

GARIGAL NATIONAL PARK
PLAN OF MANAGEMENT

NSW National Parks and Wildlife Service

As amended in December 2013

A plan of management for Garigal National Park was adopted by the Minister for the Environment on 24 November 1998. Amendments to the plan were adopted by the Minister on 9 December 2013.

This plan combines the 1998 plan with the amendments adopted in 2013.

Acknowledgements

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FOREWORD

Garigal National Park covers over 2000 hectares of bushland in northern Sydney. It comprises the valley of Middle Harbour Creek and its tributaries, the slopes along the northern side of Middle Harbour as far as Bantry Bay and part of the catchment of Narrabeen Lakes.

Garigal National Park has a wide variety of vegetation, and serves as a refuge for native plants and animals including many threatened and uncommon species. It also includes several significant Aboriginal sites and historic places, including the Bantry Bay explosives magazine complex. This makes it an important area for environmental education. It is also an important recreational resource and provides the opportunity for experiencing "the bush" close to the centre of Sydney.

This plan of management will ensure that important natural and cultural heritage of Garigal National Park will be conserved. Information about the natural and cultural heritage of the park will be provided by means of interpretive displays in the Roseville Bridge area. The co-operation of relevant State and local government authorities, the Aboriginal community, neighbours and community groups will be sought to assist in protecting and enhancing the park.

The plan also sets a framework within which recreational use of the park will continue. Walking tracks will be upgraded where necessary, horse riding will continue to be permitted on authorised trails, picnic facilities at Davidson Picnic Area will be upgraded, and toilets will be provided near the Roseville Bridge boat ramps. Appropriate community use of explosives magazine buildings will be investigated, including commercial options, in order to provide funds for their conservation.

This plan of management establishes the scheme of operations for Garigal National Park. In accordance with Section 75 of the National Parks and Wildlife Act 1974, this plan of management is hereby adopted.

PAM ALLAN

**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 procedures for the preparation of a plan of management are specified in the Act and involve five stages:

- * 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 any person may comment on it.
- * The plan and copies of all representations are referred to the National Parks and Wildlife Advisory Council for consideration.
- * The Director-General submits the plan, together with the recommendations of the Advisory Council, to the Minister.
- * The Minister may adopt the plan after considering the recommendations of the Advisory Council or may refer the plan 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 national park except in accordance with the plan.

A plan of management for Garigal National Park was placed on public exhibition for a period of three months from February through April 1996. During this time the plan attracted 63 submissions covering 20 issues. All comments received were referred to the Advisory Council along with the plan, for its consideration and advice. The comments and suggestions of the Advisory Council were in turn considered by the Minister in adopting this plan.

The planning process leading to the development of this plan has involved the collection and use of a large amount of information. For additional information or enquires on the management of Garigal National Park, please contact:

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2. MANAGEMENT CONTEXT

2.1 NATIONAL PARKS IN NEW SOUTH WALES

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

The International Union for the Conservation of Nature and Natural Resources (IUCN) in 1994 defined a national park as:

"a natural area of land/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 the spiritual, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible."

National parks are 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, for example, agriculture, forestry and mining, are distinguished by an acceptance or encouragement of environmental modification. National parks, therefore, provide for only a limited part of the range of land uses in a region.

2.2 GARIGAL NATIONAL PARK

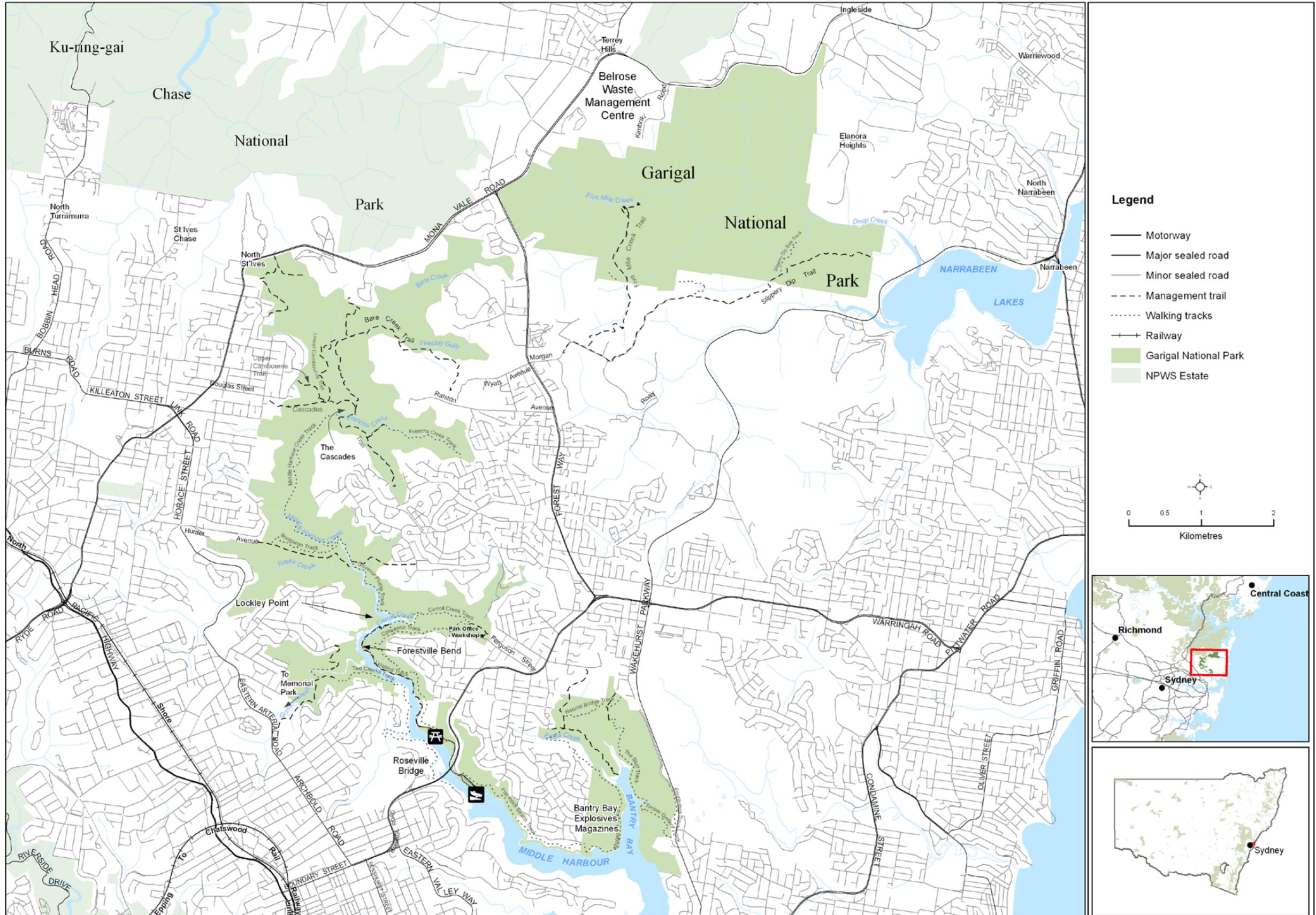
2.2.1 Location, History of Dedication and Regional Context

Garigal National Park is a large area (2150 hectares) of bushland in the Sydney Metropolitan Area (see Map 1). It embraces the upper reaches of Middle Harbour, including Bantry Bay, and part of the catchment of Narrabeen Lakes.

Much of the park is bounded by residential development along the ridge tops and it is easily accessible at numerous points by road and water. Several other conservation reserves and areas of bushland are adjacent or close by Garigal National Park, including Ku-ring-gai Chase National Park, Sydney Harbour National Park, Manly Warringah War Memorial Park (commonly known as Manly Dam Reserve) and a number of areas of Crown land and other reserves in Warringah, Ku-ring-gai and Willoughby local government areas.

The Middle Harbour area of the park was first reserved for public use in 1923. There were a number of subsequent additions and in 1976 the area became a state recreation area. The Narrabeen Lakes area was reserved as Garigal National Park in 1991 and in 1992 the former Davidson Park State Recreation Area was included within Garigal National Park. Further additions to the park in the Narrabeen Lakes area are proposed and these lands if added will be managed in accordance with the objectives and policies in this plan of management.

Map 1 Garigal National Park



2.2.2 Importance of Garigal National Park

Garigal National Park is one of a large group of sandstone national parks and reserves in the Sydney Basin which includes Royal, Nattai, Ku-ring-gai Chase, Lane Cove, Blue Mountains, Kanangra-Boyd, Wollemi, Yengo and Dharug National Parks. Garigal provides a link between Sydney Harbour National Park, Manly Dam Reserve and Ku-ring-gai Chase National Park, which in turn lie close to national parks to the north and west. This greatly enhances the viability of the natural systems of each area.

The major values of Garigal National Park are briefly described below.

Natural Features

The park has a varied landform of broad ridges, steep slopes and deep valleys with areas of sandstone outcrop, cliffs and wetland. The variety of physiographic conditions has resulted in a high diversity of vegetation types within a relatively small area ranging from dry heath to moist forest with rainforest elements.

Several of the plant communities found in Garigal National Park are remnants of formerly widespread vegetation types and have local and regional conservation significance. In particular the sandstone swamp, mallee woodlands containing *Eucalyptus luehmanniana*, floodplain wetlands, rainforest and vegetation on lateritic and shale soils have a restricted distribution in the Sydney area. Most of the vegetation found on lateritic and shale soils, called the Duffys Forest community, has been cleared in the district. This community is the only one in which the threatened *Grevillea caleyi* occurs and it has recently been listed as an endangered ecological community under the Threatened Species Conservation Act 1995.

Other threatened plant species occurring in the park include *Haloragodendron lucasii*, *Leptospermum deanei*, *Bertya brownii*, and *Tetratheca glandulosa*. The *Haloragodendron lucasii* community is the bigger of only two known remaining stands. The park contains major populations of *Tetratheca glandulosa* and is of vital importance for conservation of this species.

A number of other restricted or regionally uncommon species also occur in the park, including *Eucalyptus luehmanniana*, *E. squamosa*, *E. scias*, *Angophora crassifolia*, *Darwinia procera*, *Lomandra fluviatilis*, *L. brevis*, *Melaleuca deanei*, *Allocasuarina nana*, *Hibbertia nitida*, *Pultenea hispidula*, *P. microphylla*, *Pseudanthus pimeleoides*, *Platysace stephensonii*, *Acianthus caudatus*, *Chiloglottis reflexa*, *C. trapeziformis*, *Corybas undulatus*, *Genoplesium baueri*, *Pterostylis daintreana*, *Symphionema paludosum*, *Sprengelia incarnata*, *Rimacola elliptica* and *Patersonia sp aff fragilis*. Garigal National Park is important for conservation of *Darwinia procera* and *Eucalyptus luehmanniana*, as it contains major populations of these species, and for the conservation of *Angophora crassifolia* which is restricted to the Ku-ring-gai plateau (Sheringham and Sanders, 1992).

Garigal National Park includes the largest part of the Sydney Harbour catchment which is in a fairly natural condition. The mangrove and seagrass communities in Bantry Bay, while not within the park boundaries, are significant within Sydney

Harbour because of their health and size. They are protected by retention of the adjacent bushland in the park.

The park provides a variety of habitats and is important for conservation of local populations of a wide range of native animal species.

Threatened animal species recorded include the southern brown bandicoot *Isodon obesulus*, common bent wing bat *Miniopterus schreibersii*, tiger quoll *Dasyurus maculatus*, osprey *Pandion haliaetus*, glossy black cockatoo *Calyptorhynchus lathami*, powerful owl *Ninox strenua* and broad-headed snake *Hoplocephalus bungaroides*.

Aboriginal Heritage

There are nearly 100 recorded Aboriginal sites within the park including art sites, occupation sites and rock engravings. Many of the sites are undisturbed and are important surviving examples of Aboriginal occupation of the Sydney Region.

One large rock engraving site has more than 80 separate figures. It is believed to be the group noted by White in 1788 during an expedition led by Governor Arthur Phillip (see 4.2.2) - the first seen by Europeans in Australia. It was also identified by geologist Etheridge in 1890 and by W.D. Campbell in his 1899 treatise on Aboriginal Carvings of Port Jackson and Broken Bay. It is one of the most important surviving sites in the Sydney area.

Some engraving sites contain large whale motifs. These are an uncommon feature and may have been culturally significant.

The shelter art sites include some hand stencils and motifs in two colours, both of which are quite rare in the Sydney Region. The occupation shelters have high archaeological potential and are very important as most sites in the district have been destroyed by development (Gunn, 1992).

Bantry Bay contains one of the oldest known Aboriginal occupation sites in Sydney Harbour, which establishes the fact that there has been habitation of the area for at least the last 4,600 years (Latona Masterman and Associates, 1982).

As well as their value for archaeology, research and education the sites are important to the contemporary Aboriginal community as evidence of Aboriginal culture.

Historic Heritage

The park contains several places and features of historic interest and two highly significant sites. One of these is Bungaroo at the tidal limit of Middle Harbour Creek, where Governor Phillip camped for two nights in 1788 on his first expedition. Bungaroo is the only site described in the journal of this expedition which has been accurately identified. It is now possibly the only location directly connected with very early European exploration that remains in the condition seen by Phillip and his expedition and retains the atmosphere described by Surgeon White.

The other significant site is the former Bantry Bay Explosives Magazine complex which was used for commercial explosives storage. It is the only example of an explosives magazine complex in NSW and the design of the buildings, site layout and location clearly indicate the principal functional requirements of this potentially hazardous industrial activity. It maintained a unique and important maritime function with a distinctive fleet of vessels and associated wharfing and lightering functions. Many of these activities have now disappeared from Sydney Harbour.

The explosives magazine has historical significance for its role in urban and industrial growth, as part of the industrial technological history of explosives and as an example of government participation in a transport and storage industry.

The buildings on the western side of Bantry Bay are architecturally significant both for their rare and specialised design and as examples of the public utility architecture of Federation Sydney, most of which is now either gone or threatened. The buildings have a high degree of architectural unity and rarity. They have been classified by the National Trust (1975) and listed in the Australian Heritage Commission's Register of the National Estate (1977). A detailed description of their significance is set out in the conservation plan for Bantry Bay (Conyers and Le Maistre, 1991).

Bantry Bay as a whole, through its role as a reserve for the storage of explosives and earlier as a staging point for the supply of timber, played an important part in the establishment of Sydney as Australia's premier port and in Sydney's growth in the early twentieth century.

Bantry Bay is the last deepwater inlet to retain a character similar to when Captain Arthur Phillip sailed his fleet through the Heads of Port Jackson (Sydney Harbour) in 1788.

Scenery

The park is a pleasant visual break between the urban landscapes to its east and west. The steep forested slopes provide a magnificent backdrop to the waterways of upper Middle Harbour and are a significant asset to Sydney. Parts of the Middle Harbour Creek and Deep Creek areas and the steep vegetated slopes of Bantry Bay give an impression of natural bushland rare within a city as large as Sydney.

There are extensive views of bushland and across Narrabeen Lakes to the ocean from high points around the park and from the walking tracks. A variety of smaller scale natural features add greatly to the area's scenic attractiveness. The natural feeling is enhanced because most of the ridge lines are naturally vegetated, although not all are within the park.

Recreation

Garigal National Park has a significant recreational role because of its urban location and large number of entry points. In particular it provides easily accessible outdoor recreation opportunities for residents of the north shore, Pittwater and Manly-

Warringah areas. The park complements similar opportunities provided in Ku-ring-gai Chase, Lane Cove and Sydney Harbour National Parks, Manly Dam Reserve and the water-based opportunities of Sydney Harbour, Narrabeen Lakes and nearby beaches.

The park and the adjacent waterways provide a quieter, more natural and less crowded recreational experience than nearby Lane Cove and Sydney Harbour National Parks.

The northern sections of Garigal allow a sense of escape from the city and the park provides both short and long walking and horse riding opportunities which are easily accessible. Easily accessible mountain bike riding is also provided for in Garigal National Park. This activity will be enhanced by the purpose-built track proposed for construction in the Bantry Bay area of the park. There are opportunities to link tracks in the park to adjacent natural areas, thus creating a district track network.

The park provides opportunities for swimming, boating and canoeing in a natural setting with sandy beaches and both semi-natural and bushland settings for picnics.

The boat ramp area at Roseville Bridge is a major access point to the Middle Harbour waterways.

Education

The park is easily accessible by road and water, and only 8-15 kilometres from the centre of Sydney. It contains a large variety of plant communities, a number of significant historic places and an extensive and well-known Aboriginal rock engraving site. A comprehensive system of walking tracks enables visitors to explore all parts of the park.

These features make the park valuable for educational purposes, in particular for the many schools within walking distance of the park. It also provides opportunities for the people of Sydney to informally learn about the natural environment and history of Sydney.

Statement of Significance

Garigal National Park is one of a number of large reserves in the Sydney area protecting samples of the natural and cultural environment of the region. Its conservation significance is summarised below.

Garigal National Park is important because it:

- protects remnant urban bushland in the Sydney metropolitan area with a variety of vegetation communities;
- forms part of an important wildlife corridor extending from Sydney Harbour to the Blue Mountains via the Hawkesbury-Nepean Rivers;
- contains a large number of threatened native plants, including significant populations of some species and a threatened vegetation community;
- provides habitat for a wide range of native animal species, including a number of threatened species;
- contains one of the oldest known Aboriginal occupation sites for Sydney Harbour;
- contains one of the most extensive areas of Aboriginal rock engravings in the region;
- protects in a natural condition a location which is documented in very early exploration of the Sydney area;
- contains a number of locations connected with early settlement of the Sydney area and industrial use of Sydney Harbour;
- contains the only example in NSW of a private explosives magazine complex;
- contains a good example of the public utility architecture of Federation Sydney, much of which has been lost;
- has a number of significant natural and cultural features of educational interest close to the centre of Sydney; and
- provides opportunities for a variety of recreation activities in a natural environment within the Sydney urban area.

3. OBJECTIVES OF MANAGEMENT

3.1 GENERAL OBJECTIVES FOR NATIONAL PARKS

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

- * protection and preservation of scenic and natural features;
- * conservation of wildlife;
- * maintenance of natural processes as far as is possible;
- * preservation of Aboriginal sites;
- * conservation of historic features;
- * provision of appropriate recreation opportunities; and
- * encouragement of scientific and educational inquiry into environmental features and processes, prehistoric and historic features and park use patterns.

3.2 SPECIFIC OBJECTIVES FOR GARIGAL NATIONAL PARK

In addition to the above general objectives, the management of Garigal National Park will be subject to the following specific objectives:

- * preservation of threatened species, populations and ecological communities;
- * protection of the park from soil erosion, siltation, pollution and visual impacts;
- * rehabilitation of degraded areas affected by soil erosion, vegetation damage, illegal dumping and weed invasion;
- * conservation and appropriate use of the Bantry Bay Explosives Magazine;
- * provision of recreation opportunities which allow a sense of escape from urban areas and complement those available elsewhere in the district; and
- * provision of opportunities for visitors to learn about the natural and cultural heritage of the park and promotion of appreciation of the values of the park in the community.

3.3 OVERALL STRATEGY

Garigal National Park will be managed as a significant bushland area within urban Sydney. It is recognised that the park's conservation, landscape and recreation values are greatly affected by the actions of other land use authorities and neighbours. Close liaison will be maintained with relevant state and local government agencies, community organisations and neighbours.

Priority will be given to conservation of the park's special values by:

- control of pollution and weeds by contributing to catchment management plans and preparing a weed management plan;
- encouragement of protection of catchment values and natural views by liaising with appropriate authorities, organisations and neighbours regarding the protection of adjacent naturally vegetated ridge tops;
- conservation of threatened species, populations and ecological communities by protection and appropriate fire management; and
- conservation of Aboriginal and historic sites by protection and appropriate interpretation.

Recreational use will be primarily focussed on the existing picnic and boat ramp area at Roseville Bridge and the walking tracks that cover most parts of the park and identified mountain bike and horse riding opportunities.

4. POLICIES AND FRAMEWORK FOR MANAGEMENT

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

- NATURAL HERITAGE
- CULTURAL HERITAGE
- USE OF THE AREA

The policies established in this plan of management will provide the framework for management consistent with anticipated resources available to the Service and anticipated community trends for the next five to ten years. Management will also be in accordance with the Service's Field Management Policies which are not repeated in the plan.

The actions identified in the plan are those immediate proposals which are to be undertaken in the next five years. Other management actions may be developed over the life of this plan consistent with the policies set out in the plan.

4.1 NATURAL HERITAGE

Natural heritage comprises all aspects of the natural environment including physical features such as geology and soils, plants and animals and the relationships between these. For convenience, management of landscape values and of fire are also considered in this section as these relate primarily to natural features.

4.1.1 Geomorphology, Soils and Water Quality

The park consists of two distinct areas within the catchments of Middle Harbour and Narrabeen Lakes.

The western part of the park is a deep north-south valley containing Middle Harbour Creek and a number of tributary east-west valleys drained by Bare, Frenchs, Carroll, Rocky and Gordon Creeks. Numerous sandstone ridges protrude into the main valley and cliffs and rocky outcrops are a common feature. Middle Harbour Creek is a permanent stream which is fresh water upstream of Bungaroo. South of the tidal limit the creek merges with upper Middle Harbour, part of the drowned river valley of Sydney Harbour.

From the Roseville Bridge picnic area southwards the park is characterised by steep slopes ranging from 100m to 150m high along the northern shore of Middle Harbour. The southern limit of the park is Bantry Bay. This is a deep valley encompassing two permanent creeks, with steep slopes and high ridges.

The north-eastern section of the park comprises most of the catchment of Deep Creek and part of the Middle Creek catchment, both of which flow into Narrabeen

Lakes. This area consists of broad ridges and steep slopes with extensive benching and rock outcrops.

The park lies predominantly on Hawkesbury sandstone, a massive Triassic sandstone which covers large areas of the Sydney Basin. Minor shale lenses occur in the sandstone and several Jurassic igneous intrusions cross the area. There are extensive siliceous sands of Quaternary alluvium along the lower reaches of Deep Creek and Middle Creek.

Soils derived from the sandstone are primarily shallow and sandy, and on moderate and steep slopes are highly erodible, especially after disturbance. Areas of poor drainage occur on ridge tops and benches. Track construction and fire management practices must minimise soil disturbance and include erosion mitigation works. It is also necessary to control damaging use such as horse and bicycle riding in steep or poorly drained areas. This is covered in section 4.3.2.

Soils in the creek valleys are deeper and are vulnerable to weed invasion. Clay/loam soils derived from the shale lenses and igneous intrusions are more fertile than the sandstone soils and support distinctive vegetation.

Apart from some minor catchments, and limited areas along the northern boundaries, all of the watercourses within the park originate inside areas of urban development. These areas have been subjected to intensive disturbance, which has given rise to greatly accelerated erosion, siltation and ongoing nutrient pollution of the park's watercourses from stormwater runoff and discharges from sewerage surface fittings.

Major pollution sources are the Bare Creek Waste Disposal Site, former St Ives tree loppings tip, Belrose Waste Management Centre and a sand quarry west of Forest Way. Numerous pedestrian, horse and vehicle tracks within the park also contribute to degradation of water quality. Closure of unnecessary tracks is provided for in sections 4.3.2 and 4.3.4.

Water quality problems are most apparent in Middle Harbour Creek and its tributaries above the tidal limit at Bungaroo. The once popular swimming area of the Cascades is now heavily polluted and subject to unsightly turbidity and weed growth. Below Bungaroo siltation has reduced water depth in recent years. Water quality is acceptable for swimming in the Roseville Bridge picnic area swimming enclosure except following heavy rain.

Deterioration of water quality and increased siltation of creeks has had a significant impact on native plant and animal communities, weed species infestation and recreational values. Siltation has significantly affected mangrove communities at the head of Bantry Bay and sediment deposition along the flood plain of Deep Creek, primarily from the Belrose Waste Management Centre, is resulting in rapid filling and weed invasion of the important wetlands in this area. Gross pollution by rubbish also occurs below Belrose Waste Management Centre and the Bare Creek Waste Disposal Site.

At present approximately half of the bushland in the park is likely to suffer significant deterioration as a result of on-going urban pollution unless this is ameliorated by measures such as gross pollutant traps, storm water retention, siltation traps, low-flow diversion pipes and biological filters. If the large areas of Crown land adjacent to the park are developed only about a quarter of the area's bushland will remain in good condition unless the above measures are incorporated (Halpin et al, 1983).

The Service is a member of the Middle Harbour and Sydney Northern Beaches Catchment Management Committees, which are developing catchment management plans for the areas around the park.

Policies

- * All works carried out in the park will incorporate soil erosion and sedimentation control principles and practices developed by the Soil Conservation Service.
- * Areas subject to soil erosion arising from recreation or management use will be rehabilitated.
- * The co-operation of relevant land use authorities, total catchment management committees and neighbours will be sought to prevent pollution of streams within the park from land use and development in their upper catchments, and improve water quality to minimise the spread of weeds and protect the habitat of aquatic plant and animal species.

Actions

- * The Service will assist the Middle Harbour and Sydney Northern Beaches Catchment Management Committees in the development of catchment management plans for Middle Harbour and Narrabeen Lakes.
- * In association with preparation of catchment management plans, educational material will be circulated to park neighbours to increase awareness of their role in erosion management and water quality issues.

4.1.2 Native and Introduced Plants

Native vegetation communities

The vegetation of the park is typical of the sandstone country of the Sydney area. A number of vegetation surveys have been carried out and a total of 24 plant communities have been identified comprising around 500 species.

Vegetation types include heath, hanging swamps, woodland, open forest, tall open forest and rainforest.

Dominant species in the forests and woodland on sandstone are scribbly gum *Eucalyptus haemastoma*, bloodwood *Corymbia gummifera* and smooth-barked apple

Angophora costata, with Sydney peppermint *E. piperita*, black ash *E. sieberi* and grey gum *E. punctata* on sheltered slopes. In moist gullies blackbutt *E. pilularis* and turpentine *Syncarpia glomulifera* appear. These grade into black wattle *Callicoma serratifolia*, water gum *Tristania laurina*, pittosporum *Pittosporum undulatum*, blueberry ash *Elaeocarpus reticulatus* and coachwood *Ceratopetalum apetalum* in the most sheltered sites.

An unusual community in the park is mallee woodland dominated by the yellow-topped mallee ash *Eucalyptus luehmanniana*. Bloodwood *Corymbia gummifera*, sandstone stringybark *Eucalyptus oblonga* and a range of shrubs also occur in this community.

Shrubland is widespread on sandstone in the Narrabeen Lakes catchment, with a diverse range of species varying with soil drainage. In dry areas shrubs such as she oak *Allocasuarina distyla*, heath myrtle *Baeckea brevifolia*, heath-leaved banksia *Banksia ericifolia* and pink buttons *Kunzea capitata* are common, with scattered trees. In poorly drained areas *Banksia ericifolia*, *Hakea teretifolia*, pink tea tree *Leptospermum squarrosum*, *Sprengelia incarnata*, *Leptocarpus tenax*, *Schoenus paludosus* and a variety of other shrubs and sedges occur.

On the more fertile lateritic and shale soils on the northern edge of the park communities of *Eucalyptus sieberi*, *Corymbia gummifera*, *Angophora costata*, brown stringybark *E. capitellata* and white mahogany *E. umbra* ssp. *umbra* have developed, with shrubs such as *Acacia myrtifolia*, *Bossiaea obcordata*, *Lambertia formosa* and *Pultenaea daphnoides*.

On alluvial areas along Middle Creek, Deep Creek and Middle Harbour Creek are a variety of communities including forests dominated by swamp she-oak *Casuarina glauca*, *Melaleuca lineariifolia*, *Melaleuca styphelioides* or bangalay *Eucalyptus botryoides* and freshwater wetlands of sedges and reeds such as *Baumea juncea*, *Triglochin procera*, *Schoenus brevifolius* and *Phragmites australis*. Most of these are on land proposed for addition to the park.

Threatened native plant species

Threatened plant species occurring in the park include the endangered *Haloragodendron lucasii* and *Grevillea caleyi*, and the vulnerable *Leptospermum deanei*, *Bertya brownii* and *Tetradlea glandulosa*.

The community found on lateritic and shale soils, called the Duffys Forest community, has recently been listed as an endangered ecological community under the Threatened Species Conservation Act. *Grevillea caleyi* is restricted to this vegetation community.

Under the Threatened Species Conservation Act 1995 a recovery plan and/or threat abatement plan must be prepared for threatened plants and animals. The purpose of a recovery plan is to promote the recovery of a threatened species, population or ecological community with the aim of returning the 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. To date, recovery plans have been prepared for the conservation of *Haloragodendron lucasii* and *Grevillea caleyi*.

The *Haloragodendron lucasii* community is subject to stormwater inundation and threatened by weed invasion. It needs a bush regeneration programme and control of urban runoff to ensure its long term viability.

Leptospermum deanei occurs on alluvial areas along the creeks and is therefore affected by changes in water quality. Catchment management works as discussed in section 4.1.2 will assist its conservation.

Research indicates that *Grevillea caleyi* requires a fire free period of 8-12 years to enable plants to produce seed and that up to 20 fire free years may be needed for maintenance of populations. As most populations are located outside the park, conservation agreements are needed with landowners.

Most of the other threatened species populations are depleted by fire or their sensitivity is not known. A fire free interval of at least 12 years appears to be necessary for their conservation.

As well as the species listed as threatened, there are approximately 30 plant species of concern within the park. Some of these, such as *Lomandra fluviatilis*, occur along water courses and are therefore threatened by water pollution, sediment deposition and weed invasion.

Weeds

The long, angular boundary of the park and the presence of adjoining suburban development, rubbish tips and other developments have resulted in invasion of exotic species in many areas, particularly along drainage lines, easements, tracks and boundaries with development. Many of the areas of weeds are well established and will not readily be controlled. The area affected by weed invasion will be increased by development of Crown land adjacent to the park.

Species of greatest concern are camphor laurel *Cinnamomum camphora*, large-leaved privet *Ligustrum lucidum*, small-leaved privet *Ligustrum sinense*, lantana *Lantana camara*, rhus *Rhus succedanea*, cassia *Senna pendula*, crofton weed *Ageratina adenphora*, mistflower *Ageratina riparia*, pampas grass *Cortaderia selloana*, blackberry *Rubus fruticosus*, bitou bush *Chrysanthemoides monolifera*, wandering Jew *Tradescantia albiflora* and Japanese honeysuckle *Lonicera japonica*.

Isolepis prolifera, *Ludwigia peruviana* and other species are serious threats to the important wetlands along Deep Creek and it is essential that removal take place before they spread further.

Because of the extent of weed infestation and staffing and financial constraints, assistance in weed control by volunteers will continue to be pursued.

An education programme advising neighbours and authorities of the importance of avoiding the entry of exotic species, and means of control, is also important if weeds

in the park are to be controlled. In particular, control of exotic species around the Monash Country Club and Belrose Waste Management Centre are needed. However, simple removal of weeds is not sufficient for long term control. Water quality management is fundamental to reduction in the rate of weed species spread and encouragement of native vegetation, as discussed in section 4.1.1.

Policies

- * As far as possible, the native vegetation of Garigal National Park will be managed to ensure the conservation of all indigenous plant species, communities, and structural types.
- * Threatened species, populations and ecological communities, and other uncommon communities, will be protected from disturbance and managed to maximise their long term conservation.
- * Infestations of weed species will be controlled or eradicated where possible. Priority will be given to control of weeds where they:
 - threaten the survival or integrity of important native plant communities or threatened species, populations and ecological communities;
 - are species which invade undisturbed native plant communities;
 - are isolated occurrences which have the potential to spread rapidly; or
 - are declared noxious under the Noxious Weeds Act 1993.
- * Weed control programmes will have regard to requirements for retention of cover for native animals and prevention of erosion.
- * Public authorities undertaking work in the park will be required to minimise disturbance to native vegetation, to avoid introducing and facilitating the distribution of exotic species, and to rehabilitate to the Service's satisfaction any damage that results from the activity.
- * All new plantings in the park will be propagated from locally indigenous stock.
- * Development of conservation agreements for areas of bushland adjacent to the park will be encouraged.

Actions

- * A weed management plan identifying priorities and strategies for weed control, including volunteer bush regeneration programmes and community education, will be prepared and implemented.
- * The co-operation of Warringah and Pittwater Councils will be sought for removal of weeds from parts of the Deep Creek and Middle Creek flood plain which are proposed to be added to the park and from lands adjacent to the Belrose Waste Management Centre.

- * The *Haloragodendron lucasii* community will be protected against urban stormwater runoff and protected from weed encroachment.
- * Threatened species with vulnerable habitat within the park will be identified and local species management plans will be progressively prepared.

4.1.3 Native and Introduced Animals

The high structural and floristic diversity of the park's vegetation, in combination with adjacent estuarine wetlands, is reflected in the diversity of native animals. Approximately 18 native mammal species, 160 bird species and 23 reptile species have been recorded. An on-going fauna survey is being carried out in the park which is likely to increase the numbers of species recorded, and may result in the development of specific species management strategies.

Mammal species currently recorded include the swamp wallaby *Wallabia bicolor*, short beaked echidna *Tachyglossus aculeatus*, brown antechinus *Antechinus stuartii*, eastern pygmy-possum *Cercartetus nanus*, southern brown bandicoot *Isoodon obesulus*, northern brown bandicoot *Isoodon macrourus*, tiger quoll *Dasyurus maculatus*, grey headed flying fox *Pteropus poliocephalus*, sugar glider *Petaurus breviceps*, common bent wing bat *Miniopterus schreibersii* and water rat *Hydromys chrysogaster*. The southern brown bandicoot is listed as endangered and the tiger quoll and common bent wing bat are listed as vulnerable under the Threatened Species Conservation Act.

Sightings of platypus *Ornithorhynchus anatinus* and koala *Phascolarctos cinereus* have been reported. Platypus may occur in Middle Creek and in Deep Creek above the confluence with runoff from the Belrose Waste Management Centre. They may be threatened by water pollution.

Of the bird species recorded, about 40 are water birds, concentrated along the main creeks and small patches of wetland. These include several species of cormorants, ibis, terns, egrets, herons, ducks and other species such as the dusky moorhen *Gallinula tenebrosa*, chestnut teal *Anas castanea* and purple swamphen *Porphyrio porphyrio*.

A large number of bird species utilise the extensive areas of forest, woodland and heath, including twelve species of honeyeater, the yellow thornbill *Acanthiza nana*, glossy black cockatoo *Calyptorhynchus lathami*, crimson rosella *Platycercus elegans*, fan-tailed cuckoo *Cacomantis flabelliformis*, tawny frogmouth *Podargus strigoides*, black-faced cuckoo-shrike *Coracina novaehollandiae*, golden whistler *Pachycephala pectoralis*, spotted pardalote *Pardalotus punctatus* and the vulnerable powerful owl *Ninox strenua*. Birds inhabiting the small areas of closed forest and tall open forest include the topknot pigeon *Lopholaimus antarcticus*, Lewins honeyeater *Meliphaga lewinii* and brown pigeon *Macropygia amboinensis*.

Raptors recorded in the park include the wedge-tailed eagle *Aquila audax*, crested hawk *Aviceda subcristata*, white-breasted sea eagle *Haliaeetus leucogaster*, black shouldered kite *Elanus notatus* and the vulnerable osprey *Pandion haliaetus*.

Reptile species recorded include the endangered broad-headed snake *Hoplocephalus bungaroides*, the diamond python *Morelia spilota spilota*, red-bellied black snake *Pseudechis porphyriacus*, yellow-faced whip snake *Demansia psammophis*, green tree snake *Dendrelaphis punctulatus*, eastern water dragon *Physignathus lesueurii*, wall lizard *Cryptoblepharus virgatus*, copper-tailed skink *Ctenotus taeniolatus* and White's skink *Egernia whitii*.

Many species which formerly occurred are no longer present in the park because of habitat destruction, the small size of the remaining bushland and predation by introduced animals. Mona Vale Road, Warringah Road and Wakehurst Parkway are major barriers to the movement of many species, isolating the park from adjacent bushland and restricting movement between parts of the park.

The Service is conducting an on-going fauna survey of the park. Research is needed into habitat requirements of native animals recorded in the park, and particularly into threatened species, but the main requirement is for maintenance of habitat by appropriate fire management and water quality control.

A number of introduced species commonly occur in the park, owing largely to the proximity to urban development. Of these, feral and domestic cats, foxes and dogs present the greatest threat to the limited populations of native animals.

Policies

- * The park will be managed to conserve its value as habitat for native animals.
- * The habitats of threatened animal species will be identified and protected.
- * Research will be encouraged into habitat requirements, status and distribution of native animals in the park, particularly threatened species.
- * Introduced animals will be controlled where they threaten the conservation of native plants and animals or where they are causing problems for adjoining landowners and authorities.

Actions

- * A report will be prepared containing the results of park fauna surveys. The report will be updated as necessary.
- * A feral animal control plan will be prepared and implemented. Feral cat and fox control will be carried out on an ongoing basis consistent with the feral animal control plan.
- * Symbol signs indicating dogs are not permitted will be placed at all park entry points.

4.1.4 Fire

Management of bushfire in the park is an important and complex issue. It must aim to achieve both long term conservation of natural communities and ongoing protection of life and property within and adjacent to the park.

Bushfires are a natural feature of the environment of the park and are essential to the conservation of some plant and animal communities. The occurrence of fire has however been altered by the presence of urban development since the early to mid-1900s. As a result, the structural diversity and species composition of both flora and fauna are also likely to have been altered.

Frequent intense bushfires can result in extensive soil erosion, loss of plant and animal species diversity, simplification of structural diversity and weed and exotic animal invasion.

Infrequent fires can also lead to reductions in species diversity, inability to control wildfires and subsequent damage to life and property.

From research a fire frequency of 12 to 20 years appears to be appropriate for maintenance of most vegetation associations in the park. Shrubland generally requires more frequent fire than forest in order to maintain its structure and species composition. Wet forest, however, should not be burnt. Research is currently underway on the fire ecology of the threatened plant species within the park.

Common sources of wildfire within the park include lightning strikes, illegally lit camp fires, burning of dumped cars and arson.

The park is included within the areas of the Warringah/Pittwater and Hornsby/Kuring-gai District Fire Protection Committees and is covered by Section 41AB (Bush Fires Act, 1949) Plans which detail co-operative arrangements for fire suppression and fuel management within the area. Fire management strategies for the park are briefly covered in the Service's District Fire Management Plan and will be covered in more detail in the Garigal National Park Fire Management Plan.

Fire activities are undertaken with the assistance of local Volunteer Bushfire Brigades. The Brigades and Service have a good working relationship and this will be actively fostered for mutual benefit.

The Service has adopted a strategy of reducing fire hazard by prescribed burning and maintenance of a network of management tracks. For effective protection of private property adjacent to the park it is essential for co-operative fire protection arrangements to be in place between landholders and the Service.

The objectives for bushfire management within the park are:

- to reduce the risk of bushfire damage to life and property both within the park and in areas adjacent to the park;

- to effectively manage bushfires for the protection and conservation of the natural, cultural, scenic and recreational features of the park; and
- to promote effective and efficient utilisation of local bushfire fighting resources through co-operative planning arrangements.

Policies

Fire prevention

- * Fires may be lit by the public only in authorised fireplaces or portable barbecues in the Davidson Picnic Area and Bantry Bay picnic area.
- * Park fire bans and closures will be imposed when weather conditions and fuel loads are such as to present fire control problems and a total fire ban has not been imposed.
- * The Service will seek to improve the level of community understanding of the role and management of fire within the park and the importance of fire prevention measures outside of Service areas.
- * Where appropriate the Service will seek to involve neighbours in cooperative hazard reduction works for mutual protection.
- * Community Fireguard groups will be encouraged.
- * The Service will contribute to appropriate environmental planning and assessment processes, particularly regarding developments proposed close to the park. The Service will encourage the incorporation of fire protection measures in design of development adjacent to the park.

Prescribed burning

- * Prescribed burning may be undertaken to:
 - reduce the risk of high intensity fire close to any property or major visitor area, consistent with the criteria for determining fire hazard and associated fuel reduction zones;
 - protect areas where there are fire sensitive soils, communities, habitats or species (for example: koalas, *Grevillea caleyi*, rainforest, vegetation more than 30 years old, etc.);
 - assist in the control of wildfires at strategic locations;
 - provide, maintain or protect the diversity of age classes in the following vegetation types;
 - open forest (*E. piperata* - *A. costata* assoc.);
 - low open forest (*E. racemosa* - *E. gummifera* assoc.);
 - woodland; and
 - closed scrub and scrub heath;

- promote or protect threatened plant or animal species;
 - ensure the long-term survival of all species indigenous to the park; and
 - for approved experimental purposes where the results can be demonstrated to be directly useful to park management.
- * Prescribed burning will be undertaken in accordance with fuel management plans. It will be undertaken where it is the most practical and efficient means to reduce bushfire hazard. Where prescribed burning is not considered to be appropriate, manual or mechanised methods of hazard reduction will be implemented if needed.
 - * Prescribed burning will be of moderate to high intensity wherever possible.
 - * As far as possible, prescribed burning will not be undertaken in areas identified below for minimisation of bushfire frequency.

Fire frequency

- * The average period between fires for any area will as far as possible not be less than 12 years unless otherwise required by a species recovery plan for the conservation of a species or community.
- * At least 50% of each vegetation type in the park will be maintained in as old an age class condition as possible.
- * As far as possible the frequency of fire will be minimised within the following areas:
 - closed forest, low closed forest and open forest *E. pilularis* assoc., *E. capitellata* assoc. and *E. paniculata* assoc;
 - known locations of *Grevillea caleyi*, *Haloragodendron lucassii* and other significant species which are fire sensitive or their fire ecology is not known;
 - where slopes exceed 18 degrees; and
 - vegetation occurring on rock gnammas.

Fire suppression

- * The control of wildfires within the park will be given priority over all other activities and the protection of life and property will have the highest priority.
- * All wildfires will be contained as soon as possible.
- * The use of heavy machinery for fire suppression will be avoided where possible in the vicinity of threatened plants, Aboriginal sites and historic places and in heath and sedgeland.

- * Temporary wildfire control lines and areas disturbed by fire suppression operations will be rehabilitated as soon as practical after the fire.
- * Management tracks will be categorised and a minimum maintenance standard developed for each of these categories.
- * Close contacts will be maintained with volunteer bushfire brigades, local councils, the Board of Fire Commissioners, local police units and the NSW Ambulance Service. The Service will continue to actively participate in local Bush Fire Management Committees and District Fire Committees.

Research

- * The Service will undertake, support and encourage research into:
 - the effects of fire regimes on communities and species, particularly those which are threatened;
 - the effects of fire regimes on weed establishment and control;
 - fire behaviour in Hawkesbury sandstone vegetation types; and
 - bushfire hazard assessment and mapping.

Actions

- * A fire management plan will be prepared for the park in accordance with the objectives and policies outlined above.
- * An education programme will be developed in co-operation with other appropriate authorities to inform the community of fire management issues in Garigal National Park and to encourage responsible and co-operative fire protection works.

4.1.5 Landscape

The landscape of Garigal National Park consists primarily of naturally vegetated, deeply dissected sandstone valleys with rocky spurs and ridges. These characteristics make it possible to experience a sense of remoteness within close proximity to urban development. Features such as rock platforms, waterfalls, caves, wildflowers and sandy beaches add greatly to the natural landscape value of the park.

From within the northern part of the park many of the views are of uninterrupted wooded skylines. Unfortunately many of the ridgetop areas and prominent knolls which give this valuable character to Garigal National Park are not within the park but are mostly on vacant Crown Land. Many of the skyline ridges are threatened by development which would result in substantial loss of the landscape value and natural recreation value of the park.

In contrast to the rugged valleys and ridges of the northern sections, the southern part of the park focuses on the upper reaches of Middle Harbour. The visual quality of Bantry Bay is exceptionally high and derives from the combination of narrow waterway and steep foreshores with dense bush extending right to the waterline. This is coupled with an atmosphere of relative tranquillity and silence, in an area only 8 kilometres from the centre of Sydney. The explosives magazines are attractive and architecturally unified, contributing to the scenic quality of the bay. Maintenance of the forest cover on the ridges around Bantry Bay is essential to protection of its landscape character. The naturally vegetated Yeoland Point area (administered by Willoughby Council) is also important to the visual integrity of Bantry Bay.

Policies

- * The high landscape value of the park will be protected.
- * Recreation and management facilities will be located, designed and landscaped to minimise their visual impact. A common design theme appropriate to the area's landscape will be used.
- * Liaison will be maintained with local councils and other relevant land use authorities to ensure the protection of the natural visual quality of the waterways of upper Middle Harbour and naturally vegetated ridges and other scenically significant areas visible from within the park, and to minimise the impact of nearby developments on the landscape and natural values of the park.

4.2 CULTURAL HERITAGE

Places modified by Aboriginal and non-Aboriginal activities are considered part of the cultural heritage of the state. Such places can have aesthetic, historical, social, scientific, architectural or Aboriginal significance.

4.2.1 Aboriginal Sites

The park and its surrounds was part of the territory of the Kuring-gai people, who occupied the coast from the north side of Sydney Harbour to Broken Bay. Clans or band groups occupied more discrete areas. It appears likely that occupation of the district around the park was centred on Narrabeen Lakes and the adjacent coastline and that the area of the park was used for occasional hunting and foraging trips and seasonal movement through to the Cowan Creek area (Gunn, 1992).

There is considerable evidence of past Aboriginal activity in the area. Nearly 100 Aboriginal sites have been recorded within the park including shelters, cave art, rock engravings, middens, grinding grooves and a possible stone arrangement. The largest number are engraving sites located on the ridge tops or upper slopes. Other sites are known but have not yet been formally recorded and registered. Many of

the engraving sites are weathering and should be recorded in detail before they deteriorate further.

A major rock engraving site above Bantry Bay has had many of its figures vandalised or otherwise eroded. A conservation plan is being prepared for the site detailing protection and interpretation works and a new bike riding route is proposed that avoids the rock platform (refer to Section 4.3.2).

A systematic archaeological survey has not been carried out for the whole park and it is highly likely that many more sites exist than have been recorded.

Public visitation to Aboriginal sites within the park has not been actively promoted. A number of sites, however, are widely known to the public and some require protective management.

Garigal National Park falls within the Metropolitan Local Aboriginal Land Council area. The Council is consulted about matters which are likely to be of concern to the Aboriginal community.

Policies

- * Aboriginal sites within Garigal National Park will be conserved.
- * The Service will liaise with the Metropolitan Local Aboriginal Land Council about site management and interpretation of the Aboriginal history of the park.
- * The condition of Aboriginal sites which receive high levels of visitation will be monitored and protective measures will be undertaken if it is found that damage is occurring.
- * Sites threatened by natural causes will be protected if possible or identified as priority sites for detailed recording and research.
- * All development work proposed for the park will be preceded by an inspection for Aboriginal sites and modified to avoid impact. All maintenance work will have regard for potential impact on sites.
- * The location of Aboriginal sites will not be publicised and recreation facilities, including walking tracks, will not be located close to Aboriginal sites except where:
 - consultation with the Metropolitan Local Aboriginal Land Council has occurred and they are in agreement;
 - 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 of Aboriginal culture.

- * Where groupings of sites impart a special significance to an area a conservation plan will be prepared detailing necessary protection actions.
- * Understanding and appreciation of Aboriginal culture and occupation of the park will be promoted.
- * Non-destructive research into past Aboriginal use of the area and the characteristics and distribution of Aboriginal sites will be encouraged.

Actions

- * A conservation plan will be prepared for the Bantry Bay rock engraving site and other Aboriginal sites in the vicinity of the proposed mountain bike track. The sites will be protected and interpreted in accordance with the conservation plan.
- * Protective measures will be undertaken for other Aboriginal sites where necessary.
- * Aboriginal sites that are known of but not yet recorded will be formally recorded and registered.

4.2.2 Historic Places

The non-Aboriginal history of the Garigal National Park area dates from within three months of the first settlement at Sydney Cove. In April 1788, Governor Phillip accompanied by John White, Surgeon General to the settlement, camped two nights within what is now the park while exploring the land west of Manly. His campsite was at Bungaroo, at the tidal limit of Middle Harbour Creek. A Bicentennial project was undertaken in 1988 in association with Ku-ring-gai Municipal Council to establish what is now known as the Bungaroo Track. It attempts to follow, in accordance with the description in Surgeon White's Journal, Phillip's westward course up from the tidal limit of Middle Harbour Creek into the Ku-ring-gai Hills.

The Narrabeen area, east of the park, was first settled by Europeans around 1818. Clearing continued through the early 1800s and the area was used for market gardening, sheep grazing and timber harvesting.

The plateau areas were settled later. The earliest recorded land owner in the Bantry Bay area was John Spencer on the western slopes above the bay in 1842. In 1853 Simeon and James Pearce purchased 200 acres in the forest north of Bantry Bay. Simeon arranged construction of a road to the bay and a wharf. James French acquired land north of Bantry Bay in 1856 and established sawmills. Logs were hauled along the road and down to the wharf at Bantry Bay by bullocks. The bullock track at Bantry Bay is still in use by walkers. A conservation plan will be prepared detailing work necessary to prevent erosion and conserve stone masonry on the track.

Middle Harbour was a popular picnic area from the 1800s. The New Balmain Ferry company began cruises to Bantry Bay and Flat Rock in 1906 and constructed terraced picnic grounds, a dance hall, cottages and jetty on the eastern side of the bay. Most of these were removed when the explosives complex was constructed.

A site for an explosives magazine complex was surveyed in Bantry Bay in 1907 following concern about the danger presented by the various explosive storages in Sydney and an inquiry into storage requirements. Construction was completed in 1915. The complex operated safely until it was closed in 1974 because of changes in technology and handling of explosives, and the increasing cost of the operation.

The site comprises thirteen magazines and some other buildings, nine of which were used to store dangerous explosives (see Map 2). These magazines were recessed, designed and constructed to satisfy very specific safety and design criteria to minimise the likelihood of explosion and amount of damage which would be caused in that event. They have thick walls and floors which maintain even internal temperatures, light roofs and other appropriate materials. They are a good example of the public utility architecture of Federation Sydney, much of which has been lost. The remains of a slipway and an explosives testing station are located on the eastern side of Bantry Bay.

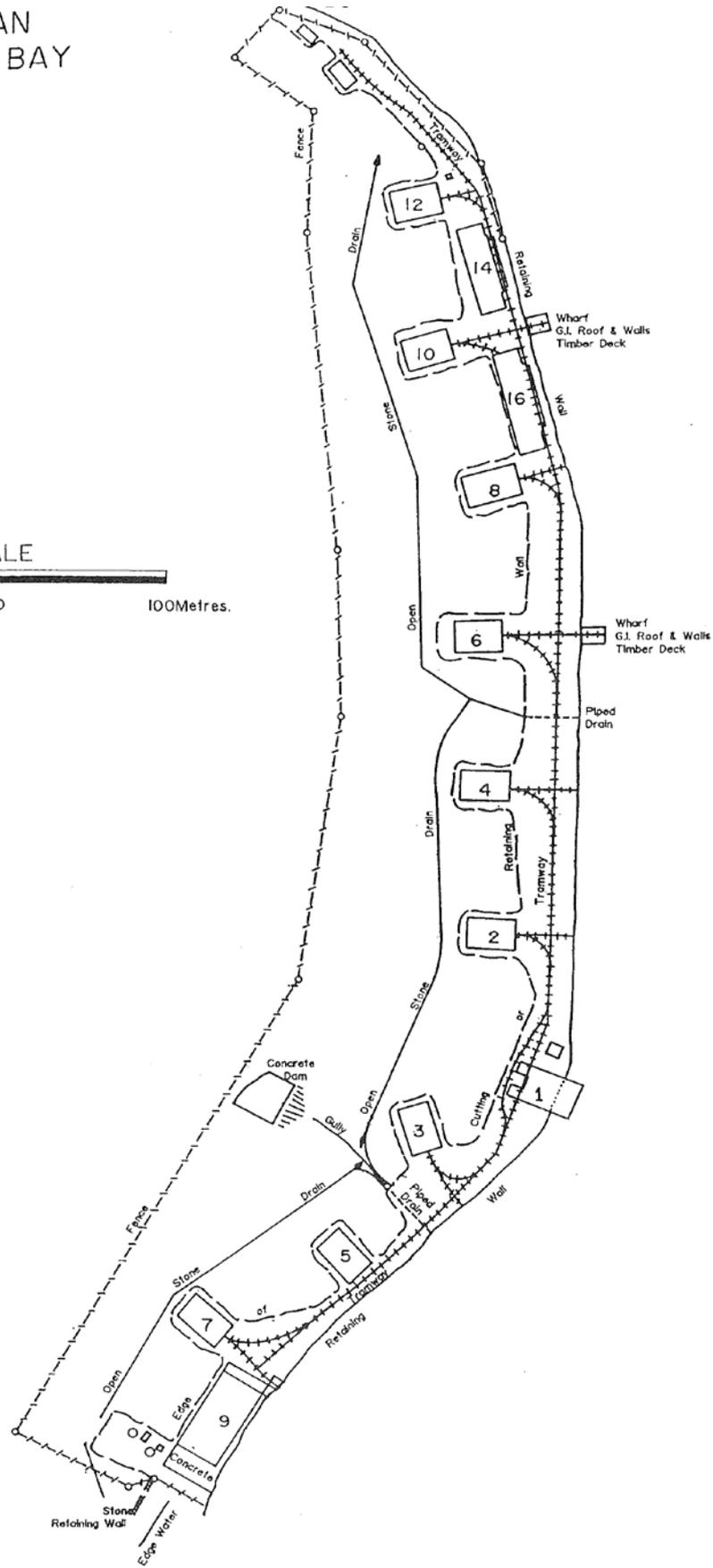
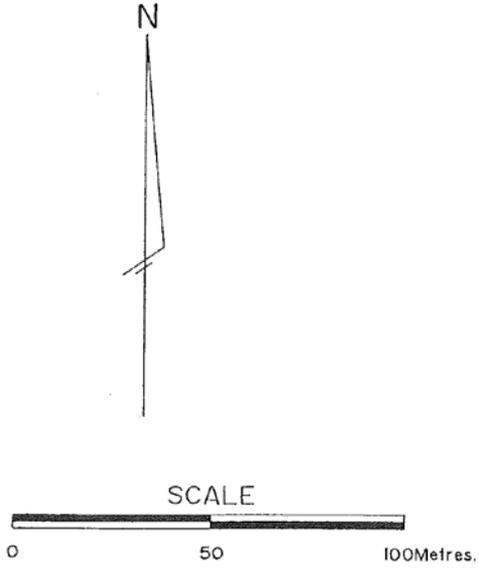
Following the transfer of Bantry Bay to the Service a major stabilisation programme was undertaken on the western seawall but there were insufficient funds to complete the work. Most of the buildings are in reasonably sound condition but have been subject to vandalism and most of the fittings have been removed. The receiving magazine building (No. 1) is threatened by collapse of its seaward foundations. Large cracks in the brickwork indicate that settling has occurred and the reinforced concrete floor and beam structure is suffering badly from reinforcing corrosion.

A conservation plan prepared by the Service in 1991 (Conyers & Le Maistre) describes the history, design and construction of the magazine complex and sets out in general terms the works needed for conservation and the policies under which this should be undertaken. The conservation plan recommends the preservation of a sample of buildings and the remaining wharves to demonstrate the functioning of the site. It identifies the receiving magazine as the most significant structure on the site but acknowledges that it may not be possible to repair without removal of the roof and walls. In this case it will not be reconstructed but demolished and removed to prevent its collapse into the bay. Buildings 9, 14 and 16 may also be demolished if necessary.

The conservation plan also allows for the re-use and adaptation of some buildings on the site to provide for appropriate new use of the site. The design of the buildings is such that they can not be adapted for a wide variety of uses without their significance being compromised. Access difficulties and the current lack of utilities may also cause problems for anyone interested in re-using the site. The Cascades area of Middle Harbour Creek, with its natural swimming pools, has long been a haven for bushwalkers and local residents. In 1928 during the Great Depression Kuring-gai Council constructed rock walls to enhance the pools. These were later broken down because of pollution of the dammed water. Stone seats along an old walking track near Lockley Point were also constructed during the Great Depression.

Map 2 Sketch Plan of Bantry Bay

SKETCH PLAN OF BANTRY BAY



The Cascades was a focal point for scouting activity and during the 1950s regular district camps were held there. Camping caused vegetation destruction and soil erosion and as a result is now prohibited.

The park has been the site of various public utility works. The principal one is the Bantry Bay Explosives Magazine but it also contains an aqueduct built before 1937, transmission lines and sewerage mains. Quarrying has been carried out at several locations, principally in the large quarry area on a ridge north of Middle Creek.

An Australian Broadcasting Commission film site was located adjacent to Five Mile Creek between the late 1960s and the late 1980s. A replica colonial town was constructed on the site and used for productions such as "Ben Hall", "Rush", "Five Mile Creek" and parts of "Captain Cook". Most of the structures were recorded and removed.

Policies

- * The historic places of Garigal National Park will be conserved in accordance with the principles established in the Burra Charter.
- * Subject to safety and security requirements the Bantry Bay explosives magazine complex will be opened to controlled public visitation.
- * The magazine buildings may be adapted for educational, commercial or other uses subject to the conservation plan and the following:
 - the quiet, secluded character of the Bantry Bay area will be retained;
 - no vehicle access will be constructed; and
 - public visitation to the site is not prevented.
- * Any change in the management and use of the Bantry Bay complex will be placed on public exhibition.
- * All work involving ground disturbance within the park will be preceded by a check for historic places or will be monitored by an archaeologist if there is a likelihood of sub-surface material.
- * Research into the history of the area will be encouraged.

Actions

- * The Bantry Bay sea wall stabilisation programme will be continued.
- * An engineering investigation will be undertaken of the receiving magazine to determine works necessary to stabilise the structure. If the magazine cannot be stabilised without demolition of the roof and walls, the building will be removed unless a lessee decides to reconstruct it to ensure viability of the site.

- * One or more of the original explosives magazines will be restored and interpreted.
- * Expressions of interest will be sought for adaptive use of the Bantry Bay explosives magazines in conjunction with conservation work. Leasing arrangements may include provision for management of the picnic area on the eastern side of Bantry Bay. If the Service proposes to proceed with any re-use of Bantry Bay, the proposal will be made available for public comment.
- * Sponsorship support will be sought for conservation work on the explosives magazines if a lessee is not obtained.
- * Erosion control and masonry conservation work will be undertaken on the old bullock track in accordance with the conservation plan for the track.

4.3 USE OF THE AREA

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

- education and promotion of the area, the Service and the conservation of natural and cultural heritage;
- recreation in a natural setting;
- scientific 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 Garigal National Park is indicated in the following sections of the plan.

4.3.1 Promotion and Interpretation

Provision of information about the park's natural and cultural heritage, recreation opportunities and management policies is an important part of management. Its purpose is to attract visitors to appropriate areas, enhance their enjoyment, encourage non-damaging visitor behaviour, foster environmental awareness and gain the support and co-operation of neighbours and the community.

As outlined in section 2.2.2 the park is close to the centre of Sydney and has significant and varied recreational and educational values which are different to those in other Sydney reserves. It is presently primarily a local recreational and educational resource and will continue to be promoted on that basis.

Interpretive information on the park will be provided at the Roseville Bridge boat ramp, Davidson Picnic Area, and at major track entry points. The latter is covered in section 4.3.2. A short interpreted nature walk will also be provided near the Davidson Picnic Area.

Volunteers working with the Chase Alive Programme conduct walks, talks, spotlighting and similar activities in the park.

The walking track system in the park links with nearby reserves managed by local councils. Provision of information on district walking opportunities should be undertaken on a co-operative basis to make the system available to a wide range of people.

Policies

- * The park will be promoted as an important conservation area close to the centre of Sydney.
- * Promotion will concentrate on appreciation of natural and cultural values of the park, picnicking, walking, recreational boating and educational opportunities which are accessible from the Davidson Picnic Area and Roseville Bridge boat ramp area.
- * Information will be provided on the recreational and educational opportunities of the park by such means as displays, signposting and leaflets.
- * The following themes will be emphasised in promoting and interpreting the park:
 - the attractive natural landscape and opportunities to relax and escape from the city;
 - the variety of plant communities and significant species and communities;
 - the refuge value of the park for native plants and animals, including the importance of sympathetic management of adjacent land;
 - the variety and significance of Aboriginal sites and Aboriginal use and occupation of the area; and
 - the European history of the area and interesting historic places, in particular Bungaroo and Bantry Bay, including their value as remnants of landscapes similar to those experienced by early explorers.
- * Interpretive programmes will include information and activities for disabled and ethnic groups.
- * Information will be designed to assist management to protect the natural and cultural resources of the park. In particular, emphasis will be placed on:
 - encouragement of responsible recreational use; and
 - increasing awareness of the complexities of fire management and the need for a responsible attitude towards fire in the community.

- * The Service will maintain liaison with local government authorities to ensure co-ordinated maintenance, signposting and promotion of linked walking tracks.

Actions

- * A visitor information display will be provided near the Roseville Bridge boat ramps and in the Davidson Picnic Area. Information will be provided on features of interest and walking and boating opportunities.
- * A small interpretive display covering the explosives magazine site will be erected in the picnic area on the eastern side of Bantry Bay.
- * An interpretation programme will be developed and implemented for visitors to the western side of Bantry Bay which will include at least one of the original explosive magazines and the trolley transport system.
- * A sign will be erected at the entrance to the Bantry Bay bullock track explaining its historical significance.
- * Signs identifying Garigal National Park will be erected on boundaries with major roads.
- * A short interpreted nature walk will be developed along that part of the existing Casuarina Track closest to the Davidson Picnic Area.

4.3.2 Recreation Opportunities

Most recreational use of the park is within the Middle Harbour catchment. It comprises mainly picnicking and boating in the Roseville Bridge area and at Bantry Bay, and walking throughout the area on formed tracks. Annual visitation is currently estimated to be about 200,000 of which 60,000 use the Roseville Bridge area. Bike riding is an increasingly popular activity in the park.

Vehicle access to the park is via a large number of arterial and residential roads.

The Roseville Bridge area is the major developed area in the park and includes the extensive Davidson Picnic Area, boat ramps, a kiosk, swimming enclosure and associated parking. One section of the picnic area is available for booking by large groups. Although firewood is provided, the collection of additional firewood for barbecues is having an impact on the surrounding bush. There is a gradual decrease in the degree of development and urban quality of the setting from the boat ramps northwards. Increased planting of clumps of shade trees at the northern end of the picnic area would make it attractive to more people, particularly on hot days. Undeveloped clearings with walk-in access in the Forestville Bends area provide for those who want a more natural setting.

The shoreline in the Roseville Bridge area is edged by a rock sea wall. This protects the shore from erosion but prevents use of the shoreline by picnickers. It would be

desirable for as much as possible of the unwallied shoreline north of the swimming enclosure to be retained to protect the more natural setting in this area, allow access for canoes and small boats and diversify the recreational opportunities of the park.

A building which included a restaurant was constructed near the Roseville Bridge boat ramps during 1992 by a private operator in accordance with a lease from the Service, but it has never been completed or opened. The Land and Environment Court ruled that an environmental impact assessment should have been prepared for the building and the building should not be used for an exclusive use. The determination of the environmental impact statements for the building by the Department of Urban Affairs and Planning required that if the building was to remain it should be used as a kiosk and/or visitor centre and/or office and the roof of the building should be substantially modified.

The Service has considered these options but its preferred position is that the building should be pulled down leaving only a toilet block and sheltered interpretive display. These proposals will require an environmental impact assessment.

A small picnic area with walk-in access is provided on the eastern bank of Bantry Bay. Bantry Bay is one of the most unspoilt areas of bushland in the metropolitan area and is a unique setting for picnicking and boating. It is a popular day and overnight boat mooring area. Because of the lack of road access, management of the picnic area is difficult. If adaptive use of the explosives magazine is arranged as discussed in section 4.2.2, it would be efficient for a concessionaire to manage the Bantry Bay picnic area.

Tracks cover all parts of the park allowing a considerable variety of walks. Most are moderately long and in places steep or rough. The large number of tracks creates a heavy maintenance burden and contributes to weed invasion and soil erosion. Some tracks are duplicated or are little used. A major rationalisation programme is being undertaken for the track system with closure of unnecessary tracks and maintenance of well used tracks which are in poor condition.

Tidying and signposting of many of the track entrances is required. Provision of parking is also needed at some track heads.

A link is needed between the Cook Street Track and Bay Track to permit walking around Bantry Bay and along the full length of the Middle Harbour section of the park.

Links between the Middle Harbour section of the park and walking tracks in reserves managed by Ku-ring-gai Municipal Council, Manly Dam Reserve and along the Harbour foreshore, provide opportunities for extended walks. Provision of links to the Narrabeen Lakes section of Garigal and to Ku-ring-gai Chase National Park would greatly increase walking opportunities as would links to the Great North Walk. Existing tracks will be used except where an adopted review of environmental factors recommends otherwise.

Horse riding is a popular recreational activity in New South Wales and there is some interest for this activity occurring in national parks. Horse riding has been legitimately undertaken on specified trails in Garigal National Park for many years.

In the 1960s and 1980s, studies were undertaken of the impacts of horse riding in Ku-ring-gai Chase National Park and controls were introduced to manage horse riding activities in both Ku-ring-gai Chase National Park and Garigal National Park. The last review, which was undertaken in 1986, resulted in the introduction of a horse riding management system for Ku-ring-gai Chase and Garigal National Parks under which horse riders in these parks were required to have an annual riding permit or a day-use riding ticket. The revised system allowed for horse riding on 21 kilometres of trails in these two parks. It also resulted in the closure of some trails to horse riding and the rehabilitation of unauthorised paths in certain sensitive areas. The permit system has since been discontinued.

Horse riding is currently permitted on the following tracks:

- a. Heath Track;
- b. Cascades Track;
- c. Bare Creek Track between the Heath and Cascades Tracks; and
- d. Lower Cambourne Track.

In 2012, the Office of Environment and Heritage (OEH) endorsed a new horse riding strategy entitled 'Strategic directions for horse riding in NSW national parks' (OEH 2012). The strategy was developed to guide the provision of improved horse riding opportunities in New South Wales national parks, and in particular, in eight priority regions including Metropolitan North East Region (the Region). The Metropolitan North East Regional Horse Riding Consultative Group, made up of local horse riding representatives, was formed to identify and prioritise new horse riding opportunities within the Region and to identify specific proposals for consideration for inclusion in a work plan.

The horse riders identified safe riding connectivity from suburbs to trails and to horse riding facilities, connectivity between trails and longer riding experiences as key issues.

Within Garigal National Park, the work plan identifies five existing trails or tracks to be investigated for their potential to be opened to horse riding, pending as required, environmental assessment, cross-tenure negotiations and funding availability, as follows:

- e. Kitchener Trail
- f. Tree Loppers Trail (between Kitchener and Quarry trails)
- g. Quarry Trail
- h. Slippery Dip Trail
- i. Five Mile Creek Trail.

While trail and track erosion has been a significant issue for NPWS, methods of trail construction, management and maintenance have changed in the past decades to remove water directly from trails, using high cross-banks and outlay drainage. Current trail maintenance regimes for trails with low gradients are likely to be able to withstand the addition of low to moderate frequency horse riding.

Due to opposition from neighbouring landholders, Slippery Dip Trail and Five Mile Creek Trail are not considered viable options in the short or medium term. The authorised management tracks for horse riding are shown on Map 3.

A number of private horse owners and riding schools use tracks in the park. Garigal National Park, along with nearby Ku-ring-gai Chase National Park, is important to these local groups for recreational riding. Horse riding in national parks can, however, be associated with a range of potential impacts with associated high rehabilitation costs, including:

- impacts on soil, water and vegetation;
- structural impacts on trails; and
- introduction of foreign material into protected areas.

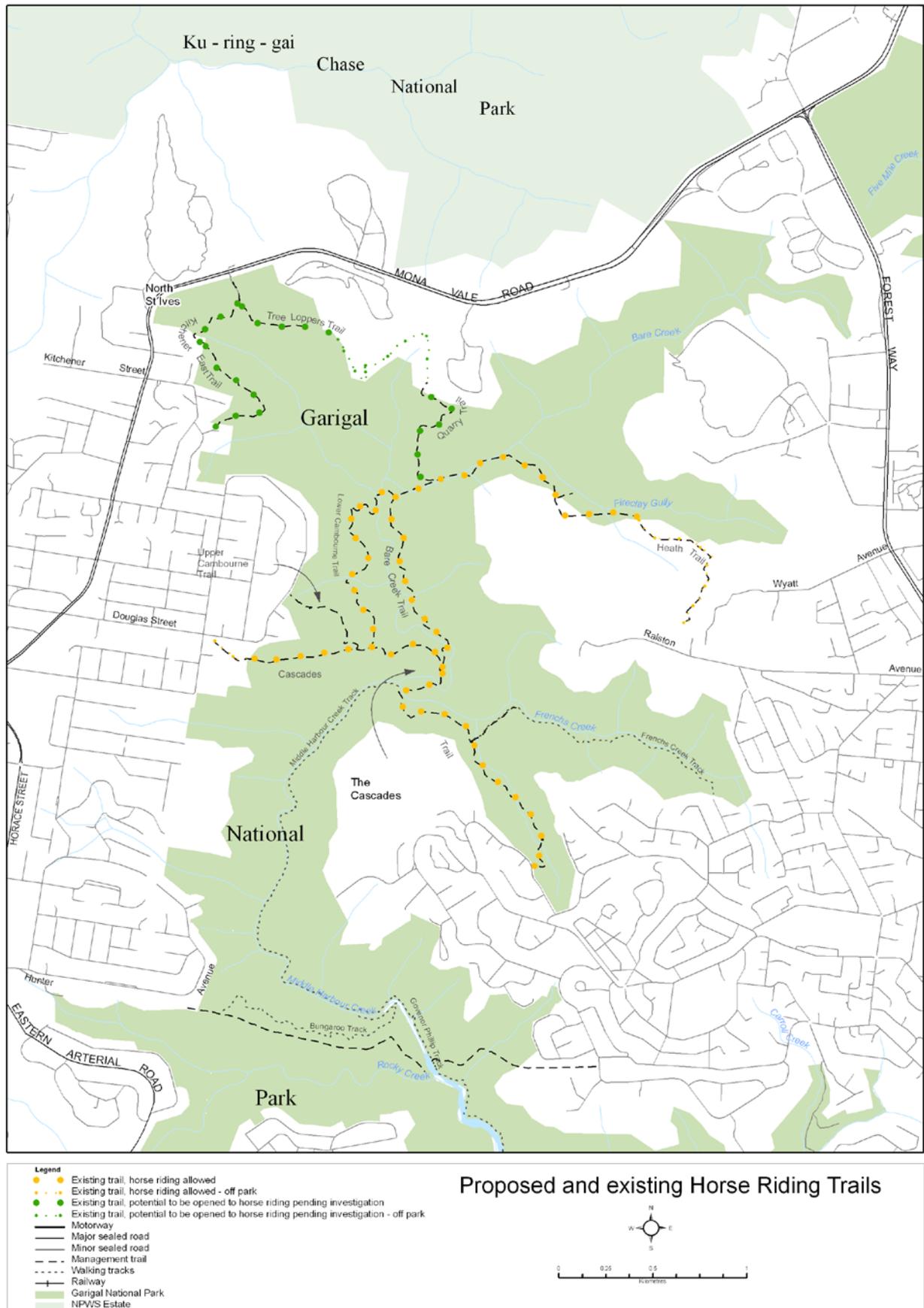
It is essential for horse riding to be limited to appropriate tracks. Rider education is required to ensure park values, potential impacts on these values, and the need for compliance with regulations are understood. Enforcement will be applied if required.

The condition of trails and surrounding areas including waterways will be monitored by appropriately qualified people prior to and during at least the first three years of horse riding with potential for extension of monitoring based on the findings of the first three years. Where negative impacts are occurring, measures to minimise or eliminate such impacts will be put in place and tracks will be closed to horse riders until there is sufficient resourcing available to repair the damage and ensure that ongoing mitigation is possible to avoid further damage.

As seen across Garigal National Park and national parks in northern Sydney generally, the Bantry Bay area of the park is very popular with mountain bike riders and has become more popular as bike riding for leisure has increased amongst Sydneysiders. Bike riding is permitted on authorised management trails within the park but not on walking tracks. Bike riding is also taking place along tracks that have been used or created by riders without authorisation.

Sections of these tracks in the Bantry Bay area are routed through sensitive vegetation communities and across sites of Aboriginal cultural heritage that have strong contemporary connection for Aboriginal communities. Other sections are steep and eroding. Notable is the impact of unauthorised tracks through a section of Coastal Upland Swamp in the Sydney Basin Bioregion, an endangered ecological community under the *Threatened Species Conservation Act 1995*. Despite management efforts to close tracks and dissuade riders from using these track sections through education and enforcement, impacts are ongoing.

Map 3 Horse Riding Trails in the Park



Although bike riding along walking tracks is not permitted in the park, bike riding is occurring along designated walking tracks in the Bantry Bay area, raising safety concerns amongst walkers.

In line with the NPWS Sustainable Mountain Biking Strategy (OEH 2011a) and NPWS Cycling Policy (OEH 2011b) and following assessment of site suitability and demand across all NPWS parks in the northern Sydney area, a purpose-designed mountain bike track is proposed in the Bantry Bay area of the park. The track will be designed to minimise negative environmental, heritage and social impacts and will be subject to environmental assessment and monitoring. It will be aligned and constructed to minimise erosion, divert bike riders away from areas of Aboriginal rock engravings and divert around species and vegetation communities that are of state-level, or higher, significance.

The experience provided will be an authorised, cross-country / all-mountain mountain bike route, approximately seven to ten kilometres in length as shown on Map 4. The track will comprise mostly a 'one-way' route from beginner up to intermediate levels. The route will include attractive landscape features, such as view points. It will allow separation of mountain bike riders from bushwalkers. It will be supported by basic local government visitor infrastructure such as car parking space and toilets and will aim to attract local and regional visitors who may wish to enjoy a few hours exploring the park and surrounds.

NPWS will continue to work with local government and other government agencies to ensure coordination of the overall experience, route planning and linkages, information provision and visitor education.

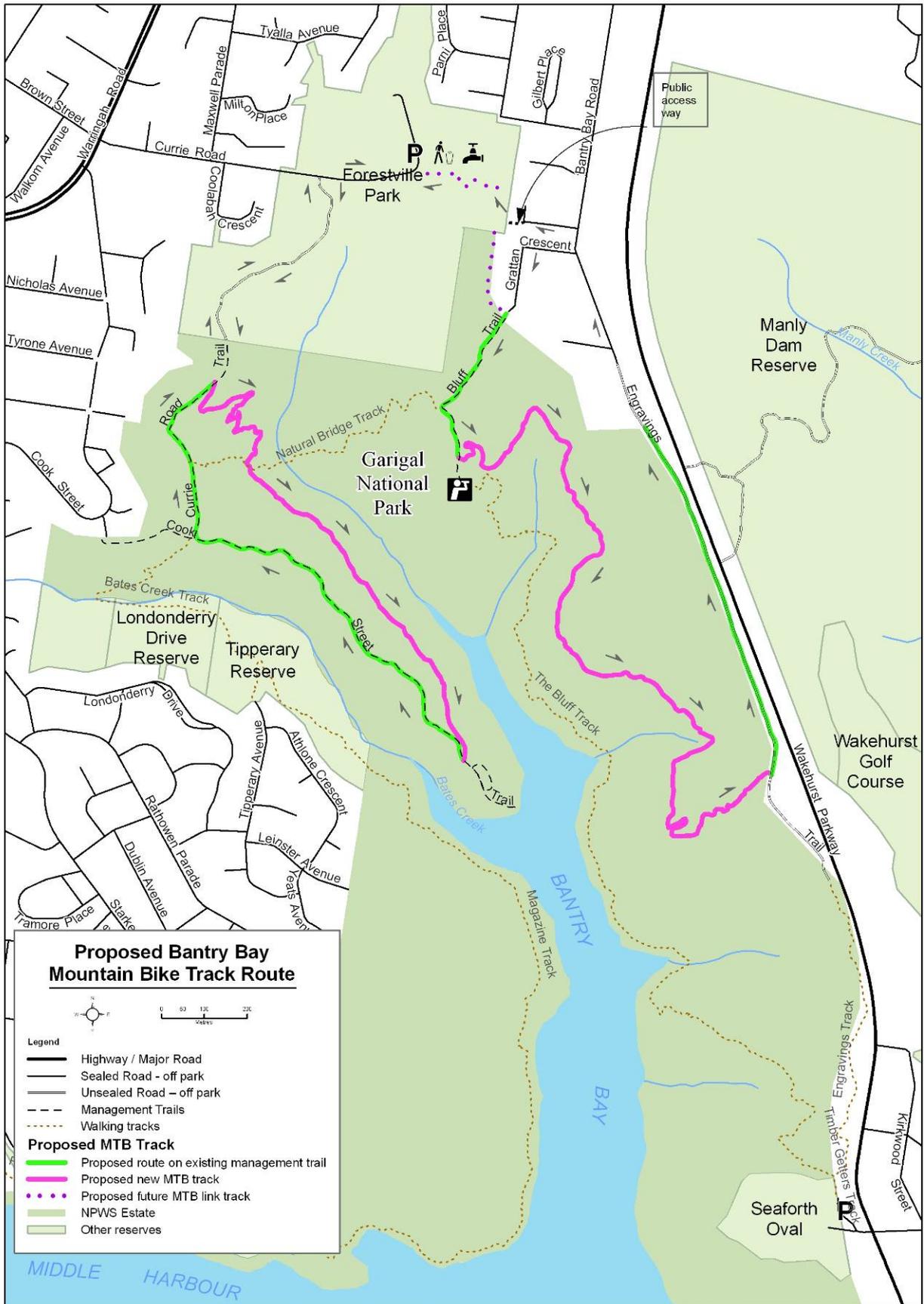
A number of commercial organisations and schools use the park for walking, boating and nature study tours. Such programmes require a licence or consent from the Service. Preference will be given to activities which increase knowledge and appreciation of the natural or cultural values of the park.

Policies

Recreation facilities

- * The Roseville Bridge area will continue to be the location for major day use facilities including picnic areas, toilets, boat ramps and swimming pool. The existing character of a decreasing degree of development from Roseville Bridge northwards will be retained.
- * Beach access for launching of small boats and canoes will be retained at the northern end of the Davidson Picnic Area. The foreshore north of the swimming enclosure to the Forestville Bends will be kept as natural as possible.
- * Open grassy areas will be retained in the Forestville Bends area for small scale picnicking and boating in a bushland setting.

Map 4 Proposed Bantry Bay Mountain Bike Track Route



- * The Bantry Bay area will be managed to provide walk-in picnicking at the existing picnic area, bushwalking, and possibly educational or commercial facilities in the former explosives magazine (see section 4.2.2). Management of the picnic area may be undertaken by a concessionaire in conjunction with leasing of the former explosives magazine.
- * Facilities in the remainder of the park will be limited to tracks and associated signs and car parking.
- * Tracks will be progressively maintained and where necessary upgraded.
- * The Bantry Bay area will incorporate an authorised cross-country / all-mountain bike track, which will form part of a regional mountain bike focal point in the Manly Warringah area.
- * NPWS will work with other authorities to investigate future mountain bike opportunities in the Manly Warringah area.

Use of tracks

- * The walking tracks, shown on the Map 1, will be retained.
- * Walking tracks proposed to be retained will be subject to an assessment of their environmental impact and may be re-aligned or otherwise modified to reduce any unacceptable environmental impact.
- * The walking track system may form part of a walking track link between the Manly area and the Great North Walk. Existing tracks within Garigal National Park will be used except where a publicly exhibited and adopted review of environmental factors recommends otherwise.
- * A system of walking tracks will be developed within the Narrabeen Lagoon catchment area of Garigal National Park.
- * Other informal walking tracks not shown on Map 1, will be closed to use and action taken to encourage revegetation.
- * Walking tracks will be maintained to a standard sufficient to prevent erosion and permit general use.
- * Horse riding will be authorised only on designated trails as indicated on Map 3. Horse riding will continue to be permitted on:
 - a. Heath Track;
 - b. Cascades Track;
 - c. Bare Creek Track between the Heath and Cascades Tracks; and
 - d. Lower Cambourne Track

In addition, the following trails and tracks, identified in the Metropolitan North East Region Horse Riding Work Plan 2013, will be investigated for their potential to be opened to horse riding and progressively opened from 2014 pending environmental assessment, cross-tenure approvals and funding availability:

- e. Kitchener Trail;
- f. Tree Loppers Trail (between Kitchener and Quarry trails); and
- g. Quarry Trail.

- * The impact of recreational use, including horse riding, on management trail and track condition, nature conservation values and the enjoyment of Garigal National Park by other users will be regularly monitored. Management trails and tracks will be closed to recreational use in the following circumstances:
 - where significant erosion or other damage to the natural and cultural heritage of the park occurs;
 - where any safety issues arise;
 - where trail maintenance cannot be completed or carried out; and/or;
 - during and after wet weather and during elevated fire danger periods.

Consultation with user groups prior to such action will be undertaken where practical. Tracks and trails will be re-opened only when repaired and/or ongoing mitigation is possible to avoid further damage. Maintenance of park values and user safety is paramount and will underpin decisions.

- * Partnerships with local horse riding groups and other interested groups and individuals will be pursued to assist with park management activities such as education, reporting on management trail and track condition and weed control.
- * Bicycle riding will be permitted on park roads, authorised management trails and along the purpose-designed, designated mountain bike tracks.

Other activities

- * Walks, nature study and similar activities by school groups, community and commercial organisations will be required to have a licence or consent agreement. Preference will be given to activities which increase knowledge and appreciation of the natural or cultural values of the park.
- * Recreation and other activities which pose a danger to other users, create a significant noise nuisance or other nuisance, or have a major impact on the natural and cultural heritage will not be permitted.

Actions

- * Further clumped shade tree planting will be carried out in the Davidson Picnic Area, particularly in the northern part.
- * Public toilets and an interpretive display will be established near the Roseville Bridge boat ramps. The remainder of the current building near the boat ramps will be removed.
- * A walking track system will be established in the Narrabeen Lakes part of the park. This may include a track head facility at a suitable location.
- * Walking track links between the Middle Harbour and Narrabeen Lakes sections of the park and with Ku-ring-gai Chase National Park will be constructed along Bare Creek.
- * A link will be established between the Cook Street Track and the Bay Track across Main Creek in Bantry Bay.
- * Signs containing destination and distance information will be erected at walking track entrances. Interpretation and use information will be included on signs at major track heads.
- * Where necessary and feasible, provision will be made for car parking at track heads.
- * The wood barbecues at Davidson Picnic Area will be progressively replaced with gas and/or electric barbecues.
- * Close and rehabilitate unauthorised mountain bike tracks in the Bantry Bay area of the national park.
- * Provide an authorised cross-country / all-mountain, mountain bike track route of approximately seven kilometres in length. This will be a mostly 'one-way' route catering for beginner up to intermediate levels, that ensures rider enjoyment whilst protecting sensitive cultural and natural heritage features.
- * In partnership with mountain bike groups and other park users, educate bike riders and monitor usage of the Bantry Bay mountain bike track and other bike usage of the park, to measure visitor satisfaction and ensure ongoing environmental and cultural heritage protection. Adapt the track or undertake other management actions as required to protect the natural and cultural values of the park.
- * Install clear and informative educational and regulatory signage that reinforces the conditions under which mountain bike riding is allowed in the Bantry Bay area of Garigal National Park.
- * Measure visitor satisfaction of all park users in the Bantry Bay area of the park.

- * Work with other authorities to provide a safe link to other tenures from the park's new Bantry Bay mountain bike tracks.

4.3.3 Research

Research into the park's resources, their maintenance requirements and the impacts of park users is essential to the development of appropriate management practices. Important research topics have been included in other relevant sections of this plan.

As well as research undertaken by the Service, a variety of research projects are undertaken in the park by others, mainly by students. Topics include plant and animal surveys and research into animal behaviour, animal diets and threatened plants.

Potential areas for research in Garigal National Park include:

- fauna surveys;
- threatened plant research;
- recovery plans for threatened plants and animals;
- methods to control vertebrate pests in urban areas;
- Aboriginal site surveys;
- visitor use surveys;
- recreational opportunities study;
- neighbour attitude surveys;
- ecological effects of fire;
- fire protection needs;
- vegetation survey in Middle Harbour Ck; and
- wildlife corridors connecting to urban bushland and other conservation areas.

Policies

- * The park will continue to be available for appropriate research.
- * Researchers will be encouraged to design programmes to provide information useful for management purposes.
- * 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 park managers.

Action

- * A list of appropriate research topics and projects which would provide information useful for management of the park will be prepared and updated annually, for suggestion to tertiary students and education institutions.

4.3.4 Management Operations

An office/workshop and residence are located in the park at Forestville. The current location of the office and workshop is difficult for the public to find, too small and has Occupational Health and Safety problems. New locations for an office and workshop are being investigated and, if a suitable site can be found, only a small storage area will be retained at Forestville. The site at Roseville Bridge was assessed as not being suitable for these purposes.

Alteration of the entrance to the Davidson Picnic Area and Roseville Bridge boat ramp area is also proposed in order to reduce the number of entrance stations from two to one.

Maintenance of the large number of management tracks in the park (including several old tracks in the Narrabeen Lakes section of the park) to a satisfactory standard is not possible with the limited available funds. Unnecessary tracks will be closed to vehicle use.

Sydney Water maintain several water and sewer lines in the park, including a pipeline across Middle Harbour. There are also power lines, gas pipelines and a trigonometrical station located in the park. In such a small and significant natural area as Garigal, alien facilities have a high impact on conservation and recreational values. Any further such developments in the park would be highly inappropriate. Arrangements are needed for maintenance of existing facilities in a manner which minimises environmental impact.

The park is significantly affected by the actions of local councils, other land use authorities and neighbours and close liaison is essential for successful and mutually beneficial management.

Policies

- * Management tracks shown on Map 1 will be maintained. Other vehicle tracks will be closed and revegetated unless they are part of the walking track system.
- * Only authorised vehicles will be permitted on management tracks.
- * No additional alien facilities or expansion of existing facilities will be permitted in the park unless for essential park management purposes.
- * Facilities maintained by other authorities will be required to be subject to licences detailing measures to minimise the environmental impact of the facilities and works associated with them.
- * Maintenance activities along the powerline easements will be undertaken in accordance with the Powerline Maintenance in National Parks and Wildlife Lands Agreement with Transgrid.

- * Close liaison will be maintained with local councils, other relevant authorities and neighbours concerning matters of mutual interest.

Actions

- * The entrance to the Davidson Picnic Area/Roseville Bridge boat ramp area will be re-aligned and altered to allow provision of one entrance station rather than the current two.
- * Alternative locations for the sub-district office and workshop will be investigated, and the office and workshop relocated to a suitable site off the park if available.
- * A Memorandum of Understanding will be negotiated with Sydney Water to formalise access to their infrastructure.

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, and strategic planning at corporate, Regional and District levels.

The implementation of this plan will be undertaken within the annual programmes of the Service's North Metropolitan District. Priorities, determined in the context of district and 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.

District programmes are subject to ongoing review, within which, works and other activities carried out at Garigal National Park are evaluated in relation to the objectives laid out in this plan.

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 effect to, and that no operations shall be undertaken in relation to the national park unless they are in accordance with the plan. However, if after adequate investigation, operations not included in the plan are found to be justified, this plan may be amended in accordance with section 76(6) of the Act.

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

Activity	Plan Reference
High Priority	
. Assist in development of catchment management plans	4.1.1
. Prepare and implement weed management plan	4.1.2
. Seek co-operative weed removal with Councils	4.1.2
. Protect <i>Haloragodendron lucasii</i> community	4.1.2
. Prepare and implement feral animal control plan	4.1.3
. Erect symbol signs re no dogs	4.1.3
. Prepare Garigal fire management plan	4.1.4
. Prepare and implement conservation plan for Bantry Bay rock engraving site and other Aboriginal sites in the vicinity of the proposed mountain bike track	4.2.1

High Priority (continued)

- . Undertake protection of other Aboriginal sites 4.2.1
- . Continue stabilisation of Bantry Bay sea walls 4.2.2
- . Investigate works required to stabilise receiving magazine 4.2.2
- . Seek expressions of interest for adaption of Bantry Bay 4.2.2
- . Erect walking track entrance signs 4.3.2
- . Remove building near boat ramps 4.3.2
- . Investigate trails and tracks identified for horse riding on Map 3 and progressively open as appropriate. 4.3.2
- . Monitor tracks and trails and surrounding areas including waterways for impacts of recreational use and mitigate or close as required. 4.3.2
- . Pursue partnerships with horse riding groups and other interested groups and individuals. 4.3.2
- . Close and rehabilitate unauthorised mountain bike tracks in the Bantry Bay area of the national park. 4.3.2
- . Provide an authorised cross-country / all-mountain, mountain bike track route of approximately seven kilometres in length. This will be a mostly 'one-way' route catering for beginner up to intermediate levels 4.3.2
- . Monitor usage of the Bantry Bay mountain bike track and other bike usage of the park and educate bike riders, in partnership with mountain biking groups and other park users, and adapt the track, or management approaches, where required . 4.3.2
- . Measure visitor satisfaction of all park users in the Bantry Bay area of the park. 4.3.2
- . Install clear and informative educational and regulatory signage that reinforces the conditions under which mountain bike riding is allowed in the Bantry Bay area. 4.3.2
- . Work with other authorities to provide a safe link to other tenures from the park's new Bantry Bay mountain bike tracks. 4.3.2
- . Alter Davidson Picnic Area entrance arrangement 4.3.4
- . Investigate sites for office and workshop 4.3.4

Medium Priority

- . Prepare local recovery plans for threatened plants 4.1.2
- . Prepare fauna survey report 4.1.3

- . Record known Aboriginal sites 4.2.1
- . Interpret one or more of the explosive magazines 4.2.2

Medium Priority (continued)

- . Seek sponsorship support for explosive magazine conservation if lessee is not found 4.2.2
- . Implement bullock track conservation plan 4.2.2
- . Establish visitor information display near Roseville Bridge boat ramps and in Davidson Picnic Area 4.3.1
- . Erect park signs at boundaries 4.3.1
- . Erect explosive magazine interpretive sign on eastern side of Bantry Bay 4.3.1
- . Erect information sign on bullock track 4.3.1
- . Plant shade trees in Davidson Picnic Area 4.3.2
- . Provide toilets near boat ramps 4.3.2
- . Replace wood barbecues with gas/electric barbecues 4.3.2
- . Prepare list of research topics 4.3.3
- . Develop MOU with Sydney Water 4.3.4

Low Priority

- . Develop water quality education programme 4.1.1
- . Develop fire education programme 4.1.4
- . Prepare and implement interpretation programme for the explosive magazines 4.3.1
- . Develop interpreted nature walk on Casuarina Track 4.3.2
- . Link Cook Street and Bay tracks 4.3.2
- . Construct track links along Bare Creek 4.3.2
- . Develop walking track system in Narrabeen Lakes area including possible track head 4.3.2
- . Provide track-head parking 4.3.2

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