdings predominantly used for cattle grazing on improved pastures. The bed of the Orara River is Crown Land.

The reserve, although small, is of high conservation value as it contains one of only a few remaining stands of lowland rainforest along the Orara River. 'Lowland Rainforest on floodplain' is listed as an endangered ecological community under the TSC Act.

3.2 LANDSCAPE CONTEXT

Coramba Nature Reserve forms a critical part of a Regional Habitat Corridor, known as the Orara Valley Corridor, linking Bagawa/Nana Creek State Forests and Lower Bucca State Forest (Scotts 2003) (refer Native Plants and Animals).

Natural and cultural heritage and on-going use are strongly inter-related and together form the landscape of an area. Much of the Australian environment has been influenced by past Aboriginal and non-Aboriginal land use practices, and the activities of modern day Australians continue to influence bushland through recreational use, cultural practices, the presence of introduced plants and animals and in some cases air and water pollution.

The geology, landform, climate and plant and animal communities of the area, plus its location, have determined how it has been used by humans. Such uses included Aboriginal harvesting and use of the resources present in the floodplain rainforest, and then logging, clearing, grazing and recreation after European settlement.

Both Aboriginal and non-Aboriginal people place cultural values on natural areas, including aesthetic, social, spiritual, recreational and other values. Cultural values may be attached to the landscape as a whole or to individual components, for example to plant and animal species used by Aboriginal people. This plan of management aims to conserve both natural and cultural values. For reasons of clarity and document usefulness natural and cultural heritage, non-human threats and on-going use are dealt with individually, but their inter-relationships are recognised.

3.3 NATURAL AND CULTURAL HERITAGE

Geology, Landform, Soils and Hydrology

The reserve is located approximately 90 metres above sea level on the alluvial flats of the Orara River, which is a sub catchment of the Clarence River.

The reserve lies on Quaternary clayey, silty and gravelly alluvials, with layered gravels, cobbles and stones in some soils. The alluvial soils are highly erodible and the sands have a tendency to be strongly acidic and low subsoil fertility (Milford 1999).

Soils in the reserve are subject to a high water erosion hazard with stream bank erosion being evident along the western boundary of the reserve which forms the active bank of the Orara River. The reserve is subject to periodic flooding and is poorly drained, with the watertable being close to the surface. A natural drainage channel traverses the reserve, and relief is generally less than 10 metres.

Native Plants

The reserve conserves one of only a few remaining stands of lowland rainforest along the Orara River and the only patch of lowland subtropical rainforest with white Booyong (*Hertitiera trifoliolata)* suballiance in the Clarence Valley (ECOSENSE 1992). Within this alliance occurs a riverine fringing strip of flood tolerant species belonging to the suballiance pepperberry *(Cryptocarya obovata)* - giant stinging tree (*Dendrocnide excelsa)* - *Ficus* spp – *Araucaria, a*s classified by Floyd 1990 and NPWS 1998.

The lowland rainforest is listed as a Schedule 1 endangered ecological community, ‘Lowland Rainforest on floodplain in the North Coast bioregion’. Lowland rainforest on floodplains cover less than 1000 hectares in NSW with remaining stands being small and isolated. In 1992 a Commonwealth grant to the Clarence Environment Centre enabled the preparation of a report on the conservation significance of rainforest remnants in the reserve. The study found that the reserve contains one of the best stands of turnip wood (*Akania lucens)* in the Clarence Valley. *Akania lucens* is the only species in the family *Akaniaceae* that is restricted to Australia (ECOSENSE 1992).

While disturbed in parts, the lowland rainforest in the reserve generally comprises a closed canopy forest characterised by high species richness and structural complexity. A successful rainforest regeneration program and weed control program has been carried out which has enhanced the natural values of the reserve (refer Introduced Plants and Animals).

The reserve represents an island remnant of native vegetation in an otherwise highly modified floodplain. Its long-term viability would benefit from the planting of suitable species in the vicinity of the reserve which could provide protection from edge effects of drying winds, weed invasion and enhance the general conservation values of the reserve.

The NPWS Key Habitats and Corridors project (Scotts 2003) identifies Coramba Nature Reserve as forming a critical part of a regional habitat corridor, known as the Orara Valley Corridor, linking Bagawa/Nana Creek State Forests and Lower Bucca State Forest. This corridor was mapped as linking habitats for fauna of the 'Wet Escarpment-Foothills' assemblage as well as fauna of the 'Moist escarpment-Foothills' assemblage (refer Native Animals).

Protection of vegetated remnants and rehabilitation of areas within the Orara Valley corridor are considered crucial for the long-term conservation of remnant vegetation and wildlife. Revegetation associated with the reserve or within the corridor surrounding the reserve is therefore important.

Native Animals

There has been no systematic survey of fauna undertaken, however the vulnerable rose crowned fruit dove (*Ptilinopus regina)* and grey-headed flying-fox *(Pteropus poliocephalus)* have been sighted within the reserve (ECOSENSE 1992).

The reserve provides an important source of food and shelter for migratory and resident fruit eating birds, including the rose crowned fruit dove, the common white headed pigeon (*Columba leucomela)*, brown cuckoo dove (*Macropygia amboinensis)*, figbirds (*Sphecotheres viridis)* and noisy pittas (*pitta versiocolor*) (ECOSENSE 1992).

The reserve forms part of a critical regional habitat corridor, known as the Orara Valley Corridor (refer Native Plants) (Scotts 2003). Focal species for this corridor include the rufous bettong, yellow-bellied glider and long nosed potoroo. The reserve and the corridor are mapped ‘key habitat’ for fauna of the 'Wet Escarpment-Foothills' and ‘Moist escarpment-Foothills’ assemblages. As such the area is predicted (by fauna models developed for Upper North CRA) to potentially include habitat for threatened species. Surveys are required to determine their occurrence in the reserve (see table 1). Species belonging to these assemblages are considered a priority for conservation because they are threatened, vulnerable to threatening processes or largely endemic to the north-east NSW region (Scotts 2003).

Table 1. Threatened fauna species known to occur in lowland rainforest on floodplains (Scotts 2003).

Scientific Name	Common Name	Status
Reptiles		
Hoplocephalus stephensii	Stephens Banded Snake	Vulnerable
Birds		
Ptilinopus magnificus	Wompoo fruit dove	Vulnerable
Ptilinopus regina	Rose crowned fruit dove	Vulnerable
Mammals		
Dasyurus maculatus	Spotted-tailed quoll	Vulnerable
Kerivoula papuensis	Golden-tipped bat	Vulnerable
Miniopterus australis	little bent-wing bat	Vulnerable
Nyctimene robinsoni	Eastern tube-nosed bat	Vulnerable
Potorous tridactylus	Long-nosed potoroo	Vulnerable
Syconycteris australis	Eastern/common blossom bat	Vulnerable
Thylogale stigmatica	Red-legged pademelon	Vulnerable
Pteropus poliocephalus	Grey-headed flying-fox	Vulnerable

Source: NSW Scientific Committee (1998).

In addition to those vertebrate species listed above lowland rainforest communities are also known to possess an extremely rich insect fauna (NSW Scientific Committee 1998).

Vegetated private lands surrounding the reserves are vital to the connectivity of fauna habitats in the region.

Aboriginal Heritage

The park is located within the country of the Gumbaynggirr Aboriginal people and the Coffs Harbour Local Aboriginal Land Council Area. Coramba is derived from the Gumbaynggirr dialect. The reserve is within the Gumbaynggirr known area of the Burrigarriga Plains which was used traditionally for various purposes such as camping, meeting and resource use (Gumbular Julipi Elders Group 2005).

Eugene Rudder, an early settler of the Orara Valley, documented some information on Aboriginal occupation in the vicinity of the reserve at the time of European settlement, and published notes on the local language (Yeates 1990). While there are no recorded Aboriginal sites on the reserve, there are a number recorded within the surrounding area including an open campsite and mythological site. As it is likely that the rainforest and the Orara River were a rich source of food and materials for Aboriginal people, it is possible that future surveys could identify sites within the reserve itself.

In the late 1880s, Eugene Rudder organised a sports day for local Aboriginal people at the site of what is now the Coramba Recreation Reserve adjacent to the nature reserve. It was estimated that approximately 600 Aboriginal people attended. This area of open grassland was reported at the time to have been called ‘Barrigarriga’ by the local tribe (Yeates 1990).

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

Historic Heritage

The first Europeans to arrive in the region in the mid 1800s were the cedar getters who worked their way up the Orara River and reached Coramba in 1875. This in turn opened up the way for land selection in the area (Yeates 1990).

The discovery of gold around Coramba in 1895 led to the establishment of a number of mines, many of which were in close proximity to the reserve such as Speculation, Korara and Coramba Queen gold mines. The discovery of gold also resulted in demand for food and other resources to supply the mining community and led to further development of agriculture in the area.

The reserve was originally set aside for a “camping reserve” in 1880. In 1900 the Government set aside reserves for the “preservation of native flora”. There is a long history of community support for the reserve and use of the neighbouring sports ground. Following representation by the Ulitarra Conservation Society it was officially reserved as a nature reserve in August 1982.

Officially there have been no recorded non-Aboriginal heritage items within the reserve, however NPWS have been informed that antique bottles dating back to the 1880s have been found in the reserve (Gumbular Julipi Elders Group 2005).

3.4 VISITOR USE AND EDUCATION

Access to Coramba Nature Reserve is via the Coramba Recreation Reserve and is at the discretion of the Reserve Trust (Coffs Harbour Council). Legal access is also theoretically available via an unformed Crown Public Road from Orara Way along the southern boundary of the Recreation Reserve (see map). The Recreation Reserve includes sports oval, club house and toilet facilities and is managed by the Coffs Harbour City Council. The western vegetated buffer, boundary fence, main access and interpretive signage are located within the Recreation Reserve and are subject to the statutory requirements of the *Crown Lands Act 1989*. Other than a basic unformed walking track, which traverses Coramba Nature Reserve, there are no visitor facilities in the nature reserve. The track maintains a 'fluid' nature and moves around new disturbances such as tree branches or new regeneration sites. Due to low visitation levels, the fluid track has minimal effects on the vegetation and soil. Some sections of the track are used for access to current bush regeneration sites and are therefore only temporary.

NPWS has not promoted general recreational use of the reserve because of its small size and potential visitor impacts on the endangered lowland rainforest community.

Recreational activities not consistent with the study of nature and natural environments are generally considered inappropriate uses of a nature reserve. The reserve currently receives low levels of use for appropriate passive recreation such as nature study and bird watching. There is also some minor “spill over” visitation to the reserve when sporting activities and/or events occur on the adjacent Recreation Reserve. Some minor littering associated with use of the adjoining area also occurs**.**

High visitor numbers and inappropriate recreation activities on the reserve may result in damage to the sensitive lowland rainforest vegetation and other conservation values of the reserve. As a nature reserve, use and recreational activities should focus on the education of visitors and appreciation of the natural and cultural heritage of the reserve. However, even for these appropriate activities, the values of the reserve could be threatened by any significant increase in visitor numbers.

3.5 THREATS TO RESERVE VALUES

Introduced Plants and Animals

The North Coast Region Pest Management Strategy (NPWS 2002a) broadly identifies the weed and feral animal issues for the reserve. The significant conservation values, small size and isolation of this lowland riverine subtropical rainforest remnant prompted the NPWS to develop a specific restoration program, incorporating a weed control strategy (NPWS 1998) for the reserve. A total of 14 weed species were identified, several of which were identified as constituting a current or potentially serious threat to native vegetation.

The major weeds of concern identified in the restoration program and weed control strategy for the reserve include trad (*Tradescantia fluminensis*); large-leaved privet (*Ligustrum lucidum*); small-leaved privet (*L. sinense*); camphor laurel (*Cinnamomum camphora*); and cats claw creeper (*Macfadyena unguis-cati*). The privet infestations are concentrated around the edges of the remnant forest and along the riverbank (NPWS 1998).

The primary aim of the restoration program developed for the reserve is to re-establish the species composition, structure and ecological processes of a mature forest. Following the recommendations of the strategy, a successful rainforest regeneration program has been undertaken. The program has had a major impact on the control of weeds in the reserve, encouraging the restoration of the native vegetation. Continual maintenance is needed to prevent reinfestation of weed species and encourage further regeneration of native plant species. The NPWS has also encouraged weed control assistance from students undertaking the Bushland Regeneration course at the local TAFE.

The Regional Pest Management Strategy does not identify introduced animals as a problem within the reserve, however, fox dens have been observed and control undertaken in cooperation with Landcare. Cats have also been reported as occurring in the reserve. There have been some problems with cattle entering the reserve from neighbouring properties. The cattle have created a myriad of tracks and damaged the vegetation. Fencing on some boundaries and compliance from neighbours across the river should address this problem.

The reserve's small size and isolation from other vegetated areas makes it continually vulnerable to impacts from introduced plant and animals.

Fire

The NPWS regards fire as a natural phenomenon and one of the continuing physical factors influencing the Australian environment. Inappropriate fire regimes have been identified as a key threatening process affecting the biological diversity of NSW.

There has been no recorded wildfire within the reserve since recording commenced in 1946. The rainforest vegetation in the reserve is sensitive to fire and its presence indicates that no fire event has occurred in the reserve for a very long time. Fires are likely to cause the rainforest to retract, change species composition, and significantly impact on the rare rainforest assemblage (Schedule 1 endangered ecological community, 'Lowland Rainforest on floodplain in the North Coast bioregion').

There are a number of assets which border the reserve with the main ones being the clubhouse, fences and sheds of the Coramba Recreation Reserve to the west. A 200 metre wide pasture buffer and the moist vegetation types, which are not conducive to the spread of fire, protect the clubhouse, fences and recreation grounds.

A recent review of fire management throughout the NPWS has resulted in a modified approach to fire based on the level of complexity involved. In regard to Coramba Nature Reserve, the NPWS considers that it is appropriate to include the specific fire management strategies for the reserve into this plan of management. Programs are also submitted to the district Bush Fire Management Committees.

The NPWS approach to fire management planning uses a system of zones for bushfire management in NPWS reserves. These zones are compatible with the system adopted by the district bushfire risk management plans.

NPWS has assessed the reserve for fire management planning purposes and has zoned the reserve as a Heritage Management Zone (HAMZ). It is considered that there is a low risk of fire in the reserve. The primary fire management objectives within this zone are to

prevent the extinction of all species that are known to occur naturally within the reserve, and to protect culturally significant Aboriginal and non-Aboriginal sites. The reserve has been designated as a HAMZ because it is not adjacent to built assets which would be exposed to a high level of bushfire risk, does not have a history of bushfire ignitions or known areas of high bushfire behaviour potential. The HAMZ does not require intensive management and focuses on those actions appropriate to conserve biodiversity and cultural heritage including exclusion of fire from the reserve.

NPWS maintains cooperative arrangements with surrounding landowners and RFS brigades and is actively involved in the Coffs Harbour Bush Fire Management Committee. Cooperative arrangements include approaches to fuel management, support for neighbours fire management efforts and information sharing.

Isolation and Fragmentation

Clearing of vegetation within the bioregion has not only resulted in loss of biodiversity but also fragmentation of habitat. Long term conservation of biodiversity both within the bioregion and locally within the reserve depends upon protection, enhancement and connection of remaining habitat across the landscape, involving public and private land remnants.

The reserve's small size and isolation from other naturally vegetated areas means it is continually under threat from weed reinfestation. It is also vulnerable to natural disturbance such as storms, which can reduce canopy cover, increase sunlight penetration and favour non-rainforest species. This together with the edge effects such as drying winds may result in a change in the rainforest ecosystem of the reserve.

The small, isolated and fragmented nature of the reserve also has a marked effect on the resident population of native fauna. If rainforest vegetation in the reserve retracts in size the diversity of the resident rainforest fauna may also decline.

Flood Events

Since European settlement, land use practices have resulted in clearing and erosion throughout the Orara River sub catchment. Such activities have altered the natural hydrological processes, and are likely to have affected the velocity of floodwaters and the rate of sedimentation in the reserve. Flood events can result in damage to vegetation, including revegetated areas, reinvasion of existing weeds or new weed species and bank erosion. During flooding there is also deposition of silt and litter.

4. MANAGEMENT ISSUES AND STRATEGIES

Current Situation	Desired Outcomes	Strategies	Priority
Soil and water conservation The reserve is located within a floodplain and is periodically flooded causing bank erosion, introduction of weeds, rubbish and damage to native vegetation.	• Soil erosion is minimised. • The effects of flooding on reserve values are minimised.	• Undertake all works in a manner that minimises erosion and water pollution. • Monitor the stream bank erosion and if required, in conjunction with Orara River Care groups, take action to arrest erosion. • Liaise with Coffs Harbour City Council and other relevant authorities to maintain and improve water quality and flow in the reserve's catchments. • Continue to undertake the revegetation and weed control program within the reserve (refer to Native plant and animal conservation and Introduced species).	High High Ongoing High/ Ongoing
Native plant and animal conservation The reserve contains 'lowland rainforest on floodplain', which is listed as an endangered ecological community under the TSR Act and is one of only a few remaining stands along the Orara River. A successful rainforest regeneration program has been implemented for the reserve. Weeds are the major threat to plant diversity within the reserve. The vulnerable rose crowned fruit dove and grey headed flying fox occur in the	• All native plant and animal species and communities are conserved. • Structural diversity and habitat values are restored in areas subject to past and continuing disturbance. • Increased knowledge of fauna on the reserve and their ecological	• Continue ongoing rainforest regeneration and weed control programs to re-establish species composition, structure and ecological processes of the rainforest (refer Introduced Species). • Monitor vegetation recovery. • Undertake plant and animal surveys, particularly for rare and threatened species. • Implement measures included in recovery plans for any threatened species when prepared. • Work with neighbours, relevant authorities and vegetation management committees to encourage conservation of remnant native vegetation in the vicinity of the reserve through appropriate	High/ Ongoing Ongoing Medium High High

reserve. Although no animal surveys have been undertaken the reserve may provide an important habitat to a range of riverine and rainforest species.	requirements. • Conservation and corridor values of the reserve are enhanced by retention of vegetated areas on adjacent private land.	conservation mechanisms, particularly in those areas identified as forming corridors or containing key habitat for fauna (Scotts 2003). • Promote, support and encourage volunteer bush regeneration activities. • Liaise with Coffs Harbour City Council and reserve neighbours on the land immediately adjacent to the reserve about the creation of a native vegetation buffer.	High High
Cultural heritage There are no recorded indigenous or non-indigenous cultural heritage sites within the reserve. No surveys have been undertaken. The reserve lies within the country of the Gumbaynggirr Aboriginal Nation and within the Coffs Harbour LALC area. The reserve name is derived from the Gumbaynggirr dialect and is the name for the mountain (Yeates, 1990).	• Any cultural features are identified, recorded, conserved and managed in accordance with their significance. • The history of the reserve documented and recorded. • Increased involvement of the local Aboriginal community in cultural heritage management of the reserve.	• Protect and manage Aboriginal heritage values associated with the reserve in partnership with the local Aboriginal community including the Coffs Harbour Aboriginal Land Council (LALC), Gumbaynggirr Elders and any other relevant individuals. • Encourage studies into the reserve's cultural heritage including formal documentation of cultural resources and locations. Ensure information on the reserve's Aboriginal cultural heritage is not presented to the public without the permission of the local Aboriginal community.	Ongoing Ongoing

Visitor use and education Use of the reserve must be carefully managed since it is a relatively small and significant area of remnant vegetation. Access is via foot and generally from the western side through the adjoining Coramba Recreation Reserve. There are no recreational facilities within the reserve other than an informal walking track.	• The local community is aware of the significance of the area and of management programs. • Walking access is provided for the public to and in the reserve. • Visitor use remains low and is ecologically sustainable.	• Allow nature appreciation activities such as walking, bird watching, nature study and nature based commercial operations only. • Recreational use of the reserve will not be promoted. Prohibit camping, vehicle use, horse riding, adventure activities and cycling. • Maintain the existing walking track through the reserve as a Basic Track (Australian Standard Class 4. No other facilities other than signage at the reserve entrance will be provided (refer below). • Liaise with Coffs Harbour City Council about ensuring public access to the reserve through the Coramba Recreation Reserve. • Promote community understanding and appreciation of the conservation values of the reserve through contact with neighbours, community organisations and media releases as needed. • Install interpretive and regulatory signage at the entrance to the reserve.	Ongoing High High High Ongoing Medium
Introduced species A restoration program, incorporating a weed control strategy, has been prepared for the reserve. The continuation of bush regeneration and weed control activities is vital to the ongoing conservation of this significant rainforest remnant. Major weed species include trad, privet; camphor laurel and	• Introduced species are controlled and were possible eradicated from the reserve. • The impact of introduced species on native species and neighbouring lands is	• Continue to implement the restoration program and weed control strategy for the reserve, including ongoing monitoring. • Undertake additional weed control after flood events to prevent reinfestation. • Undertake fox baiting as required. • Consult with and seek the cooperation of other authorities, the Aboriginal community and reserve	High Ongoing Medium Medium

cat's claw creeper. Other than occasional cattle entering the reserve and the existence of foxes across the landscape, introduced animals are not a major problem. The small size and isolation of the reserve makes it continually vulnerable to impacts from introduced species.	minimised.	neighbours in regard to the implementation of weed and pest animal control programs. • Fence the reserve boundary to a stock-proof standard to prevent cattle entering the reserve. • Undertake regular consultation with volunteers and bush regeneration teams involved in rehabilitation of the reserve to monitor the progress of introduced species programs.	High Low
Fire management There has been no recorded wildfire within the reserve since records began in 1946. The reserve is considered to have a very low risk of bushfire. The reserve has been designated as a HAMZ because of the sensitivity of the lowland rainforest community to fire. Natural and constructed barriers inhibit the likelihood and spread of fire from and into the reserve.	• Fire is excluded from the reserve. • Life, property and natural and cultural values within and adjacent to reserve are protected from fire. • The endangered vegetation within the reserve is protected from fire. • The potential for spread of bushfires on, from, or into the reserve is minimised.	• Manage the reserve as a Heritage Area Management Zone where fire is managed to protect biodiversity and protect fire sensitive communities. • Suppress all unplanned fires and where possible, exclude fire from the reserve. • Prohibit the lighting of fires. • Actively participate in Coffs Harbour District Bush Fire Management Committee. • Maintain coordinated and cooperative arrangements with Rural Fire Service brigades and neighbours with regard to fuel management and fire suppression works outside the reserve. • Liaise with Coffs Harbour City Council to ensure continued access for fire management purposes through the adjoining Coramba Recreation Reserve. • Support neighbours' efforts to contain fire on their own properties, protect their own assets and report unplanned ignitions. • Provide information and advice to neighbours	High High Ongoing /High Ongoing High High/ Ongoing High

		regarding the ecological impact of fire and fire management issues. • Negotiate with neighbours to enable the clearance of firebreaks on private land where necessary for the mutual protection of the nature reserve and private property values from wildfire. Consider potential impacts on the reserves values when locating firebreaks.	High/ Ongoing
Research Scientific study is needed to improve understanding of the reserve's natural and cultural heritage, the processes that affect them and the requirements for management of particular species. Research to date has focused on monitoring of the bush regeneration project. and includes data on a range of biological observations.	• Research enhances the management information base and has minimal environmental impact. • Processes and biological observations will continue to be recorded.	• Undertake and encourage research to improve knowledge and management of natural and cultural heritage. • Encourage and guide research by educational organisations and others in the reserve into the following areas: - fauna surveys and ecological studies; - Aboriginal and European cultural Heritage; - bush regeneration practices in relation to lowland rainforest; - the effect of the stranger figs on the future plant diversity of the reserve; and - appropriate management of pest species.	Low Low

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.

REFERENCES

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