

POPRAN NATIONAL PARK
PLAN OF MANAGEMENT

NSW National Parks and Wildlife Service

August 2000

This plan of management was adopted by the Minister for the Environment on 14th August 2000.

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Photograph of Ironbark Creek in Popran National Park by Joel Winter.

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FOREWORD

Popran National Park covers 3,970 hectares and is located north of the Hawkesbury River, some 50 kilometres north of the centre of Sydney and 25 kilometres south-west of Gosford. The park, which is in five sections, contains spectacular sandstone cliffs, a number of Aboriginal sites, important vegetation communities and acts as a wildlife corridor between Brisbane Water National Park to the east and Dharug National Park to the west.

Popran National Park is one of a large group of predominantly sandstone parks and reserves that forms a green belt around metropolitan Sydney. The maintenance of this concept of "corridors of green" linking areas of bush land across a wide range of environments is important for the conservation of natural biodiversity.

This plan of management maintains the important natural values and isolated recreation qualities of the park. It also provides for the Aboriginal sites within the park to be protected and managed in liaison with the local Aboriginal community. Recording of the park's resources and research into the park and its management will be encouraged.

Priority will be placed on maintenance of catchment values. A fire management plan and strategies for park-wide weed control and feral animal control will be prepared and progressively implemented, and monitoring of water quality and flows will be undertaken.

Limited facilities will be provided for recreation that complement those available in other parks within the sub-region. The emphasis will be on encouraging recreational activities which are of low intensity and need few developed facilities.

This plan of management establishes the scheme of operations for Popran National Park. In accordance with the provisions of Section 75 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 national park. A plan of management is a legal document that outlines how the area will be managed in the years ahead.

The procedure for the adoption of a plan of management is specified in the Act and involves the following:

- * The Director-General gives notice that a plan of management has been prepared.
- * The plan is placed on public exhibition for at least one month and during this period any person may make representations about the plan.
- * The plan and copies of all the representations are referred to the National Parks and Wildlife Advisory Council for consideration.
- * The Director-General submits the plan together with any comments and suggestions of the Council to the Minister.
- * The Minister may adopt the plan after considering the comments of the Advisory Council or may refer the plan back to the Director-General and Council for further consideration before adoption.

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

A draft plan of management for Popran National Park was placed on public exhibition from 14th May to 30th July 1999. The exhibition of the draft plan attracted 30 submissions which raised 12 issues. All comments received were referred to the National Parks and Wildlife Advisory Council for its consideration and advice. The comments and suggestions of the Council were in turn considered by the Minister before adopting this plan of management.

Additional information or enquiries on the management of Popran National Park may be obtained from the National Parks and Wildlife Service Office at 207 Albany Street North, Gosford or by telephone on (043) 24 4911 during business hours.

2. MANAGEMENT CONTEXT

2.1 NATIONAL PARKS IN NEW SOUTH WALES

The national park concept was introduced into Australia with the establishment of the Royal National Park in 1879.

For the purpose of preparing plans of management, the 1994 International Union for the Conservation of Nature and Natural Resources (IUCN) definition of a national park has been adopted in New South Wales.

"a natural area of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area, and (c) provide a foundation for spiritual, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible".

National parks are a part of the regional pattern of land use. The management of a national park aims at minimising disturbance to natural and cultural heritage. Other land uses (e.g. agriculture, forestry and mining) are distinguished by an acceptance or encouragement of environmental modification. National parks provide for only a limited part of the pattern of land use in any region.

2.2 POPRAN NATIONAL PARK

2.2.1 Location and Regional Context

Popran National Park currently consists of five separate areas of land and covers 3,970 hectares. It is located north of the Hawkesbury River, some 55 km north of the centre of Sydney and 25 km south of Gosford. The park is bounded by the Hawkesbury River to the south; Ironbark, Berecry, Peats Ridge, Popran, Nicklins and Wisemans Ferry roads; the Pacific Highway and F3 Freeway to the east; Crown land at Mt White and private properties along Mangrove and Ironbark Creeks and the hamlet of Wendoree Park. Travelling north on the Sydney-Newcastle Freeway, Popran commences 1.5 km from the northern end of Peats Ferry Bridge on the western side and continues north for approximately 5 km. It includes a small section of the Hawkesbury River foreshore east and north of Milson Island.

The five sections of the park are:

The Mt White section of Popran National Park, which is located approximately 2 km south of Mt White. It is bounded by the Sydney-Newcastle Freeway and Pacific Highway to the east and by the Hawkesbury River and the settlements of Bar Point and Big Jims Point to the south and west. It includes part of the Marlows Gully and Cascade Gully catchments.

The Calga section of the park, which is located south-west of the Calga Interchange. This section protects part of the Kellys Creek catchment, a tributary of Popran Creek.

The Mt Olive section, which is located north of Popran Road, east of Mangrove Mountain Road and west of Peats Ridge Road. It includes part of the Popran, Ironbark and Hominy Creek catchments.

The Bedlam Creek section, which is mainly situated between Mangrove Creek and Wisemans Ferry Road, although a small section of the park is east of Wisemans Ferry Road down to the edge of Bedlam Creek.

The Mangrove Mountain section of the park, which is located east of Mangrove Mountain on the upper reaches of Popran Creek.

Popran National Park protects an important area of native vegetation and wildlife corridor between Brisbane Water National Park to the east and Dharug National Park to the west. The area was first proposed as a nature reserve by the National Parks Association (NSW) in 1985 and on 30th November 1994 a park was gazetted which incorporated much of the original proposal. Popran National Park was named after the major creek which flows through the park and the local Parish of Popran.

2.2.2 Significance of Popran National Park

Biological Conservation Value

Popran National Park is one of a large group of predominantly sandstone parks and reserves surrounding Sydney. Other parks in this group include the extensive areas of Wollemi National Park, Blue Mountains National Park, Dharug National Park, Yengo National Park, Parr State Recreation Area and important smaller national parks surrounding metropolitan Sydney such as Royal, Heathcote, Ku-ring-gai Chase, Marramarra, Brisbane Water and Bouddi.

Large tracts of natural areas which include State Forests, the Gosford/Wyong water catchment Area and the Mangrove Creek Catchment Area lie adjacent to and complement the national park system.

Popran National Park completes a corridor of bushland extending from Brisbane Waters to the western side of the Blue Mountains.

The maintenance of this concept of “corridors of green” linking areas of bush land across a wide range of environments is important for the conservation of biodiversity.

The diverse range of age classes of the vegetation with respect to wildfire is also an important part of the biodiversity of the area.

The remnants of native vegetation on lower shale slopes and alluvium that the park conserves are particularly important as many such communities have been cleared along the Hawkesbury River.

The protection of undisturbed catchments of tributaries to the Hawkesbury River is also critical to the continuation of aquatic life and natural systems associated with the river.

The park provides areas of substantially natural habitats, including nesting and breeding sites, that support a wide range of species, some of whose territories range over the surrounding rural areas.

Sixteen threatened animal species and fourteen threatened and restricted plant species have been recorded as occurring in the park area.

Landscape and Geological Conservation Value

Popran National Park lies within the Sydney Basin, a major structural unit of Permian and Triassic age (270-180 million years ago) consisting almost entirely of horizontally bedded sedimentary rocks. The park lies on the northern margin of a structural subdivision of this basin, the Hornsby Plateau.

Two large south-flowing creek systems, Popran Creek and Ironbark Creek, are incised into the plateau.

The park itself consists of four major land group settings. Hawkesbury Sandstone overlies Narrabeen Group sedimentary rocks. Igneous rocks intrude the sandstone near Mt Olive. Substantial alluvial deposits have accumulated on the river flats.

Popran National Park demonstrates a number of erosion cycles which have produced distinctive peneplain surfaces. The vigorous erosion cycle of the modern Hawkesbury-Nepean River, at the end of the Pliocene Period (2-3 million years ago) and during the Pleistocene Period (2 million-10,000 years ago) when sea levels were much lower, deeply entrenched the Hawkesbury River, Broken Bay, Pittwater and the broad basin of Brisbane Water. The present spectacular landscape of the foreshore developed as a result of the progressive drowning of these river valleys by the sea following the end of the last glacial period, 18,000 to about 7,000 years ago.

Cultural Heritage Value

The park covers an area used by the Ku-ringai, Darkinjung and possibly also the Dharug people. It is believed that a travel route used by both inland and coastal Aboriginal groups crossed the area which is now park. The Aboriginal sites in the area provide physical evidence of a long standing culture and are part of present day

Aboriginal culture. One site, Upside Down Man Cave, is listed in the Register of the National Estate. The park is located within the area of the Darkinjung Local Aboriginal Land Council who are consulted on management of Aboriginal sites in the park.

Research Value

The park provides opportunities for scientific research, particularly in the fields of rare plants, historic and Aboriginal archaeology, herpetology, entomology and park management issues such as appropriate fire regimes and control of introduced plants and animals..

Recreation Value

Popran National Park provides opportunities to undertake low-intensity recreation in a natural setting with few facilities. At present the only recreational facilities in the park are a number of management tracks and recreational activities undertaken include bushwalking, sightseeing, cycling and horse riding.

Popran National Park is an important local recreational resource for the people of the Mangrove Mountain-Mt White-Mangrove Creek area. In future it may also attract visitors from a wider area including Gosford, Wyong and the northern Sydney metropolitan area.

3. OBJECTIVES OF MANAGEMENT

3.1 GENERAL OBJECTIVES FOR NATIONAL PARKS

The following general objectives relate to the legal requirements for the management of national parks in New South Wales:

- * the protection and preservation of scenic and natural features;
- * the conservation of wildlife;
- * the maintenance of natural processes as far as is possible;
- * the preservation of Aboriginal sites;
- * the protection of historic structures and features;
- * the promotion of appropriate use, understanding and enjoyment; and
- * the encouragement of scientific and educational enquiry into environmental features and processes, prehistoric and historic features and park use patterns.

3.2 SPECIFIC OBJECTIVES FOR POPRAN NATIONAL PARK

In addition, the following specific objectives relate to the management of Popran National Park:

- * management of Popran National Park as part of a system of parks and reserves which together conserve the biodiversity and catchment values of the lower Hawkesbury River and provide a vegetation and wildlife link between the national parks to the east and west;
- * protection of the Aboriginal sites within the park in conjunction with the local Aboriginal community;
- * provision of opportunities for low-intensity recreation in a natural setting; and
- * promotion of the use of the park for environmental education purposes.

4. POLICIES AND FRAMEWORK FOR MANAGEMENT

This section contains the policies and framework for the management of Popran National Park together with relevant background information. Policies are summarised under the following headings:

- * natural heritage;
- * cultural heritage; and
- * use of the park.

The objectives and policies established in this plan of management provide the long term framework for management of Popran National Park. The actions identified are those immediate proposals which are to be undertaken in the next five years, subject to the availability of staff and funds. Other management actions may be developed over the life span of this plan of management consistent with the policies set out in the plan.

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

4.1 NATURAL HERITAGE

4.1.1 Geology, Landforms, Hydrology and Soils

Popran National Park lies within the Sydney Basin, a major structural unit of New South Wales. The Sydney Basin is of Permian and Triassic age (270-180 million years ago) and consists almost entirely of horizontally bedded sedimentary rocks. Popran National Park lies on the northern margin of a structural subdivision of this basin, the Hornsby Plateau, and consists mainly of an undulating plateau of Hawkesbury Sandstone.

This heavily weathered plateau is dissected by Ironbark, Popran, Bedlam and Hominy Creeks. The southern boundary of the park is the drowned river valley of the Hawkesbury River which dissects the Hawkesbury Sandstone forming dramatic cliff-lines. To the west is Mangrove Creek, a major tributary of the Hawkesbury River.

The Hawkesbury Sandstone overlies the Narrabeen Group and consists of medium to coarse grained quartz. On broader ridges deeper yellows soils with distinctive horizons can be found, while shallower sandy soils predominate on narrower ridge tops and valley slopes. In places the sandstone has eroded exposing small areas of shale (shale lenses) which support a swampy organic soil.

The Narrabeen Group consists of sandstones and shales of the Terrigal formation. They are visible along Ironbark Creek, Popran Creek and the Hawkesbury River below the 100 metre contour. Soils derived from this base form relatively deep clay

soils. At higher elevations these soils are influenced by talus and downwash from the overlying Hawkesbury sandstone.

Alluvial sediments occur on the river flats along Mangrove Creek. These estuarine sediments consist mainly of sand and saline mud.

Small volcanic intrusions outcrop in the Mt Olive area. The richer basalt soils in these areas support a forest quite different from that in the remainder of the park, however most is on private land and not within the park.

Popran National Park plays an important role in protecting the catchments of a number of creeks which flow into Mangrove Creek and the Hawkesbury River. The Service supports the principles of Total Catchment Management as embodied in the Catchment Management Act 1989 and will continue to support the Hawkesbury-Nepean Catchment Management Trust, and a local Mangrove Creek catchment committee if formed.

The park contains a complex of small creeks. Unpolluted tributaries to the Hawkesbury River are becoming scarce and the protection of this resource is one of the management objectives for the park

To the north of the park there are a number of companies extracting groundwater for bottling as mineral water. The Department of Water Resources has indicated that these extractive activities may affect the level of the water table within the park and the flow of springs and creeks within the park during periods of drought.

There are also a number of sandstone quarries adjoining or near the park in the Mt White and Calga area. The quarries impact on views from within the park and may increase siltation in creeks flowing through the park. Some old quarries have been used over the years as dumps and there are contaminants leaching from these areas into the park.

Future Service activities to control and suppress fire or provide access and facilities, must be designed and located to minimise any potential effects on the soil and catchment values of the park. Recreational use along the creeks within the park also has the potential to affect bank stability and water quality.

Policies

- * The catchments which lie within the park boundaries will be protected from disturbance.
- * All land management and development within Popran National Park will incorporate effective soil erosion and sedimentation control principles and practices.
- * Rehabilitation of disturbed areas within the park will use local soils and plants propagated from local genetic stock.

- * The Service will promote minimum impact walking and camping practices within the park.
- * The Service will support the principles of total catchment management within Popran National Park and will liaise with the local catchment management committee, local councils and other authorities to maintain and improve the water quality of the creeks within the park.

Actions

- * The Service will actively encourage regular monitoring of the impacts of water extraction on water quality, water table levels and creek flows.
- * Discussions will be held with the users of the quarries near the park and other authorities regarding the containment of silt and contaminants and means of preventing them from entering the park.

4.1.2 Native and Introduced Plants

Popran National Park conserves an important area of natural vegetation which forms a transition between the moister coastal sandstone vegetation of Brisbane Water National Park and the drier sandstone vegetation of Dharug National Park. The vegetation of the area was surveyed by the Royal Botanic Gardens (Clarke and Benson, 1987). This survey identified 19 vegetation types and 450 plant species in and around the park. The range of vegetation within the park reflects variations in geology, hydrology, aspect and fire history.

Most of the park consists of open forest and woodland on the exposed ridges and slopes of Hawkesbury Sandstone. The dominant tree species include Sydney red gum *Angophora costata*, red bloodwood *Corymbia gummifera*, grey gum *Eucalyptus punctata*, Sydney peppermint *Eucalyptus piperita*, narrow-leaved apple *Angophora bakeri* and scribbly gum *Eucalyptus haemastoma*.

Small areas of shrub and heath occur on poorly drained areas of the Hawkesbury Sandstone. The vegetation of these areas is dominated by dwarf apple *Angophora hispida*, heath banksia *Banksia ericifolia*, *Allocasuarina distyla*, *Banksia robur*, *Banksia oblongifolia*, *Hakea teretifolia* and *Baeckea diosmifolia*. Sedges are found on the wetter shale lenses.

Vegetation on the Narrabeen soils along Ironbark Creek includes rainforest, Deane's blue gum *Eucalyptus deanei* forest, rough barked apple *Angophora floribunda* forest, and ironbark forest/red gum forest. Of particular importance are the open forests containing thin-leaved stringybark *Eucalyptus eugenioides*, forest red gum *E. tereticornis* and grey ironbark *E. paniculata*. Most red cedars *Toona ciliata* in the area were logged in the past however a few remain along Ironbark Creek and in the northern section of the park. The remnants of native vegetation on the lower shale slopes that are conserved within Popran National Park are important because many of such communities have been cleared along the length of the Hawkesbury River.

Patches of rainforest also occur in the deep sheltered valleys on Narrabeen shales along Popran Creek, Bedlam Creek and Hominy Creek. Plants that are typical of this community are lilly pilly *Acmena smithii*, rough-barked apple *Angophora floribunda* and coachwood *Ceratopetalum apetalum*.

A wide range of structural formations from herbland to closed forest occurs on the alluvium, forming a successional progression from the intertidal zone to the back valleys of major creeks. Fringe forest on the edge of the alluvial flats, some of which occurs inside the park, is typified by species adapted to tolerate varying conditions of salinity and waterlogging such as swamp oak *Casuarina glauca*, paperbark *Melaleuca styphelioides* and *M. ericifolia*, swamp mahogany *Eucalyptus robusta* and reed grass *Phragmites australis*. Mangroves also occur along the foreshores but almost none is within the park.

The richer soils of the basalt intrusions support a forest dominated by rough-barked apple *Angophora floribunda*, white stringybark *Eucalyptus globoidea*, turpentine *Syncarpia glomulifera*, forest oak *Allocasuarina torulosa* and Gosford wattle *Acacia prominens*. Dry sub-tropical rainforest also occurs in these areas. Main species of the rainforest are *Alectryon subcinereus*, *Toona ciliata*, *Hymenosporum flavum* and *Euroschinus falcata*. Only a very small area of basalt vegetation is within the park.

Large areas of blue gum forest on the lower hillslopes and alluvial valleys are excluded from the park. Most of the ironbark forests in Mangrove Creek are found on the lower hillslopes outside Popran National Park.

The Mangrove Mountain section of the park is believed to have had no fires in 30 years, which is a major difference to the rest of the park. The vegetation in this section is therefore of scientific interest.

Two plants found within the park, *Acacia bynoeana* and *Tetratheca glandulosa*, are listed under the Threatened Species Conservation Act 1995. *Acacia bynoeana* is listed as endangered while *Tetratheca glandulosa* is listed as threatened. Under the Threatened Species Conservation Act a recovery plan and/or threat abatement plan must be prepared for endangered and vulnerable plants and animals. The purpose of a recovery plan is to promote the recovery of a threatened species, population or ecological community to a position of viability in nature. A threat abatement plan outlines the management of key threatening processes with a view to their abatement, amelioration or elimination.

A further twelve plants which are restricted in their distribution have also been recorded in the area. These are *Blechnum ambiguum*, *Blechnum camfieldii*, *Darwinia glaucophylla*, *Dodonaea camfieldii*, *Grevillea diffusa* ssp. *filipendula*, *Leucopogon amplexicaulis* and *Persoonia isophylla*.

Introduced plants are not presently a significant threat to the conservation of the native flora in the park. They are found mainly along roadsides and the park boundaries. Agricultural and quarrying activities are however occurring in the major creek catchments in the park. Increased transport of sediments, weed seed and

nutrients into the park, combined with the eroding soils, create favourable conditions for the establishment of weeds.

Introduced plants of concern in the park include crofton weed *Ageratina adenophora*, blackberry *Rubus sp.*, lantana *Lantana camara*, privet *Ligustrum lucidum* and *L. sinense* and whisky grass *Andropogon virginicus*. Crofton weed is already a major problem within the park and privet and whisky grass may be a problem in future.

The Noxious Weed Act 1993 places an obligation on the Service to control noxious weeds on areas that it manages to the extent necessary to prevent weeds spreading to adjoining lands. Of the above, only crofton weed and blackberry are listed as noxious weeds in the Gosford City Council area. Crofton weed has the potential to become a major problem in the creek lines and a control program is currently being undertaken jointly by the Service and Gosford City Council to control crofton weed within the area.

Established bush regeneration techniques, including the selective use of herbicides, will be applied in the park. Where practical, preference will be given to weed control techniques that have minimal environmental impact.

Policies

- * Populations of threatened or locally significant species and communities will be identified and protected from disturbance. Recovery and/or threat abatement plans will be implemented for threatened species.
- * Introduced plants will be controlled and where practicable eradicated. Preference will be given to techniques which have minimal environmental impact.
- * Priority for control of introduced species will be given to those which:
 - are declared noxious;
 - are a threat to biodiversity;
 - have a high capacity for dispersal;
 - are likely to spread along access routes; and/or
 - constitute a fire hazard.
- * Programs to control the invasion and spread of introduced plants within the park will be developed in consultation with neighbouring landholders.
- * Conservation of important vegetation communities on lands adjoining the park will be promoted through input into the Catchment Management Committee and through information to local community groups.

Actions

- * The distribution of threatened and uncommon plant species will be mapped and threatening processes identified.

- * Research will be undertaken into the ecology of the northern section of the park to determine its importance and any special management requirements.
- * Information on the importance of conserving threatened and uncommon vegetation on and off park will be prepared and provided to community groups.
- * A strategy for park-wide weed control will be prepared. Crofton weed will be given the highest priority as part of the strategy. An environmental assessment of the control methods to be used will also be part of this strategy.

4.1.3 Native and Introduced Animals

Comprehensive wildlife survey assessments were undertaken in Popran National Park by District staff during 1997. These and other surveys in and around the park have recorded seventeen native animals listed in the schedules of the Threatened Species Conservation Act, 1995: the powerful owl *Ninox strenua*, glossy black cockatoo *Calyptorhynchus lathami*, masked owl *Tyto novaehollandiae*, sooty owl *Tyto tenebricosa*, barking owl *Ninox connivens*, black bittern *Dupetor flavicollis*, Australasian bittern *Botaurus poiciloptilus*, tiger quoll *Dasyurus maculatus*, brush-tailed phascogale *Phascogale tapoatafa*, yellow-bellied glider *Petaurus australis*, squirrel glider *Petaurus norfolcensis*, broad headed snake *Hoplocephalus bungaroides*, heath monitor *Varanus rosenbergi*, red-crowned toadlet *Pseudophryne australis*, green and golden bell frog *Litoria aurea* and two bat species (*Miniopterus schreibersii* and *Myotis adversus*).

Some species found in the park, although not listed as threatened, are of conservation importance. Examples of such species which are locally restricted include the platypus *Ornithorhynchus anatinus*, peregrine falcon *Falco peregrinus*, barking owl *Ninox connivens*, wedge-tailed eagle *Aquila audax* and brown toadlet *Pseudophryne bibronii*.

Ninety three species of birds have been recorded in the park to date. Popran National Park is part of the essential range of habitats available to migratory bird species. For example honeyeaters, such as the grey-breasted silvereve *Zosterops lateralis* and yellow-faced honeyeater *Meliphaga chrysops*, utilise the south-eastern Australian elevated forest lands in the autumn and the nectar rich heathlands along the coast in winter. Specific management practices may be necessary to protect the habitats of migratory species.

Popran National Park is significant for the large population of threatened glossy black cockatoos which are found throughout the park, and masked owls found mainly in the tall forests of the wet gullies. The nearby areas of Yengo, Marramarra and Brisbane Water National Parks enhance these populations.

Thirty one species of mammals are known to occur in the park including nine species of bat. The forests on the park's slopes provide habitat for tree-dwelling marsupials such as greater gliders *Petauroides volans*, sugar gliders *Petaurus breviceps* and feather-tailed gliders *Acrobates pygmaeus*. The honey-comb

weathered rock shelters on the ridge tops provide habitat for small mammals, bats and reptiles. The brown marsupial mouse *Antechinus stuartii*, a small insect-eating marsupial, builds a ball-shaped nest in rock crevices. Small bats, like the eastern horseshoe bat *Rhinolophus megaphyllus* and the threatened bent-winged bat *Miniopterus schreibersi*, also roost in the honey-comb formations.

Twenty-six species of reptiles have been recorded in and around the park. The southern leaf-tailed gecko *Phyllurus platurus* is a characteristic reptile of the rocky areas and the endangered broad-headed snake is found under rock laminations in this habitat.

Eleven species of amphibians have been recorded in and around the park. The creeks and the hanging swamps within the park are important in supporting species that require very specialised habitat, especially frogs. The red-crowned toadlet inhabits debris beside non-perennial creeks in Hawkesbury sandstone and for the green and golden bell frog is found along the edge of streams and in debris on river flats.

The lack of disturbance and the extensive, topographically diverse areas of weathered sandstone provide a diversity of micro habitats and niches suitable for both invertebrates and smaller vertebrates. It is probable that further study will record additional reptile and amphibian species in the park.

Introduced animals of particular concern in the park include foxes, goats, dogs and cats. Methods used to control introduced animals in the park include trapping, baiting and aerial shooting. Baiting for foxes is currently undertaken in conjunction with neighbouring landowners. Wild dog control programs, which may include 1080 ground baiting, will continue to be undertaken in conjunction with programs in the nearby Brisbane Water and Dharug National Parks and with neighbours.

Policies

- * Conservation of animal populations will be based on the maintenance of natural processes and protection of their habitats.
- * Introduced animals will be controlled and where practicable eliminated. Preference will be given to control techniques which have minimal environmental impact.
- * Programs to control introduced animals will be undertaken in conjunction with neighbours where appropriate.
- * Domestic stock found on the park will be removed or impounded.
- * Priority for control of introduced species will be given to those which:
 - are a threat to the biodiversity of the park;
 - are or may affect neighbouring lands;
 - are likely to spread disease; and/or
 - are declared noxious.

Actions

- * The distribution of endangered animal species will be recorded and mapped.
- * The distribution and density of introduced animal species will be mapped.
- * A feral animal control plan will be prepared. Pending preparation of the plan, priority will be given to the control of foxes and dogs in the park.

4.1.4 Fire Management

Fire can directly affect the conservation of native plants and animals, their habitats and therefore the maintenance of biodiversity. Appropriate fire regimes are necessary to conserve habitats and populations of species. Conversely, inappropriate use of fire can destroy habitats and cause local depletion or extinction of species. The survival of individual plants and ultimately species is affected by various attributes of a fire regime, particularly the intensity, seasonality, frequency and extent of bush fires.

The Service regards fire as a natural phenomenon, one of the established physical factors of the Australian environment. The management of fire for conservation purposes is evolving in line with scientific understanding of fire adaptations of native plants and animals. As previously mentioned (section 4.1.2), the Mangrove Mountain section is particularly important in this regard because it is believed to have not burnt for more than 30 years.

Under the Rural Fires Act 1997 the Service is a fire authority and is responsible for controlling fires on national parks and ensuring that they do not cause damage to neighbouring land or property. This responsibility includes the implementation of fuel management programs. The Service may also assist with the control and suppression of fires adjacent to the national park.

An important part of the Service's fire management is participation as a member of local bush fire management committees in the preparation of bush fire management plans which are required under section 52 of the Rural Fires Act 1997. Popran National Park is included within the area of the Gosford City Rural Fire District, which currently has a fire management plan under the Bush Fire Act 1949 which consists of a fuel management plan and an operational plan.

The Gosford City Fuel Management Plan includes a zoning plan for the management of fuels on a co-operative basis. The zoning plan defines treatment areas based on an assessment of the resource and the assets of an area.

The Service is committed to co-operative fire management and will prepare a reserve fire plan which complements the Gosford City Bush Fire Management Committee's Operational and Fuel Management Plans.

The following general principles will be applied in respect to fire management in Popran National Park:

- to reduce the risk of bushfire damage to life and property within and adjacent to Popran National Park;
- to effectively manage bushfires for the protection and conservation of the natural, cultural, scenic and recreational values of the park;
- to promote the effective and efficient utilisation of bushfire fighting resources through co-operative arrangements; and
- to achieve the earliest practical control of fires on Service lands.

Where possible wildfire, wildfire suppression and hazard reduction operations will be excluded from:

- closed forest communities in deep sheltered valleys along Popran Creek, Bedlam Creek and Hominy Creek;
- forest communities on the basalt intrusions;
- vegetation communities on alluvial soils along the river flats;
- the forest communities along Ironbark Creek; and
- the Mangrove Mountain section of the park.

In general the park will be managed to ensure that the minimum interval between fire events in any vegetation community will be at least 10 years, except for the area to the west of houses at Mount White where fuel reduction operations will be undertaken at more frequent intervals.

Policies

- * A fire management plan for Popran National Park will be prepared and placed on public exhibition by the end of 2000.
- * The management of fire in Popran National Park will be in accordance with the Service fire management plan for Popran National Park when prepared and the Gosford City Bush Fire Management Committee's Bush Fire Risk Management Plan.
- * The Service will provide continuing input into the preparation and implementation of the Gosford City Bush Fire Management Committee's Bush Fire Risk Management Plan in accordance with the requirements of the Rural Fires Act 1997.
- * Fire history records for the park will be updated and maintained for planning purposes.
- * The fire management plan for the park will be progressively updated to incorporate practices for the management of the habitat of native plants and animals in the light of new and relevant information.

- * Fire management in Popran National Park will aim to:
 - protect human life and property;
 - maintain biodiversity;
 - minimise fire in rainforest, blue gum forest, forest/open-forest and open forest communities;
 - protect closed forest, basalt forest and alluvial vegetation communities from fire;
 - protect the northern section of the park from fire; and
 - protect cultural heritage and recreation facilities.

- * Effective and efficient utilisation of district's fire fighting resources will be promoted through co-operative planning arrangements.

- * On-going liaison will be undertaken with park neighbours on co-operative fire management, and Community Fireguard programs promoted.

Action

- * A reserve fire management plan will be prepared for Popran National Park.

4.2 CULTURAL HERITAGE

4.2.1 Aboriginal Heritage

One of the major reasons for Popran National Park's dedication was the high density of Aboriginal sites it contains. Evidence of habitation is abundant and varied, and includes occupation deposits in sandstone shelters, foreshore middens, rock engravings, stone arrangements, paintings and axe grinding grooves. There are some 800 sites presently recorded in the park, with the majority being engravings and grinding grooves.

The area which is now park was occupied by Aboriginal people for at least 11,000 years. The park covers an area used by the Ku-ringai, Darkinjung and possibly also the Dharug people. It is believed to have been a travel route used by both inland and coastal Aboriginal groups. They often arranged reciprocal visits to exploit seasonally abundant food.

The Aboriginal sites within the park are an important part of present day Aboriginal culture. Popran National Park is located within the area of the Darkinjung Local Aboriginal Land Council. Discussions have been held with the Land Council on the management of a number of sites within the park in the past, and the Land Council wish to continue to be consulted on any proposals in regard to the management of Aboriginal sites within the park.

Vandalism of art sites has occurred in the region. Often the most effective way to protect sites from this kind of damage is not to reveal their location, however the locations of some art sites in the park are already widely known and regularly visited by interested members of the public. Some sites are also experiencing deterioration caused by changes in water flows and overgrowing vegetation. Some Aboriginal sites within the park will therefore require active management to prolong their existence.

The most well-known and visited art site in the park is "Upside Down Man Cave" near Ironbark Creek, which is listed in the Register of the National Estate.

Discussions have been held with the Darkinjung Local Aboriginal Land Council regarding the most appropriate means of protecting this site.

It is proposed that interpretive signs will be installed, and guided tours will be conducted to the cave during peak visitation times. Access is via private property and directions on how to find the site are deliberately not well publicised so as to limit visitor numbers and channel enquires through Service staff who can inform visitors of the need to protect the site.

Management of this and other sites within the park will continue to be undertaken in consultation with Darkinjung Local Aboriginal Land Council and relevant community groups.

Policies

- * Aboriginal sites and places will be recorded, conserved and interpreted in consultation with the Darkinjung Local Aboriginal Land Council and Aboriginal community groups.
- * Where an Aboriginal site is found to be rapidly degrading due to human impact or concentrated weathering appropriate action will be taken to protect the site in consultation with the Darkinjung Local Aboriginal Land Council.
- * The location of known Aboriginal sites will not generally be publicised, although appropriate information will be made available with consent of the Darkinjung Local Aboriginal Land Council, to relevant authorised researchers and for educational use.

Actions

- * A strategy to monitor the impact of visitor use on Aboriginal sites will be developed and action taken to restrict access where required to protect the site.
- * Discussions will continue to be held with the Darkinjung Aboriginal Land Council regarding the management of Upside Down Man Cave. Protective measures may be undertaken if necessary at the cave.

4.2.2 Historic Features

Limited logging of red cedar and large hardwoods was undertaken in the area from the early days of settlement until around 1980. Stumps of large trees remaining from this past use can be seen within the park.

Most of the alluvial flats along the Hawkesbury River and its associated tributaries were settled in the early 1800s. The land was primarily used for the growing of corn, vegetables and fruit which was transported to Sydney by boat. Some of the land along Popran and Ironbark Creeks was granted to convicts who had served their time. With increasing costs of transporting produce to the Sydney markets in the mid 1900s, most people moved away and many of these farms deteriorated.

A dam on Cascade Gully and a track known as the Mailmans Track are the only known historic structures remaining in the park. The dam was built of stressed concrete around 1920 as the water supply for Peat and Milson Islands. It is no longer in use and, although assessed as structurally sound, has been fenced to prevent access to the dam wall. The Mailmans Track was used in the mid 1800s to provide access from Gosford to the settlements along Mangrove Creek. In places some evidence of the old track remains.

A number of historic places and features are located just outside the park boundary. These include the wreck of H.M.A.S. Parramatta on the Hawkesbury River, the site

of the historic Green Man Inn at the mouth of Marlows Creek, and the site of the tent hospital for Aborigines with smallpox established in Hospital Gully in 1837.

Popran National Park occupies parts of two parishes, the Parish of Popran and Parish of Cowan. The present park includes a number of Crown Reserves which range in dates from 1895 to 1977 and were reserved for such diverse reasons as "Water Access", "Preservation of Native Fauna and Flora", "For the Promotion of Study of Native Flora and Fauna", and as "Timber Reserve (Forestry) No. 57244".

In 1976 an area at Mount White was proposed as an addition to Brisbane Water National Park. Nothing came of this proposal and in 1985 the National Parks Association (NSW) proposed the establishment of a Mt Olive Nature Reserve. It was not however until 1994 that Popran National Park was gazetted over an area which covered most but not all of the National Park Association's nature reserve proposal.

Policies

- * All historic places found on the park will be recorded and protected.
- * The provisions of the Burra Charter (ICOMOS, 1987) will guide management decisions for the cultural heritage in the park.
- * Research into the history of the park will be encouraged.
- * The history of past use of the park, including use of the Mailman's Track, will be interpreted on site.

Action

- * The history of the park will be included on park brochures and on park signs where appropriate.

4.3 USE OF THE PARK

Popran National Park will be managed to ensure that its use, whether by the general public, special interest groups, Service staff or other authorities, is appropriate and conforms with the management objectives and strategy of this plan.

The major categories of use that may be appropriate within Service areas are:

- * promotion of natural and cultural heritage conservation;
- * environmental education;
- * low-impact recreation in a natural setting;
- * scientific research; and
- * management operations by the Service and other public authorities.

The extent to which these categories of use are appropriate to Popran National Park are indicated below.

4.3.1 Promotion, Education and Interpretation

Promoting public awareness of the Service's conservation responsibilities, the values of the area and the recreational opportunities available is a major aspect of management of parks and reserves. It assists in the protection of the natural and cultural heritage and increases the understanding, enjoyment and satisfaction of visitors.

The recent gazettal of Popran National Park has meant that only a relatively low number of people, estimated by the District staff to be in the order of 5,000 per year, currently visit the park. The difficulties of accessing some sections of the park and the lack of major attractions mean that Popran National Park is expected to continue to experience a relatively low level of use for the foreseeable future.

It is intended that Popran National Park retain its low-intensity, isolated recreation qualities so as to provide a complementary experience to that provided in the more intensively used Metropolitan and Central Coast parks. Facilities in the park will therefore be limited and the park will not be heavily promoted.

Information on the park will be restricted to a few information boards and a park brochure. If further land is added to the park in the Bedlam Creek area, a short interpretive walking track may also be provided.

Educational groups such as schools, community groups and the Service's Discovery Program currently use the park on a limited basis. Such activities assist people in understanding the values of the park and the need for its continued protection and increase public enjoyment of the park. Such activities are particularly valuable in Popran National Park which has little on-site interpretation.

Policies

- * Popran National Park will be not be heavily promoted but retained as a place for self-reliant recreation in a natural setting.
- * Public understanding and appreciation of the natural and cultural heritage values of the park will be promoted through information boards at key locations, brochures and possibly an interpretive walk.
- * Educational programs and Discovery Ranger walks will continue to be supported as a means of increasing public understanding and enjoyment of the park.

Actions

- * Negotiations will be undertaken with Gosford Council to establish an information board on the park at the end of Ironbark Road and at Mooney Mooney Point.
- * If suitable additional land is added to the park in the vicinity of Bedlam Creek, an information board and interpretive signs will be provided.

4.3.2 Recreation Opportunities

Access to Popran National Park is currently limited. Public access is currently available:

- to the Mt Olive section of the park from the end of Ironbark Road and from Berecry Road;
- to the Bedlam Creek section of the park from the Wisemans Ferry Road;
- to the Calga section of the park from the Old Pacific Highway; and
- to the Mt White section of the park from the end of Morgans Road.

To limit damage to the environment, no public vehicular access will be permitted within the park boundaries. Most trails are already gated. It is proposed to erect a gate at the end of Ironbark Road just inside the park boundary, near the junction of the Mt Olive and 248 Trails, and to provide trackhead facilities and a watering point for horses. Horse gates will be installed to allow passage by horses and walkers but not vehicles.

There is no public access available to the Mangrove Mountain section of the park as it is surrounded by private property. The high nature conservation value of this northern section of the park warrants a very high level of protection. Therefore no public access will be permitted to this section of the park except for scientific research purposes.

Most public roads in the area, other than those mentioned above, terminate at private property or are freeways on which public vehicles are not permitted to stop. The Sydney-Newcastle Freeway restricts access to the southern section of the park.

Boating access to the park is also difficult as the main area of park fronting the Hawkesbury River consists of high cliffs, and the only other areas where the park meets water are in areas of extensive mangrove stands.

Although there are currently no recreation facilities in Popran National Park, recreational activities undertaken include bushwalking, picnicking, camping, cycling, horse riding, climbing and short walks to view the scenery. Some illegal four wheel drive and trailbike use also occurs in parts of the park.

The strategy for managing public use in Popran National Park is to provide recreational opportunities that are appropriate to a national park and complementary to those provided in other parks in the Central Coast region. A balance between the objectives of conservation and recreation must be found without compromising the significant values of the park. In catering for recreation, emphasis will be on low-intensity, self-sufficient use of the park.

Only two developed facilities are proposed for Popran National Park. A small carpark and composting toilet will be provided just inside the park boundary at the end of Ironbark Road. In addition, if suitable land is added to the park in the future, a small carpark and picnic area may be provided in the Bedlam Creek area off the Wisemans Ferry Road. The Bedlam Creek area is approximately midway between the townships of Spencer and Mangrove Mountain on a popular scenic drive.

There are very few sites within the park suitable for development as formal camping sites because of problems with water supply, firewood and access. Bush camping will be permitted away from roads, provided such camping is in accordance with minimal impact camping practices (including use of fuel stoves only) and in accordance with a camping permit issued by the Service.

Vehicle based camping is well catered for in the region - in Dharug National Park, Boudi National Park, Munmorah State Recreation Area and Watagan State Forest. There are also a large number of developed camping areas within the region which are owned by private enterprise or local councils. Consequently vehicle based camping will not be provided in Popran National Park.

There is a network of management trails in the central and southern sections of the park which provide walking access to creeks and areas from which good views are available. Only minor changes are proposed to the track system. The 248 Trail will be re-routed around the northern side of Portion 80 if necessary to provide access for walkers, horse riders and cyclists off the private land, and an existing walking track down to Emerald Pool on Hominy Creek will be upgraded and extended to provide a loop walk in the main section of the park (see map, centre pages).

Horse riding is currently undertaken in the Mt Olive section of the park by people from nearby properties, by those agisting horses on neighbouring properties and by people hiring horses from nearby riding schools. Horseriding for the Disabled also use the Mt Olive Trail for a special ride on one or two days a year. Horse riding can cause pollution of streams and increase weeds and erosion. To limit the

environmental impacts of horse riding, protect sensitive environments associated with water courses and keep horses off steep slopes, horse riding will only be permitted on the Mt Olive Trail, the 248 Trail and the Hominy Creek Trail. A water trough may be provided to protect the environment by reducing the need for access to creeks. A permit system, which will control the number of horses allowed in the park on any one day and provide some revenue towards maintenance of the horse tracks in the park, may be implemented if the number of horses using the park increases.

Popran National Park provides opportunities for bicycle touring on unsealed roads and management tracks in a bush setting. There are few alternative places that provide such an opportunity in the region. To minimise environmental damage and conflicts with walkers, no cycling will be permitted on walking tracks or off tracks, and no competition cycling will be permitted. Recreational cycling will however be permitted on management trails.

Rock climbing and abseiling occasionally occur in the park. Frequent use of a rock face can erode the rock and have impact on rare plants which frequently grow on these rock faces. To minimise environmental damage, no rock bolts will be permitted in the park and no commercial abseiling instruction will be allowed. People wishing to climb or abseil within Popran National Park will require permission of the District Manager in accordance with the National Parks and Wildlife Land Management Regulations.

A number of commercial groups have requested access to the park, including commercial cycling, horse riding and abseiling groups. Scouts and bushwalking clubs also use the park. Commercial and other large groups have a greater potential to impact on park management than do small groups. User conflicts, risks of accidents and injuries, and impact on natural and cultural heritage values all rise in direct proportion to the size of the group. All groups will be required to have a licence or consent from the Service and numbers, times and locations may be restricted so as to minimise impacts.

Policies

- * Popran National Park will be managed to provide a natural and isolated recreation setting which complements the opportunities available in other parks and reserves within the Central Coast region.
- * The environmental impact of recreation activities, particularly pack camping, the use of informal walking routes, horse riding and cycling, will be monitored and the activity may be prohibited if unacceptable impacts are indicated.
- * Conditions on recreation activities, including limits on numbers, times and locations, may be instituted where necessary to protect the park's natural and cultural heritage and to minimise conflicts of use.
- * All or part of the formal and informal walking track system, camping areas, horse trails and any other area showing evidence of over use, may be closed

permanently or temporarily to allow for their restoration. Consultation with user groups will be undertaken prior to such action where practical.

- * Bushwalking in accordance with the Minimum Impact Bushwalking Code and horse riding in accordance with the Service's Horse Riding Code of Practice will be promoted.
- * Bicycle touring will be permitted on the management trail system but not on walking tracks or off tracks.
- * Horse riding will be permitted only on the Mt Olive Trail, the 248 Trail and the management trail section of the Hominy Creek Trail (refer map, centre pages). Horse gates may be provided where necessary.
- * A water trough may be provided just inside the park boundary at the end of Ironbark Road.
- * The introduction of a permit system for horse riders will be considered if it becomes necessary to control the number of horses using the park.
- * If horse riding occurs off designated trails, horse riding on specific trails will be reviewed and may be limited.
- * Recreational activities by school groups, community and commercial organisations will require a consent agreement or commercial licence. Activities which pose a danger to other users, create a significant noise or other nuisance, or have an impact on the natural or cultural heritage will not be permitted.
- * Abseiling instruction, commercial horse riding, competitive cycling events and other activities which have the potential to have a high impact on the park will not be permitted.
- * Public vehicle access will be permitted only on public roads.

Actions

- * The Mt Olive and Emerald Pool walking tracks will be upgraded where necessary to prevent on-going erosion.
- * The track from Emerald Pool to the 248 track will be upgraded and signposted to provide a loop walking track.
- * The 248 Trail may be re-routed around the northern side of Portion 80.
- * A small car park and composting toilet will be provided just inside the park boundary at the end of Ironbark Road.
- * Ironbark Road will be gated at the carpark and horse gates installed.

- * Signs will be erected to mark designated horse trails and hitching rails will be established at the end of horse tracks.
- * A permit system may be developed for horse riding in the park.
- * The program of monitoring the impacts of recreational activities on the park will be continued.
- * A small parking area and picnic tables may be provided in the Bedlam Creek section of the park if suitable land is added to the park in future.
- * Negotiations will be undertaken with Gosford Council regarding the provision of an area where a limited number of cars can park off the edge of the road at the start of the Ironbark Creek and Popran Creek walking tracks.

4.3.3 Scientific Research

Scientific study in the park is directed towards improving the management of its natural and cultural heritage and the processes which affect them. Research is also used by the Service to establish the requirements for the management of particular species.

The Service does not presently have the resources to undertake any long term research in the park. A prospectus will be prepared as the basis for the involvement of research organisations in Popran National Park.

Policies

- * Scientific research which facilitates better management of the park will be encouraged.
- * Priority will be given to research into:
 - the ecology, status and distribution of native plant and animal species and communities;
 - the distribution and abundance of introduced species and their impact upon natural and cultural heritage;
 - biological control of introduced species;
 - the impact of various fire regimes on native species and communities;
 - the Aboriginal heritage; and
 - visitor use, perceptions and impacts on the park.
- * All research will be subject to Service policy and procedures for the granting of permits, conduct of research and the reporting of results.
- * Priority will be given to research applications which have the potential to facilitate the better management of the park.

- * Research on Aboriginal sites will only require the permission of and consultation with the Darkinjung Aboriginal Land Council.

Action

- * A prospectus will be prepared and circulated to research and educational institutions as a guide to preferred research projects in the park.

4.3.4 Management Operations

Popran National Park contains a network of management trails used primarily for access to power lines, telephone lines, Gosford water pipeline and the Sydney-Newcastle gas pipeline constructed and operated by other authorities. The management trail system also provides access for bush fire management. The management trail system is shown on the map, centre pages.

The management trail system in the park will only be available for use by designated authorities. No private access to properties at Big Jims Point or other waterfront areas will be permitted.

The park also contains one trail which was excluded from the park and provides access to a property at Marlows Gully. This trail, which is gated at the park boundary under an agreement with the owners of the property, is also used for management purposes and will not be available for general public use.

Small quarries which pre-date the park are located on the Popran Creek and Ironbark Creek management trails. These will be used for maintenance of the park management trail and walking track system.

Policies

- * It is a long term aim of the Service to reduce the number of, and if possible eliminate, non-park occupancies held under lease, license or other form of consent within the park. Such occupancies will be kept under regular review and where appropriate the facility or occupancy will be relocated, closed or terminated and the site rehabilitated.
- * Non-park uses and facilities will be managed in accordance with the principles and objectives of this plan and in accordance with the conditions of a lease, licence or agreement document.
- * The system of management trails outlined on the map in this plan will be maintained by the Service or other authorities for fire management, pest species management, servicing of power lines and pipe lines and other authorised management purposes.
- * The use of management trails for public or private access will not be permitted.

- * Tracks and trails within the park which are not part of the authorised management trail or walking track system will be closed and rehabilitated.
- * Gates and fencing will be erected where necessary to prevent unauthorised access into the park. All management trails will be signposted and gated.
- * Subject to environmental assessment, continued use of existing quarries to obtain construction material will be permitted in accordance with an approved extraction program and will be limited to that required for the Service's own use in the park.

Actions

- * Tracks and trails not part of the management trail system will be closed and rehabilitated.
- * Signs will be erected near all gates to the national park identifying the park and explaining any restrictions on access.
- * An extraction operations plan and appropriate review of environmental factors will be prepared for each quarry in the park and will include a program of restoration of the quarries.
- * A lease, licence or management agreement will be prepared for all facilities and access trails within the park not currently subject to a lease, licence or management agreement.

5. PLAN IMPLEMENTATION

This plan of management is part of the system of management developed by the National Parks and Wildlife Service. The system includes the National Parks and Wildlife Act, the Service's Corporate Plan, associated strategies and management policies. It also includes regional strategic planning.

The orderly implementation of this plan of management will be undertaken within the annual programs of the Service's Central Coast Region. Priorities will be determined during the development of these programs and will be subject to regional priorities, the availability of funding and staff and to any specific requirements of the Director General or the Minister.

Regional programs are subject to on-going review within which works and any other activities carried out in Popran National Park will be evaluated in relation to objectives laid down in this plan.

The environmental impact of all development proposals will be assessed in accordance with established environmental assessment procedures.

In accordance with Section 81 of the National Parks and Wildlife Act this plan shall be carried out and given effect to and no operations shall be undertaken in relation to Popran National Park unless those operations are in accordance with the adopted plan of management. If after adequate investigation operations not included in the plan are found to be justified, the plan may be amended in accordance with Section 75 of the Act.

The management proposals outlined in the plan have been summarised and their priorities for implementation are set out in the following table.

PRIORITIES FOR THE IMPLEMENTATION OF ACTIONS IN THE PLAN

Action	Priority	Plan Reference
Map threatened and uncommon plant species and identify threatening processes identified.	High	4.1.2
Prepare feral animal control plan	High	4.1.3
Undertake foxes and dog control	High	4.1.3
Prepare fire management plan	High	4.1.4
Update fire history records	High	4.1.4
Update register of Aboriginal sites	High	4.2.1

Monitor impacts of visitor use on Aboriginal sites	High	4.2.1
Install gates, carpark, composting toilet and signs at the end of Ironbark Road.	High	4.3.2
Erect signs to designate horse trails	High	4.3.2
Continue recreation monitoring program	High	4.3.2
Encourage monitoring of the impacts of water extraction	Medium	4.1.1
Research ecology of the northern section of the park	Medium	4.1.2
Prepare information on importance of conserving vegetation	Medium	4.1.2
Prepare weed control strategy	Medium	4.1.2
Map endangered animal species	Medium	4.1.3
Map introduced animal species	Medium	4.1.3
Discuss management of Upside Down Man Cave with Darkinjung Aboriginal Land Council.	Medium	4.2.1
Re-route 248 track around Aboriginal site and Portion 80	Medium	4.3.2
Negotiate re an information board at Mooney Mooney Point.	Medium	4.3.1
Upgrade Mount Olive and Emerald Pool walking tracks	Medium	4.3.2
Upgrade track from Emerald Pool to the 248 track	Medium	4.3.2
Negotiate re parking at the start of the Ironbark Creek and Popran Creek walking tracks.	Medium	4.3.2
Close and rehabilitate tracks not part of the management trail system	Medium	4.3.4
Erect signs near park gates	Medium	4.3.4
Prepare extraction operations plan for quarries	Medium	4.3.4
Negotiate leases, licences or management agreements for alien tenures	Medium	4.3.4
Prepare research prospectus	Low	4.3.3

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