

YATTEYATTAH NATURE RESERVE
PLAN OF MANAGEMENT

NSW National Parks and Wildlife Service
September 2002

This plan of management was adopted by the Minister for the Environment on 26th September 2002.

Acknowledgments

This plan of management was prepared by staff of South Coast Region and the Conservation Management Unit with the assistance of specialists in Southern Directorate and Head Office. Members of the former Nowra District Advisory Committee, neighbours and interested community members contributed to the plan.

Cover photo of Yatteyattah Nature Reserve by Michael Van Ewijk.

NSW National Parks and Wildlife Service

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FOREWORD

Yatheyattah Nature Reserve is located on the South Coast of NSW between Nowra and Milton, 2.5 km west of Conjola Lake. It was gazetted in 1996 and has an area of 19 ha.

The reserve protects the main southern occurrence of subtropical rainforest, the southern limit of *Ficus-Streblus-Dendrocnide-Cassine* dry rainforest sub-alliance and several native plant species that are regionally rare or at their southern limit. It also includes areas of forest red gum *Eucalyptus tereticornis* and thin-leaved stringybark *E. eugenioides*, both of which are poorly represented in conservation reserves.

The reserve contains one of the most southerly roosting and maternity sites for the grey-headed flying-fox *Pteropus poliocephalus*. It provides habitat for several uncommon birds including the threatened powerful owl *Ninox strenua* and is an important food source for nomadic fruit-eating birds, some of which are at their southern limit of distribution.

Because of its small size and significance, management emphasis in the reserve will be on maintenance of its ecological integrity and habitat values. Weed control and monitoring, regeneration of previously disturbed areas and fauna surveys will be the main management programs in the foreseeable future.

Public use of the reserve will be allowed for educational purposes but limits may be placed on numbers, group sizes and visits to the flying-fox camp. The impacts of public use will be monitored.

This plan of management contains the scheme of operations for Yatheyattah Nature Reserve. In accordance with section 76 of the *National Parks and Wildlife Act 1974*, this plan of management is hereby adopted.

BOB DEBUS
MINISTER FOR THE ENVIRONMENT

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1. INTRODUCTION

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

The procedures for the adoption of a plan of management for a nature reserve are specified in the Act:

- * The Director-General is required to refer the plan to the National Parks and Wildlife Advisory Council for its consideration and advice.
- * The Director-General is required to submit the plan to the Minister, together with any comments or suggestions of the Advisory Council.
- * The Minister may adopt the plan without alteration or with such alterations as the Minister may think fit, or may refer it back to the Director-General and Council for further consideration.

Once a plan has been adopted by the Minister, no operations may be undertaken within the nature reserve except in accordance with the plan.

Although not a requirement under the Act, this plan of management was placed on public exhibition for three months from 3rd August until 12th November 2001. The exhibition of the plan of management attracted 10 submissions which raised 9 issues. All comments received were referred to the Advisory Council with the plan when their consideration and advice to the Minister.

The planning process leading to the development of this plan involved the collection and use of a large amount of information, which for reasons of document size, has not been included in the plan. For additional information or enquiries on any aspect of the plan or Yattayattah Nature Reserve, contact the Service's South Coast Region Office at 55 Graham Street, Nowra or by phone on (02) 4423 2170.

2. MANAGEMENT CONTEXT

2.1 NATURE RESERVES IN NEW SOUTH WALES

Nature reserves in New South Wales arose out of faunal reserves. Faunal reserves were first established under the *Fauna Protection Act 1948*. Under the *National Parks and Wildlife Act 1967*, faunal reserves were reclassified as nature reserves. The 1967 Act was subsequently replaced by the *National Parks and Wildlife Act 1974*.

Under the National Parks and Wildlife Act, nature reserves are areas of special scientific interest containing wildlife or natural environments or natural phenomena.

The purposes of nature reserves are defined in the Act as:

- "(a) the care, propagation, preservation and conservation of wildlife;
- (b) the care, preservation and conservation of natural environments and natural phenomena;
- (c) the study of wildlife, natural environments and natural phenomena; and
- (d) the promotion of the appreciation and enjoyment of wildlife, natural environments and natural phenomena.

Nature reserves are valuable refuge areas, where natural processes, phenomena and wildlife can be studied. They differ from national parks which include as a major objective the provision of appropriate recreation opportunities.

2.2 YATTEYATTAH NATURE RESERVE

2.2.1 Location, Gazettal and Regional Setting

Yatteyattah Nature Reserve is located on the South Coast of NSW, 8 km north of Milton and 2.5 km west of Conjola Lake (see summary map). It was gazetted in 1996 and has an area of 19 ha. The reserve was formerly an area of Crown land reserved as Yatteyattah Recreation Reserve.

The reserve is surrounded largely by agricultural land (some of which supports remnant rainforest) but there are extensive areas of national park and state forest nearby. The district is a popular holiday location, with visitor facilities in Morton and Cudmirrah National Parks and nearby towns such as Sussex Inlet, Lake Conjola, Milton and Ulladulla.

2.2.2 Importance of Yatteyattah Nature Reserve

Yatteyattah Nature Reserve protects a small patch of lowland subtropical and dry rainforest, remnant from the formerly more extensive areas of rainforest on volcanic soils in the Milton area. The subtropical rainforest is classified by Floyd 1990 as suballiance *Doryphora-Daphnandra-Dendrocnide-Ficus-Toona* and is the main, relatively undisturbed southern occurrence. Areas further south are less well developed and have fewer species. The dry rainforest at Yatteyattah is suballiance *Ficus-Streblus-Dendrocnide-Cassine*, which is at its southern limit.

The rainforest of the reserve differs markedly from nearby areas of warm temperate rainforest on the escarpment and closer to the coast. It is a southerly outlier of subtropical rainforest - the nearest being 70 km to the north at Cambewarra Mountain -

and is one of the most diverse rainforest areas in the south of the state. The area is unusual for its lack of the weed lantana *Lantana camara*, and the nature reserve generally has few areas of introduced species.

The Milton area is one of three critical areas in southern NSW where there are dramatic changes in the floristic diversity of rainforest (Mills, 1997). Nineteen plant species reach their southern limit in or near the reserve, in the rainforest or tall open forest. Those which are found in the nature reserve are red cedar *Toona ciliata*, pitted bluegrass *Bothriochloa decipens*, binung *Christella dentata*, *Cyperus enervis*, graceful sedge *C. gracilis*, *C. laevis*, *C. tetraphyllus*, pygmy panic *Panicum pygmaeum*, deciduous fig *Ficus superba* var. *henniana*, whalebone tree *Streblus brunonianus*, cockspur thorn *Maclura cochinchinensis*, pigeon berry ash *Elaeocarpus kirtonii*, round-leaf vine *Legnephora moorei* and polliia *Pollia crispata*.

Regionally rare species found in the reserve (Mills, 1988) are twin-flowered aneilema *Aneilema biflorum*, little gem sarcochilus *Sarcochilus hillii*, deeringia *Deeringia amaranthoides* and bangalow palm *Archontophoenix cunninghamiana*.

Small areas of forest red gum *Eucalyptus tereticornis* and thin-leaved stringybark *E. eugenoides* occur in the reserve. These species have been extensively cleared elsewhere and are poorly represented in reserves.

The reserve contains one of the most southerly roosting and maternity sites for a camp of the grey-headed flying-fox *Pteropus poliocephalus* (listed as vulnerable under the *Threatened Species Conservation Act 1995*). The grey-headed flying-fox is an important pollinator and seed disperser. Some trees are specifically pollinated by flying-foxes.

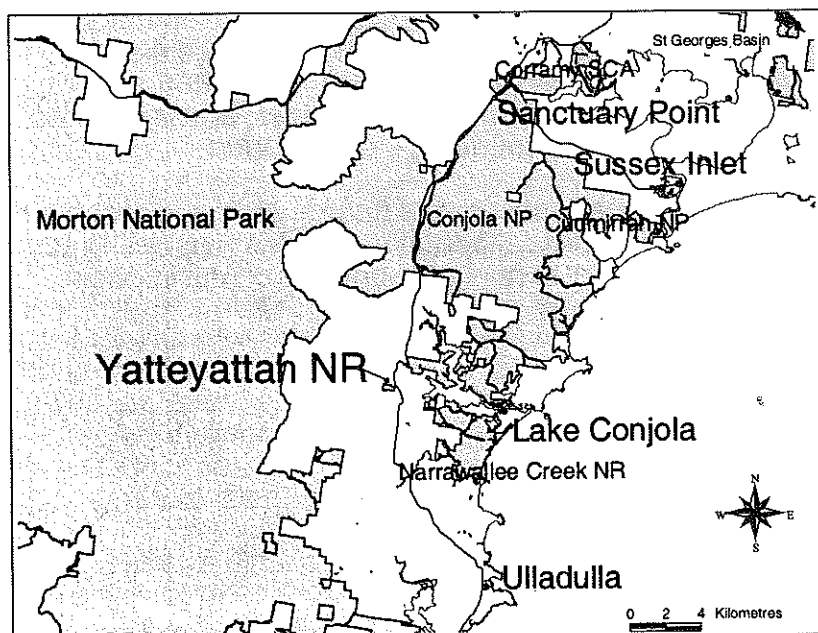
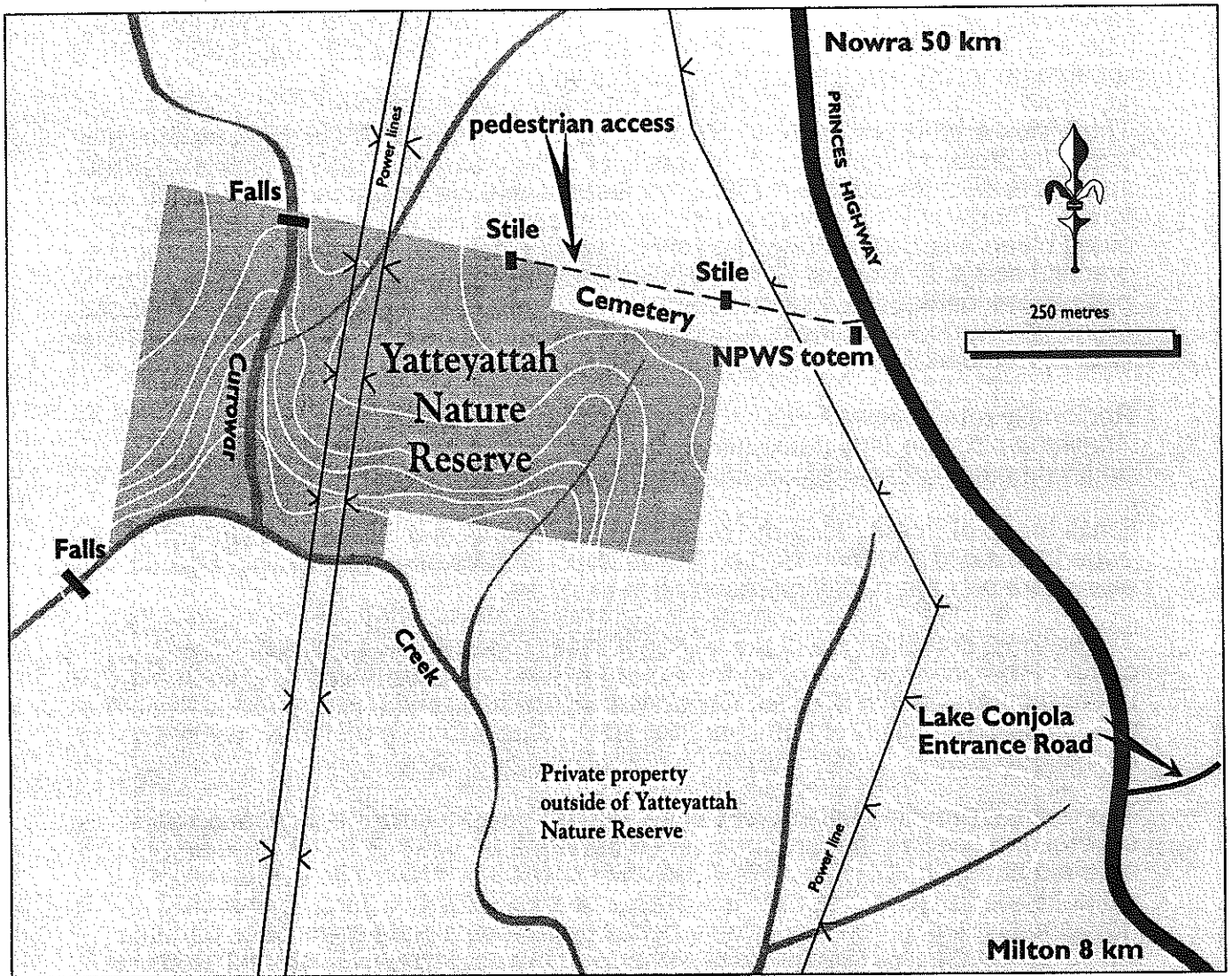
The reserve provides habitat for the threatened powerful owl *Ninox strenua* and several bird species that are uncommon or near their southern limit, including the emerald dove *Chalcophaps indica*, scarlet honeyeater *Myzomela sanguinolenta*, white-headed pigeon *Columba leucomela*, channel-billed cuckoo *Scythrops novaehollandiae*, green catbird *Ailuroedus crassirostris* and figbird *Sphecotheres viridis*. The latter four species are nomadic fruit-eating birds. Rainforest areas are highly fragmented on the south coast and remnants such as Yatteyattah are an important food source for these and other fruit-eating birds.

The reserve is of local historic interest as an area donated by a private landholder in the 19th century for public recreation and preservation of its natural values. Several historic features and a scarred tree are located in the reserve.

The rainforest, creeks and in particular the waterfalls, are very attractive and contrast dramatically with the surrounding cleared lands.

As a significant, rare and easily accessible natural area, the reserve has high educational and research values, although such uses must be in accordance with appropriate conditions in order to minimise environmental impacts.

Yatheyattah Nature Reserve



3. OBJECTIVES OF MANAGEMENT

3.1 GENERAL OBJECTIVES FOR NATURE RESERVES

The following general objectives relate to the management of nature reserves in New South Wales:

- * protection and preservation of scenic and natural features, including significant geological and geomorphological features;
- * conservation of wildlife, including maintenance of biodiversity and populations of threatened species;
- * maintenance of natural processes as far as is possible;
- * preservation of catchment values;
- * preservation of Aboriginal sites in consultation with the Aboriginal community;
- * conservation of non-Aboriginal historic features;
- * provision of opportunities for appropriate use; and
- * encouragement of scientific and educational enquiry into environmental features and processes.

3.2 SPECIFIC OBJECTIVES FOR YATTEYATTAH NATURE RESERVE

In addition to the above general objectives, the management of Yatteyattah Nature Reserve will be subject to the following specific objectives:

- * protection of Yatteyattah Nature Reserve as a southerly sample of subtropical rainforest and *Ficus-Streblus-Dendrocnide-Cassine* dry rainforest;
- * maintenance and regeneration of areas of forest red gum;
- * maintenance of habitat values for bird species that rely on rainforest;
- * protection of the grey-headed flying-fox colony and maternity site; and
- * promotion of visitor and community appreciation of the values of rainforest communities and of the high conservation and scientific significance of Yatteyattah.

3.3 OVERALL STRATEGY

The Yatteyattah rainforest is a small area with very high habitat and scientific values. The reserve will be managed as a scientific reference area and protected from disturbance. Management priority will be given to maintenance and enhancement of the natural values of the reserve through the following programs:

- control and, where practical, eradication of introduced plants, in conjunction with neighbours;

- monitoring for new weed infestations;
- control of introduced animal species where feasible, in conjunction with neighbours;
- maintenance of fencing to keep out stock and permit regeneration of partially cleared areas;
- monitoring of regeneration in the forest red gum community;
- monitoring of the flying-fox colony;
- further survey for native animal species;
- protection of the rainforest from fire; and
- maintenance of appropriate fire regimes in the eucalypt communities.

The reserve will be available for appropriate educational and public visits. Initially, no visitor facilities will be provided apart from walking access to the northern boundary and an interpretive shelter. A walking track may be established if needed to ensure visitors use appropriate routes through the reserve.

The Service will work closely with neighbours of the reserve regarding weed and pest control, fire management, wildlife management, access and fencing.

4. POLICIES AND FRAMEWORK FOR MANAGEMENT

This chapter contains the policies and framework for the management of Yatteyattah Nature Reserve together with relevant background information. Policies are summarised under the following section headings:

- 4.1 NATURE CONSERVATION
- 4.2 CULTURAL HERITAGE
- 4.3 USE OF THE AREA

Natural and cultural heritage and on-going use are presented individually for convenience and clarity. In practice, however, they 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 policies established in this plan of management provide the framework for future management of Yatteyattah Nature Reserve over the next five to ten years.

Where not specifically provided for in this plan, management of Yatteyattah Nature Reserve will be in accordance with the National Parks and Wildlife Act and with general Service policies.

4.1 NATURE CONSERVATION

Nature conservation covers all aspects of the natural environment including geology and soils, water quality, native plants and animals and the relationship between these. For convenience, management of landscape values, introduced species and fire are also considered in this section.

4.1.1 Landform, Geology, Soils and Water Quality

The nature reserve can be divided roughly into two topographic units - a gently sloping plateau along the northern half and steep south-facing slope along the southern half. The reserve drops into a narrow valley that provides shelter for its rainforest communities from westerly winds.

Currowar Creek flows through the western section of the reserve and joins an unnamed tributary creek that borders part of the southern boundary. A waterfall is located on Currowar Creek near the northern boundary, where the creek drops into a rocky gully. The tributary also has a waterfall and very attractive pool just west of the reserve. Both creeks are semi-permanent within the reserve. A smaller tributary of Currowar Creek rises in a gully at the eastern end of the reserve. The creeks flow into Narrawallee Creek and eventually Narrawallee Inlet.

The reserve is located primarily on an area of Milton Monzonite. Monzonite is an intrusive rock produced by localised volcanic-igneous activity in the Mesozoic era. Other areas of monzonite in the Milton district have been largely cleared for agriculture.

The lower slopes, particularly in the eastern half of the reserve, lie on sandstone of the Conjola Formation, which occurs extensively in the surrounding area.

The monzonite has formed shallow but fertile soils over most of the reserve. On the lower slopes the monzonite has enriched the soils formed on the Conjola Formation. Deep alluvial soils occur along the valley floor.

Volcanic soils are generally stable but sandstone soils are easily eroded. There is currently no observable erosion in the reserve but the steeply sloping valley sides and the soft soils of the creek banks could be eroded if disturbed by increased public use of the reserve.

The Environmental Protection Authority has undertaken water quality testing in Currowar Creek. Water quality is reasonable but high nutrient levels resulting from rural activities upstream of the reserve have the potential to cause algal growth. The reserve lies within the area of the Southern Catchment Management Board. The Service will work with the board to improve water quality in the nature reserve.

Policies

- * All works will be designed and undertaken in a manner that minimises soil erosion and avoids water pollution.
- * Where erosion is caused by human activity in the reserve or threatens significant habitats or other values, appropriate control measures will be undertaken.
- * The Service will work with the Southern Catchment Management Board, relevant authorities and neighbours to maintain and improve the water quality of Currowar Creek and its tributaries.

4.1.2 Native Vegetation and Introduced Plants

Broadly, the vegetation of the reserve consists of dry rainforest on the stony slopes, subtropical rainforest along Currowar Creek and tributary gullies, and eucalypt forest on the plateau. A comprehensive plant survey has been undertaken in the reserve and adjacent areas (Robinson and Bofeldt, 1997). The information below is taken largely from the survey report.

Areas supporting dry rainforest have shallow soils and greater exposure compared to the lower slopes with subtropical rainforest. Height and species vary according to past disturbance. Common trees include whalebone tree *Streblus brunonianus*, red cedar *Toona ciliata*, red-fruited olive plum *Cassine australis* and brush bloodwood *Baloghia inophylla*. Red ash *Alphitonia excelsa*, giant stinging tree *Dendrocnide excelsa*, myrtle ebony *Diospyros pentamera*, black plum *D. australis* and native quince *Alectryon subcinereus* are also widespread. Emergent small-leaved fig *Ficus obliqua* and Port Jackson fig *Ficus rubiginosa* are common in some areas. Small trees and shrubs include native olive *Notelaea longifolia*, brittlewood *Claoxylon australe*, tree violet *Hymenanchera dentata*, orange-thorn *Citriobatus pauciflora* and deeringia *Deeringia amaranthoides*. A variety of ferns, grasses and sedges form the ground cover, including giant maidenhair *Adiantum formosum*, rasp fern *Doodia aspera*, *Cyperus tetraphyllus* and rough saw-sedge *Gahnia aspera*. Common climbers include water vine *Cissus antarctica*, snake vine *Stephania japonica* var. *discolor* and sarsaparilla *Smilax australis*.

Predominate trees in the subtropical rainforest are brush bloodwood, brush cherry *Syzygium australe*, giant stinging tree, whalebone tree, churnwood *Citronella moorei*, myrtle ebony and emergent small-leaved figs. Other canopy trees include yellow ash *Emmenosperma alphitonioides*, native tamarind *Diploglottis australis*, red cedar, lilly pilly *Acmena smithii*, pigeon-berry ash *Elaeocarpus kirtonii*, sassafras *Doryphora sassafras* and brown beech *Pennantia cunninghamii*. Understorey trees and shrubs include sandpaper fig *Ficus coronata*, bolwarra *Eupomatia laurina* and

cabbage tree palm *Livistona australis*. Ferns are common in the subtropical rainforest, including giant maidenhair fern, shiny shield fern *Lastreopsis microsora*, sickle fern *Pellaea falcata* and epiphytes such as birds-nest fern *Asplenium australasicum*, elkhorn *Platycterium bifurcatum* and fragrant fern *Microsorium scandens*. Several climbers occur, including common silk-pod *Parsonsia straminea*, native pepper vine *Piper novae-hollandiae* and morinda *Morinda jasminoides*.

The rainforest has been disturbed in the past by felling trees to obtain epiphytes and clearing for adjacent power lines running north-south through the reserve. Along much of the power line route the rainforest has regenerated but the tree canopy is not allowed to regrow in some sections because of the potential for interference with the lines.

Open forest on the plateau is dominated by forest red gum *Eucalyptus tereticornis*. Other canopy trees are coast grey box *E. bosistoana* and thin-leaved stringybark *E. eugenioides*. The understorey is mainly grassy because of the influence of soil type, grazing and fire, and varies considerably. Rainforest species are found in the understorey in unburnt areas and particularly along Currowar Creek. Native understorey and ground cover species include tussock *Poa labillardieri*, drooping sedge *Carex longebrahiata*, weeping grass *Microlaena stipoides*, golden star *Hypoxis hygrometrica*, native raspberry *Rubus parvifolius*, native indigo *Indigofera australis*, black wattle *Acacia mearnsii* and occasional ferns and orchids.

The reserve boundaries on the plateau have been fenced to allow native understorey species to gradually re-establish and good regeneration is occurring. Photo points will be set up to monitor further recovery.

The plateau area has been completely cleared beneath the power lines. Section 4.3.3 provides for a maintenance arrangement that will permit low growing vegetation to regenerate along the power lines.

A small area of turpentine *Syncarpia glomulifera* and forest red gum occurs just inside the southern boundary of the reserve, surrounded by rainforest. The presence of forest red gum here is likely to be a result of past burning. The understorey is a mixture of sclerophyll and rainforest species. It is probable that the area will return to rainforest if it remains unburnt for sufficient time.

Both the rainforest communities and the forest red gum on the plateau are important components of the reserve's biodiversity and are remnant from previously much larger occurrences of these communities. Management will aim to maintain their existing extent by protection of the rainforest from fire, and burning or slashing of the plateau forest red gum if needed (see section 4.1.4). The small area of turpentine-forest red gum on the southern boundary will, however, be allowed to naturally regenerate and to return to rainforest.

Extensive areas of rainforest and significant eucalypt communities occur on private land and a road reserve adjacent to the nature reserve, including species that are not found in the nature reserve. Protection of these areas is important because of their ecological and scientific significance and to assist the long term viability of the nature reserve. The private land has been zoned 7a Environmental Protection (Ecology) in the Shoalhaven Local Environmental Plan 1995 (amended 16th July 1999). This zoning restricts future development but does not affect existing uses such as grazing.

Introduced species

An introduced species is defined in this plan as any plant or animal species not native to the nature reserve. Introduced species within the reserve and on adjoining land are of concern because they have the potential to detrimentally affect ecological values and can spread to and from neighbouring land.

The nature reserve is largely free of weeds but there are some species of concern. These are madeira vine *Anredera cordifolia* and moth vine *Araujia sericifolia* along the southern boundary and African olive *Olea europaea africana* along the northern section of Currowar Creek. A number of pasture weeds occur in the forest red gum community but regeneration of this area is likely to reduce these.

A large number of introduced species are found on surrounding land and on-going monitoring will be needed to check for invasion into the reserve. Madeira vine, bridal creeper *Myrsiphyllum asparagoides*, cats claw creeper *Macfadyena unguis-cati* and other weed species are well established on adjacent land to the west near the falls. Madeira vine has a smothering habit and its control is vital to the protection of the rainforest. Bush regeneration programs have been undertaken in this area with the consent of the land owner and further programs are planned.

The *Noxious Weeds Act* 1993 places an obligation upon public authorities to control noxious weeds on land that they occupy to the extent necessary to prevent such weeds spreading to adjoining lands. Fireweed *Senecio madagascariensis* is scattered in the forest red gum community and blackberry *Rubus fruticosus* occurs along Currowar Creek in the rainforest. Both will be controlled within the reserve and coordinated control programs with neighbouring landowners will be encouraged.

Policies

- * Native vegetation will be managed to:
 - maintain floristic and structural diversity;
 - maintain the existing extent of rainforest and of forest red gum on the plateau;
 - conserve regionally rare and biogeographically significant species; and
 - encourage regeneration of areas previously cleared or grazed.
- * Introduced plant species will be controlled and, if practical, eradicated. Priority for treatment will be given to those which:
 - have been declared noxious and may affect neighbouring lands;
 - threaten native plant communities;
 - have a high capacity for dispersal and invasion of rainforest communities; and/or
 - are new isolated occurrences.
- * The cooperation of other authorities and neighbours will be sought in implementing weed control programs.

Actions

- * Recovery of the forest red gum community will be monitored.
- * On-going control of madeira vine, moth vine, bridal creeper, cats claw creeper, African olive, fireweed and blackberry will be undertaken as needed in the reserve and within its catchment, in conjunction with neighbours.

- * The occurrence of weeds will be monitored and new infestations will be controlled as necessary. Records will be kept of weed locations and control programs.
- * The Service will investigate the possibility of revegetating the road reserve along the northern boundary of the reserve in conjunction with the Department of Land and Water Conservation and Shoalhaven City Council.
- * The Service will liaise with neighbours, in conjunction with the Department of Land and Water Conservation, to encourage retention and regeneration of areas of native vegetation adjacent to the nature reserve, through such means as development of voluntary conservation agreements, Department of Land and Water Conservation property agreements and fencing to keep out stock.

4.1.3 Native and Introduced Animals

Only limited survey for native animals has been undertaken in the reserve. Observations by local naturalists, Service staff and Robinson & Bofeldt (1997) have been used to create the picture below.

Nearly 100 species of birds have been recorded within the reserve and surrounding area. Many of these are rainforest or forest species such as the brown cuckoo-dove *Macropygia amboinensis*, wonga pigeon *Leucosarcia melanoleuca*, white-headed pigeon *Columba leucomela*, top-knot pigeon *Lopholaimus antarcticus*, satin bowerbird *Ptilinorhynchus violaceus*, black-faced monarch *Monarcha melanopsis*, brown gerygone *Gerygone mouki* and Bassian thrush *Zoothera lunulata*.

Less is known about the mammals and herpetofauna of the reserve. Mammal species known to occur are the swamp wallaby *Wallabia bicolor*, short-beaked echidna *Tachyglossus aculeatus*, common brushtail possum *Trichosurus vulpecula*, common ringtail possum *Pseudocheirus peregrinus*, sugar glider *Petaurus breviceps*, greater glider *Petauroides volans* and common wombat *Vombatus ursinus*. There is evidence that the long-nosed bandicoot *Perameles nasuta*, mountain brushtail possum *Trichosurus caninus* and dusky antechinus *Antechinus swainsonii* occur, but confirmation is needed. At least two bat species in addition to the grey-headed flying-fox have been observed but not identified.

Reptiles recorded in the reserve are the red-bellied black snake *Pseudechis porphyriacus*, Gippsland water dragon *Phygnathus lesueurii*, lace monitor *Varanus varius*, eastern blue-tongue lizard *Tiliqua scincoides*, eastern water skink *Eulamprus quoyii*, small-eyed snake *Rhinoplocephalus nigrescens* (Gaia Research, 2000) and diamond python *Morelia spilota*. Several frog species have been recorded on adjacent land and may occur in the reserve. These are the bleating tree frog *Litoria dentata*, Ewing's tree frog *L. ewingii*, Peron's tree frog *L. peronii*, Verreaux's tree frog *L. verreauxii* and common eastern toadlet *Crinia signifera* (Gaia Research, 2000).

As well as the threatened powerful owl (section 2.2.2), the vulnerable sooty owl *Tyto tenebricosa* is likely to occur in the reserve. The long-nosed potoroo *Potorous tridactylus* has been observed in the past but is unlikely to be still present.

All records of native animals (and plants) are collected and stored on the NSW Wildlife Atlas, a state-wide data base established by the Service. Information is built up about locality, habitat and breeding records and used to assist management of native wildlife.

The vulnerable grey-headed flying-fox is a highly mobile species. It occurs in large groups that follow the succession of flowering and fruiting trees. Individuals move frequently between camps, and regularly occupy sites with a reliable food source.

Large numbers of grey-headed flying-fox visit the region when there is mass flowering of spotted gum. This occurred in 2001, when approximately one quarter of the entire population of grey-headed flying fox was in the Yattheyattah camp and a nearby camp at Kioloa (Gaia Research, 2000).

Yattheyattah is used for feeding and also as a maternity camp during spring. It is usually occupied from October to March but this is highly variable. Counts in the Yattheyattah camp have varied greatly. In June 1985 the population was estimated at more than 100,000. In October/December 1986 the numbers had dropped to 20,000. In April 1987 the numbers had again reached approximately 100,000 but by April 1990 the average number counted was only 8,000. A recent survey (Gaia Research 2000) indicates that during seasons when spotted gums are not in mass flower the size of the camp is in the order of 50-1700 animals. On-going surveys are needed to monitor the population size and variations. The bats are easily disturbed and visitation to the camp will be discouraged during periods when the bats are present.

Introduced animals known to occur in the reserve are the rabbit, fox, feral cat, European goldfinch and common starling. Goats have also been reported. Rabbits may inhibit regeneration of the forest red gum community and will be controlled as needed. Control of feral animals is unfortunately not practical unless undertaken over a larger area in conjunction with neighbours.

Policies

- * Habitat for rainforest dependant native animals will be maintained.
- * The grey-headed flying-fox camp will be protected from disturbance.
- * Introduced animals will be controlled where they have a significant impact on native plant and animal species and where control programs will be effective. Programs will be designed to avoid impact on non-target species and will be undertaken in cooperation with the South Coast Rural Lands Protection Board and neighbouring land holders where appropriate.

Actions

- * Grey-headed flying-fox numbers and areas of use of the reserve will be monitored.
- * Fauna survey will be undertaken, particularly for mammals and herpetofauna.
- * Introduced animal control will be undertaken as needed and coordinated with programs carried out by neighbours.

4.1.4 Fire Management

Management of fire in the reserve is an important issue. It must aim to achieve both long term conservation of native plant and animal communities and ongoing protection of life and property within and adjacent to the reserve.

The fire history of the reserve is not known but it appears that most of the reserve has not been burnt for at least 20 years. Rainforest is fire sensitive and if possible should never be burnt. Fire may be needed, however, to maintain the important red gum forest in the plateau area of the reserve and prevent significant invasion of rainforest species into this area (as discussed in section 4.2.1). The forest red gum community shows signs of having been burnt in the recent past and varies considerably in its structure and

understorey species. Future burning will be guided by the regeneration monitoring program mentioned in section 4.1.2.

Under the *Rural Fires Act 1997* the Service is a fire authority and is responsible for controlling fires on the reserve and ensuring that they do not cause damage to other land or property. An important part of the Service's fire management is participation in local co-operative fire management arrangements. The Service is a member of the Shoalhaven Bush Fire Management Committee which aims to coordinate fire management and fire control on a district basis.

Fire risk in the reserve is low because of the moist nature of the forests and the presence of cleared land on the western and northern boundaries. Any wildfire is most likely to come from outside the reserve and burn into the reserve. Construction of fire trails within the reserve is not appropriate because of its small size, steep slopes and the potential for weed invasion. Slashed fire breaks will be maintained along the northern and western boundaries should this be needed.

Bushfire suppression operations may require the construction of temporary firelines. These will be closed and rehabilitated as part of post fire operations.

Policies

- * Fire will be managed to ensure:
 - protection of human life and property within and adjacent to the nature reserve;
 - maintenance of plant and animal species and communities through the provision of fire regimes compatible with their conservation; and
 - protection of Aboriginal sites, historic places and management structures.
- * As far as possible fire will be excluded from the rainforest communities and the scarred tree (section 4.2.1) will be protected from fire.
- * Prescribed fire or slashing may be used if necessary in the plateau forest red gum community for vegetation maintenance, regeneration or fuel management purposes, and will be designed to minimise adverse impacts on natural and cultural values.
- * Use of heavy machinery in the reserve for fire suppression will be avoided as far as possible.
- * Areas disturbed by fire suppression operations will be rehabilitated as soon as practical after the fire.
- * Records and maps will be maintained of any fires that occur.
- * Close contact and cooperation will be maintained with volunteer rural fire brigades, Council fire officers and reserve neighbours. The Service will continue to actively participate in the Shoalhaven Bush Fire Management Committee.
- * Slashed fire breaks will be maintained along the northern and western boundaries of the reserve as needed.

4.2 CULTURAL HERITAGE

Cultural heritage includes both Aboriginal and non-Aboriginal history and associated activities and works. It comprises important sites, structures and relics that may have aesthetic, historic, scientific and social significance to present and future generations.

4.2.1 Aboriginal Sites

The reserve is situated within the lands of the Budawang/Murramarang tribes of the Dhurga language group and is now in the area of the Ulladulla Local Aboriginal Land Council. Yatteyattah is an Aboriginal name meaning 'water tumbling down'.

It is likely that the reserve area was a source of rainforest fruit, food animals and materials for the Aboriginal people of the area. The reserve is unlikely to have provided suitable sites for regular camping, however, because of the mainly steep slopes. Only a small part of the reserve has been surveyed for Aboriginal sites and the only site found was a scarred tree. A second scarred tree was located nearby on an adjacent road reserve.

A number of open camp sites and shelters containing art and occupation deposits are known from the escarpment foothills west of the reserve and around Conjola Lake to the east.

The strong attachment of Aboriginal people to the land is acknowledged. Archaeological sites are important to Aboriginal communities as they are a testament to their culture's great antiquity. Aboriginal people may also have traditional spiritual links with an area and hold knowledge which is important for nature conservation. Aboriginal sites are also important to non-Aboriginal people as they provide information about the past ways of life of all humans.

While the Service presently has legal responsibility for the protection of Aboriginal sites it acknowledges the right of Aboriginal people to make decisions about their own heritage. It is therefore policy that Aboriginal communities be consulted about decisions regarding the management of Aboriginal sites and related issues and how the Aboriginal culture and history of an area controlled by the Service will be promoted and presented.

Policies

- * The Ulladulla Local Aboriginal Land Council and other relevant Aboriginal community organisations and individuals will be consulted and actively involved in all aspects of management of Aboriginal sites and values in the reserve.
- * Aboriginal sites will be protected from disturbance or damage by human activities.
- * All works with the potential to impact on Aboriginal sites will be preceded by an archaeological assessment.
- * The location of Aboriginal sites will not be publicised except where:
 - the agreement of the Ulladulla Local Aboriginal Land Council and other relevant Aboriginal community organisations has been obtained;
 - a conservation study has been prepared and any management works necessary to protect the site from damage have been implemented; and
 - the site will be interpreted to promote public knowledge and appreciation of Aboriginal culture.

Action

- * The scarred trees will be recorded and their significance assessed.

4.2.2 Non-Aboriginal Historic Places

The rich soils and red cedar of the district attracted European loggers and settlers early last century. The area was formerly known as Armstrong Forest. A track that goes part way into the reserve from the northern boundary may have been cleared by loggers.

The first recorded European settler in the Yatteyattah area was Kendall in 1828, followed by Murray, Warden, McLean and Sheaffe in the 1840s and 1850s. Most of the reserve area escaped clearing as the steep rocky slopes are unsuitable for farming. Stock from adjacent properties have, however, grazed the plateau section.

The south-eastern boundary of the reserve is marked by the remains of a post and rail fence and a dry stone wall. Their age is not known but it is likely that they date from last century. Dry stone walls are rare in the district (Shoalhaven City Council, 2001).

An old Roman Catholic cemetery dedicated in 1869 is located just outside the reserve, adjacent to the north-eastern corner. A total of 76 people were buried here. The area has been disturbed in the past and since become overgrown. A number of headstones remain but they have been damaged and moved from their original locations. The cemetery reserve has been fenced in conjunction with fencing of the nature reserve.

Yatteyattah was gazetted as a recreation reserve in 1890, following donation of the land by Mr A. McLean. The area was a popular picnic destination around the turn of the century. Visitors tethered their horses in yards nearby and walked to waterfalls on Currowar Creek and its main tributary. A walkway was formed by local volunteers, built up with rocks. A small section of the old walkway can be seen at the western end of the reserve but most is on adjacent private land. As this walkway crosses private land, its use to gain access to the reserve will not be encouraged.

The area remained a destination for walkers during the first half of the 20th century but unfortunately shooting parties targeted the flying-foxes and pigeons, and removal of epiphytes such as birds nest ferns and orchids was common. During recent years the area has become less well known, although it is still visited occasionally by bushwalking clubs and individuals wishing to enjoy the rainforest.

As stated in section 2.2.2, the reserve is considered to be culturally significant as a place recognised in the 19th century as worthy of conservation, donated for public use and as a local recreation destination. The features from former farming, recreational and other uses are of historic interest but their significance has not been determined. They should be recorded and assessed, and management strategies prepared.

Policies

- * The historic places of the nature reserve will be conserved in accordance with the Burra Charter of Australia ICOMOS.
- * The fences, walkway, inscribed tree and other features remaining from former use of the reserve will be protected from human disturbance, and will be managed in accordance with strategies to be determined following assessment of their significance.

Action

- * Historic features will be recorded and their significance assessed. Management strategies will be developed based on the assessment. Protective work such as vegetation control may be undertaken if needed pending the assessment.

4.3 USE OF THE AREA

Certain uses may be appropriate in Service areas provided that they do not conflict with the primary purpose of conservation of natural and cultural heritage and are consistent with the objectives and strategy of the plan of management. The major categories of use that can be appropriate in Service areas are:

- education and promotion of the area, the Service and the conservation of natural and cultural resources;
- involvement of the public in aspects of management;
- certain types of recreation;
- research; and
- management operations by the Service and other authorities with statutory responsibilities in the area.

The extent to which these categories of use will be provided for in Yatteyattah Nature Reserve is indicated below.

4.3.1 Promotion and Visitor Opportunities

The primary purposes of nature reserves are conservation of wildlife, natural environments and significant cultural features and to provide opportunities for education and scientific research into these resources.

Yatteyattah Nature Reserve is a small area with significant rainforest and important habitats that would be vulnerable to damage by substantial or inappropriate use. In particular it is essential to protect the grey-headed flying-fox colony from disturbance. Much of the reserve is either steeply sloping or consists of easily disturbed and erodable creek bank areas. For these reasons recreational use of the reserve will not be actively promoted. Interested people and educational groups, however, will still be able to visit the reserve.

Access to the nature reserve is by a short walk along a road reserve from the Princes Highway, that leads to the northern boundary of the reserve. Stiles have been constructed to take visitors over fences and an interpretive shelter is located at the reserve boundary. Beyond this point there are no formal tracks.

It is estimated that the reserve receives between 100 and 200 visitors each year, mostly local community groups.

Some of the rainforest and features of interest are located on private property, particularly the waterfall west of the reserve (known as Yateyattah Falls). Visitors will need to seek permission from property owners before entering private land.

The amount of use and associated impacts will be monitored. If disturbance of the flying-fox colony, environmental damage or intrusion onto adjoining private property occur, consideration will be given to directing visitors along a defined route or limiting the amount of use.

Policies

- * Foot access to the reserve will continue to be provided from the Princes Highway to the northern boundary of the reserve. The access will remain low key so that incidental visitation is not encouraged.
- * Recreational use will not be promoted but visits for educational purposes are considered appropriate.
- * Understanding and appreciation of the high conservation values of the reserve by visitors and the local community will be encouraged through provision of interpretive information on site and other media as appropriate.
- * The location of the flying-fox colony will not be publicised.
- * Markers and signs will be used where needed to identify the reserve boundaries and discourage visitors from entering private property.
- * Public use may be confined to suitable locations and all visitation to the reserve may be restricted during the flying fox breeding season (late spring to summer).
- * Prior consent will be required for educational and other group visits to the reserve. Total numbers will be restricted and group sizes will be limited to a maximum of 15. Visits to the flying-fox colony will not be permitted unless authorised by the Area Manager.
- * A limited number of NPWS Discovery tours may be arranged to satisfy public interest in the reserve.

Action

- * The level and impact of public use of the reserve will be monitored and measures to reduce impacts will be introduced if needed.

4.3.2 Research

Scientific study in the reserve improves understanding of its natural and cultural heritage and the processes that affect them. Research also establishes the requirements for management of particular species.

Several vegetation surveys have been conducted in the reserve and some native animal surveys have been undertaken. Further fauna survey and on-going monitoring of introduced species and visitor use are needed.

A prospectus will be prepared to encourage involvement of other organisations and individuals, including students, in priority research areas.

Policies

- * Yatteyattah Nature Reserve will be available for appropriate research.
- * Service conducted research will aim to provide information about natural and cultural heritage and human use, in order to facilitate management of the reserve.
- * Liaison will be maintained with researchers to obtain as much mutual information and assistance as possible. The results of research will be required to be provided to the Service.
- * Research structures and long term markers may be permitted with conditions, including placement in locations that minimise their visual impact and removal upon completion of the research.

Action

- * A prospectus will be prepared as a guide to preferred research projects in the reserve. Preferred topics will be those of direct relevance to management and will include:
 - fauna survey;
 - vegetation regeneration and the effects of fire;
 - Aboriginal site survey;
 - historical research;
 - monitoring of the flying-fox colony;
 - monitoring of introduced species; and
 - monitoring of visitor impacts.

4.3.3 Management Operations

There are no Service management facilities in the reserve but the northern boundary and parts of the eastern and western boundaries have been fenced to exclude stock. It is not practical to fence the creekline that forms the southern boundary because of the damage that would be caused to rainforest vegetation.

Management access is generally by foot but a slashed fire break to be maintained as needed along the northern fenceline will allow for essential vehicle access to this part of the reserve. Access to other parts of the reserve for purposes such as weed control is by arrangement with neighbours.

As stated in section 4.1.2 adjacent power lines cross the reserve, with consequent high visual impacts and a need for on-going clearing beneath the lines at the northern end. Arrangements for minimising clearing will be needed. It would be highly desirable for the lines to be removed or relocated outside the reserve.

Policies

- * New works, facilities or operations proposed by any organisation or individual will not be permitted unless they are consistent with the purposes of dedication of the reserve and this plan of management.
- * Close liaison will be maintained with reserve neighbours to deal with matters of mutual concern, with emphasis on the protection of native vegetation contiguous with the nature reserve.

Action

- * A maintenance agreement that minimises clearing will be arranged for the power lines. Liaison will be maintained with Integral Energy to determine the on-going need for the power lines. If feasible, arrangements will be made for their removal from the nature reserve.

5. PLAN IMPLEMENTATION

This plan of management is part of a system of management developed by the National Parks and Wildlife Service. The system includes the National Parks and Wildlife Act, management policies, established conservation and recreation philosophies, as well as strategic planning at corporate, Directorate and Regional levels.

Implementation of this plan will be undertaken within the annual programs of the Service' Far South Coast Region. Priorities, determined in the context of regional strategic planning, will be subject to the availability of necessary staff and funds and to any special requirements of the Director-General or Minister.

The environmental impact of all development proposals will continue to be assessed at all stages of the development and any necessary investigations undertaken in accordance with established environmental assessment procedures.

Section 81 of the Act requires that this plan shall be carried out and given affect to, and that no operations shall be undertaken in relation to the nature reserve unless they are in accordance with the plan. No term is proposed for this plan of management. If after adequate investigation, operations not included in the plan are found to be justified, this plan may be amended in accordance with 76(6) of the Act.

As a guide to the implementation of this plan, relative priorities for identified actions are summarised below:

ACTION	PLAN REF
High Priority	
* Control madeira vine, moth vine, African olive, fireweed & blackberry	4.1.2
* Monitor weeds and control new infestations	4.1.2
* Monitor flying-fox colony	4.1.3
Medium Priority	
* Monitor recovery of the forest red gum community	4.1.2
* Encourage conservation of adjacent native vegetation	4.1.2
* Undertake survey for mammals and herpetofauna	4.1.3
* Control introduced animal species	4.1.3
* Arrange maintenance agreement for power lines	4.3.3
Low Priority	
* Investigate the possibility of revegetating the road reserve along the northern boundary	4.1.2
* Record and assess cultural features	4.2.2
* Monitor level and impact of public use	4.3.1
* Prepare research prospectus	4.3.2

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